



City of Aberdeen

Water System Plan

March 2021

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- N. KI&A Aberdeen Water Outlook
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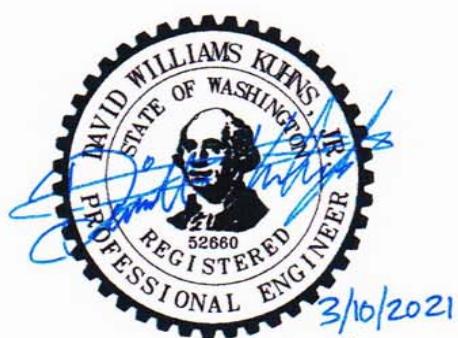
Certificates of Engineers

City of Aberdeen Water System Plan

The material and data contained in this report were prepared under the direction and supervision of the undersigned, whose seals as professional engineers, licensed to practice in the State of Washington, are affixed below.



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1. Description of Water System

1.1 Ownership and Management

The City of Aberdeen (City) owns and operates its domestic water system serving customers within its City limits, the nearby community of Cosmopolis, and adjacent areas within Grays Harbor County (County). The City's Water Facilities Inventory (WFI) is included in Appendix A. The City uses a Mayor/City Council form of government. Elected positions include those for the Mayor and each of the twelve Council members. Each of the following administrative departments is filled by appointment: Public Works, Police, Fire, Parks and Recreation, Finance, Legal, and Planning/Development. Department heads report directly to the Mayor. Of these, the Public Works Department has responsibility for the management and operation of the City's water system.

The Public Works Department, located at City Hall, is headed by the Director of Public Works. Responsibilities of this position include overall management of all water, wastewater, transportation, and engineering services including implementation of City policy.

The Public Works O&M Manager, under the direction of the Public Works Director, organizes and administers the day-to-day operations and maintenance of the water system. The City Engineer, under the direction of the Public Works Director, provides for planning and capital construction within the system.

1.2 System Background and History

The first city-owned water system in Aberdeen was established in 1892 and built around a number of small private systems, utilizing Stewart Creek as its source. In 1918, the Wishkah Gravity Water System was completed, providing the City with adequate supply for the central Aberdeen area as well as north and south Aberdeen. Storage for the system was the Fairview Reservoir No. 1 with 9.5 million gallons (MG) capacity, built in 1915. Fairview Reservoir No. 2, providing 15.5 MG of storage, was constructed in 1925.

In 1961, a conventional mass concrete dam was constructed at the Wishkah headworks, creating 120 acre-feet of storage. In the mid-1960s a 22-mile, 28-inch diameter steel and concrete cylinder pipe transmission main was installed between the headworks and the Fairview reservoirs, replacing the original wood stave transmission main which was subsequently abandoned.

During the 1970s and 1980s additional storage tanks were added to service the upper pressure zone and south Aberdeen.

City crews constructed the majority of the water distribution system as development occurred. Although some pipelines, especially the river crossings, have been upgraded, the majority of the distribution piping is at least 70 years old.

Since 2000, there were significant upgrades to the City's water system. In June 2000, a microfiltration plant came online to provide treatment for the City's water supply. In November 2002, a project to install liners and covers on the Fairview Reservoirs was completed. The City began a program to install customer meters throughout its system which was completed in 2010. The first meter based bills were issued in March 2004.

The filter life at the microfiltration plant has been observed to be five years on average. The lifetime cost of the filter plant due to the cost of filter replacement is a concern for the City.

1.3 Service Area

1.3.1 General

The City's boundaries are bisected by the confluence of the Chehalis River and the tidally influenced Grays Harbor Estuary in southwestern Washington. The community, located approximately 25 miles east of the Pacific Ocean is centered between the Cities of Hoquiam and Cosmopolis.

The Wishkah River flows into Grays Harbor from the north through the east central portion of Aberdeen. This creates three separate developed City areas fronting on the Chehalis, Grays Harbor, and Wishkah watercourses. The City is accessed from the east by U.S. Highway 12 and the Puget Sound and Pacific Railroad.

Due to its proximity to the ocean and the prevailing westerly wind, the community has a mild, cool climate, recording a mean annual temperature of 50 degrees Fahrenheit while receiving an average annual precipitation of 83 inches. The City's topography is representative of a tidal river flood plain where the contours vary from wide tidal flats to gentle slopes upland of the river channels where they meet bordering hills that rise at steep slopes to an elevation of 400 feet above sea level.

The City shares its western water service area boundary with the City of Hoquiam, and a portion of its southeastern boundary with the City of Cosmopolis. The economic base for the Grays Harbor area has historically been based on the timber, fishing, and manufacturing industries. While those industries are still important, the economy has diversified to include exports at the Port of Grays Harbor, a biodiesel refinery, and tourism.

1.3.2 Service Area Policies and Duty to Serve

The City's water system policies and regulations are included in Chapter 13.56 and 13.60 of the Aberdeen Municipal Code, which is included in Appendix B, and also found at the following internet address.

aberdeen.municipal.codes/AMC

Aberdeen provides water service to properties abutting a water main, upon acceptance of an application and payment of a deposit from the property owner. Properties not abutting a City water main may receive service, provided an application is accepted and services lines from the main to the property are installed and maintained by the property owner.

Service may be provided outside of City Limits. Application and connection procedures are the same as stated above.

The City has a duty to serve all new connections located within its Retail Service Area, so long as the following four threshold factors are met, as described in WAC 246-290-106:

- The City has sufficient capacity to provide water in a safe and reliable manner.
- The service request is consistent with the City's adopted plans and development regulations.
- The City has sufficient water rights to provide service.
- The City can provide service in a timely and reasonable manner.

1.3.3 Retail Service Area

The City's Retail Service Area is shown in Figure 1-1. The Retail Service Area lies within the corporate City limits of Aberdeen with the exception of some water service provided in unincorporated areas of the County. According to water account records, the number of services outside the City are: 13 services in Junction City, which lies east of the City and 294 services are provided in the Wishkah Valley along the 28-inch diameter potable water transmission main to the north of the City. The Bishop Field Complex is served by the transmission main to SCCC. A group of homes outside of the City Limits on Bigelow Drive are served by a private pump station and the City read a master meter for these services. There is also a group of homes east of the City along Hwy 12 served by a single 2-inch waterline connected to the City's System. These portions of the retail service area are shown in Appendix C.

The City supplies water to Cosmopolis as a wholesale customer, and Cosmopolis meters and bills the individual customers beyond the City's point of service. The Stafford Creek Correctional Center (SCCC) which has an inmate population capacity of 1,936, is also served as a wholesale customer.

Up until 2020, the City had not been charging for metered use of water by all City-owned facilities and departments. Starting in 2021, all City department will be responsible for paying for metered water use to ensure a self-funded Water Utility.

No other water systems are located within the City service area.

City policy and available land resources encourage additional connections to the system to occur within the City Limits and along the potable water transmission main. One exception occurs with the property owned by the City that includes Aberdeen Lake. This land is currently used for harvesting timber and the City will not provide water service in the future.

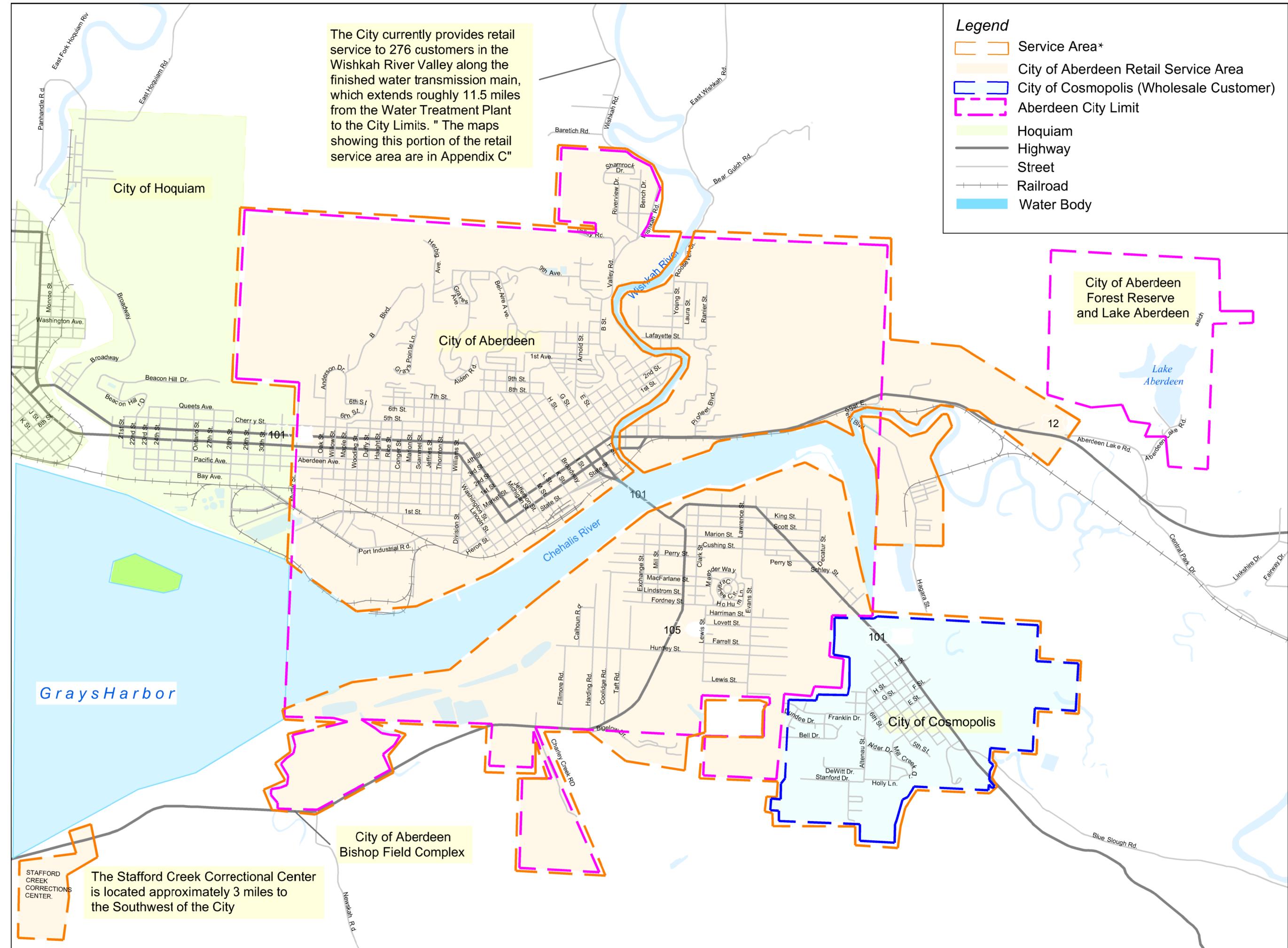
Additional development in Cosmopolis will increase the amount of water used by this wholesale customer. The City has an abundant supply of water and will continue to support increases in development and provide water service.

1.4 Adjacent Purveyors

The service areas of three other water purveyors abut the City's Retail Service Area: the City of Hoquiam to the west, the City of Cosmopolis to the south, and Central Park to the east.

The City's water system has interties with the Hoquiam water system and the Cosmopolis water system at four locations. The Hoquiam interties are located near the intersection of Aberdeen Avenue and Myrtle Street and near the Industrial Road and Murphy Street intersection. The City has a formal written interlocal agreement with the City of Hoquiam to supply water during emergency situations. A copy of this agreement is included in Appendix B.

One of the Cosmopolis interties is located near H and 5th Streets and the other is on Southwest Boulevard at its intersection with Tyler Street. The City has a formal agreement to provide a supply of potable water to the City of Cosmopolis. Cosmopolis relies upon the City exclusively for its potable water.



The City coordinated planning efforts with adjacent purveyors during this Water System Plan process. Documentation of this coordination is included in Appendix C. The City also participates in the WRIA 22/23 Chehalis Basin Watershed Plan process.

1.5 Inventory of Existing Facilities

Key water system facilities and pressure zones are shown in Figure 1-2. A hydraulic schematic of the system is provided in Figure 1-3, which shows the hydraulic relationship among pressure zones, reservoirs, pump stations, and PRVs.

1.5.1 Transmission System

Water drawn from the Wishkah River source is delivered to the Aberdeen Water Treatment Plant via a 10-mile gravity transmission main. The 28-inch diameter gravity main starts at Malinowski Dam and runs almost due south or southwesterly along the Wishkah River valley. Once treated, water can travel to two different sections of the distribution system. Most of the water is returned to the transmission main and continues another 11.5 miles en route to its terminus at the Fairview reservoirs (See Figure 1-4). The Fairview reservoirs are the primary finished water supply reservoirs for the City. The rest of the treated water is stored in a tank at the treatment plant. A separate distribution main drawing water from the tank at the treatment plant serves 22 customers in the upper Wishkah Valley area.

The original wood stave transmission main was constructed in 1916. It was replaced twice with piping of similar construction, which served the City until the entire main was replaced with steel and concrete pipe in the early 1960s.

The present pipeline was constructed in three phases along the same general route as the original line. Phase I begins at the Wishkah headworks and was installed in 1958 using tar-coated pipe constructed of $\frac{1}{4}$ -inch thick steel. The remainder was constructed of concrete cylinder pipe, specified to meet federal specification SS-P-381, and was installed between 1961 and 1963. The alignment, elevations, pipe lengths, materials, and year of construction for each section of pipe are shown on the drawing depicted in Figure 1-4. The capacity of the pipeline is 7.5 mgd based on the hydraulic gradients shown on Figure 1-4.

According to City Water Department staff, both steel and concrete sections of the main are in good condition, requiring low maintenance. The largest maintenance issue is when ground movement causes joint failures. Air valves, observation manholes, and blow-offs were installed during construction. However, the transmission main has no in-line valves to isolate sections or control flow, except at the headworks, the terminal reservoir, and the treatment plant. At the headworks either of two valves can be used for throttling flow to achieve the desired flow rate. One valve is a control valve that automatically shuts down during high turbidity events. Both valves can be operated remotely from the treatment plant or manually.

1.5.2 Treatment Facilities

The City's membrane filtration plant began serving customers in June 2000. Raw water is delivered from the Wishkah River by the 10 mile, 28-inch transmission line. At the plant, water is filtered by eight membrane microfiltration modules, chlorinated using chlorine gas, held in a clearwell to obtain adequate disinfection contact time, and then adjusted for corrosion control with the addition of caustic soda. Fluoride is applied at the outlet of the treatment plant. The finished water is then either returned to the transmission main or pumped to the Wishkah tank for distribution to customers along Wishkah River Road. Figure 1-5 is a schematic of the City's membrane filtration plant system. One full-time employee is needed to operate the treatment facility.

The fully automated treatment plant has a rated filtration capacity of 6.5 mgd and contains a total filter surface area of more than 116,000 square feet. The filtration system includes a compressed air system for filter backwashing, a chemical feed system for periodic cleaning of the membranes, and an automatic membrane integrity testing system. A backup 150-200 hp diesel generator, capable of supplying power to all treatment plant auxiliary systems, is located on-site and automatically starts in the event of a power failure. The filtration system also has an uninterrupted power supply source that can power the plant long enough for proper shutdown procedures in the event of generator failure.

Chlorine is added to filtered water prior to its entry into the 310,000 gallon clearwell. The chlorination system consists of two 1-ton gas cylinders with automatic flow-paced control. Each gas cylinder is enclosed in a secondary vessel to provide for physical containment in the event of a gas leak. Sodium hydroxide is added to the last clearwell chamber to reduce lead and copper levels at the customers' taps by increasing the water pH. Fluoride is added to the finished water using a saturator to enhance customer dental health.

A new disinfection system utilizing onsite generation of bulk sodium hypochlorite is anticipated to be constructed in 2021. The existing chlorine gas-based system will be decommissioned and removed.

The City built settling ponds to discard backwash water off site. Backwash water is conveyed into two sequential settling basins that overflow into an infiltration pond. Any water that does not infiltrate will overflow into the headworks of a small creek adjacent to the property. The City acquired an NPDES permit for this discharge. Twice per year, sludge from the settling basins is pumped into a separate drying basin located on site.

The entire treatment facility is surrounded by a fence, and is gated and locked. All entrances are equipped with intrusion alarms, and the building has heat and smoke detectors. In the event of a source water quality emergency, valves at the intake can be shut-down automatically or manually from the treatment plant. The treatment plant can be bypassed in the event of a facility-related water quality emergency.

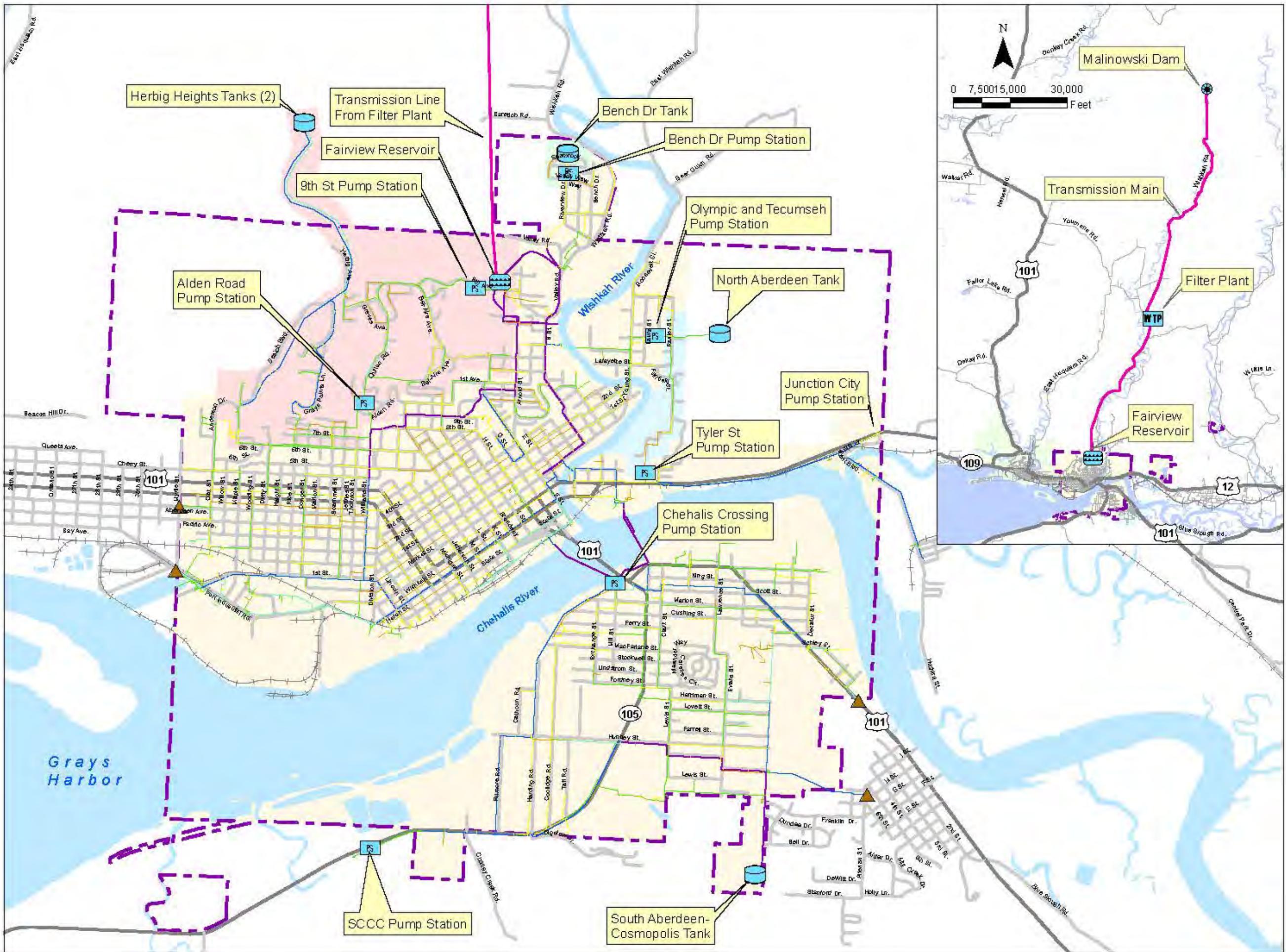
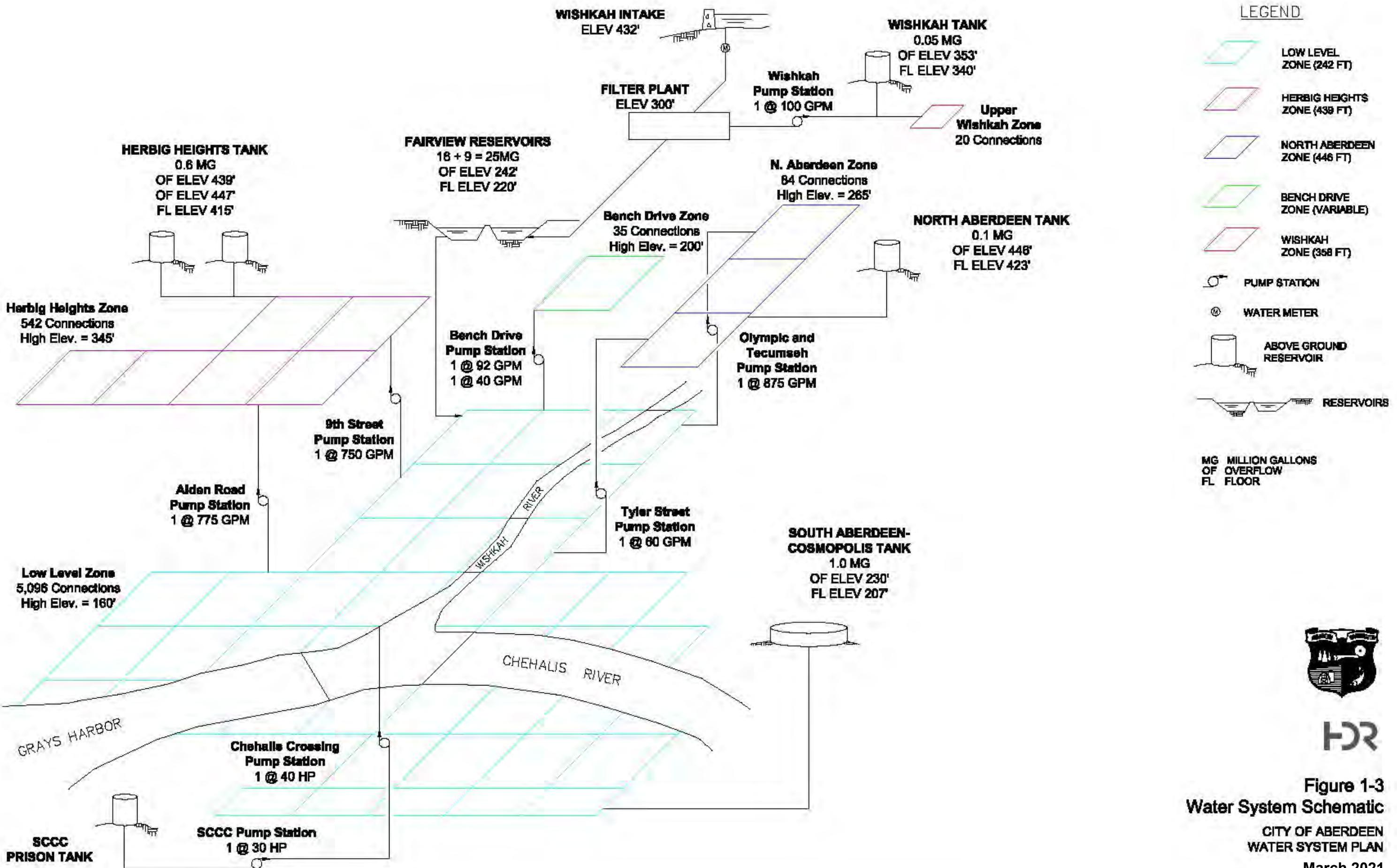
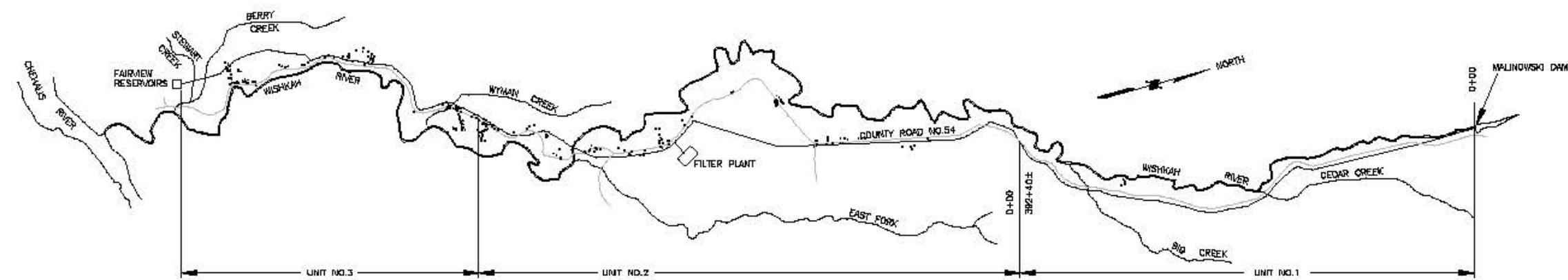
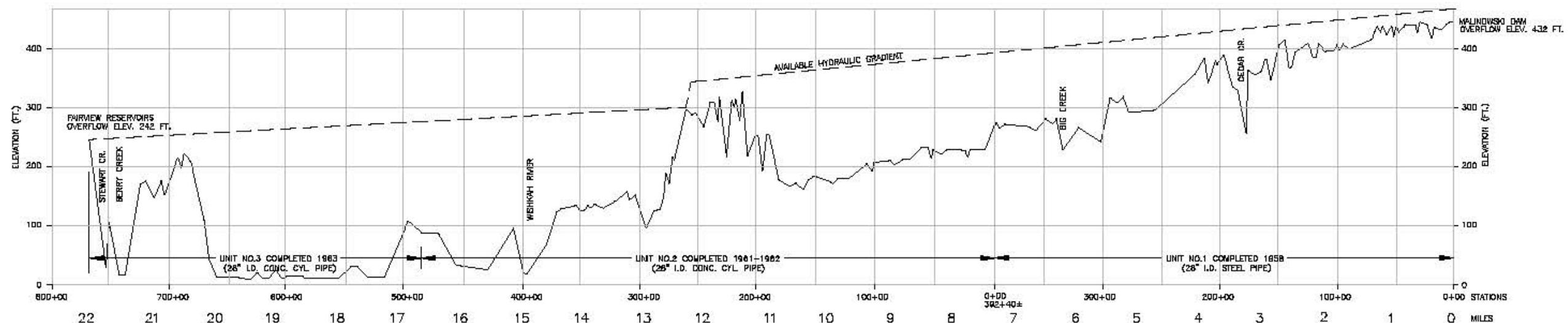


Figure 1-2
Water System Map
CITY OF ABERDEEN
WATER SYSTEM PLAN
March 2021



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Figure 1-4
Gravity Transmission Line
CITY OF ABERDEEN
WATER SYSTEM PLAN
March 2021

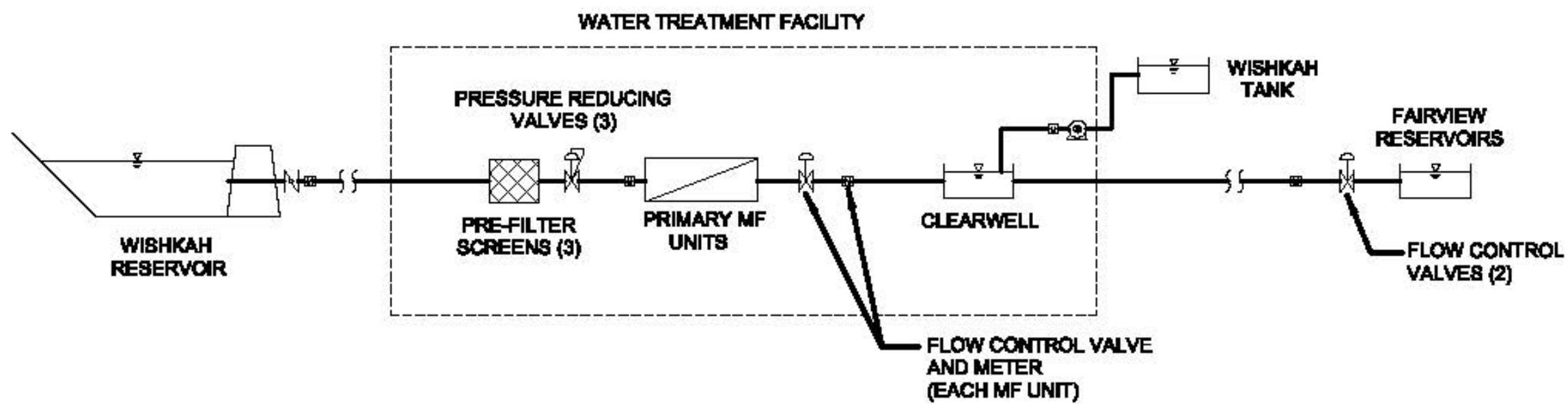


Figure 1-5
Filter Plant Schematic
CITY OF ABERDEEN
WATER SYSTEM PLAN
March 2021

HDR



1.5.3 Finished Water Storage Facilities

The City currently has seven storage reservoirs with a combined capacity of over 27 million gallons (MG). Figure 1-3 shows the elevations and volume of each reservoir, as well as its schematic relationship to other components of the water system. Reservoir characteristics are also described below and summarized in Table 1-1. Elevations are according to Aberdeen City Datum (i.e., equal to NVGD 1929 Datum + 4.78 feet).

Table 1-1. Description of Gravity Storage Facilities

	Fairview 1	Fairview 2	Herbig Heights 1	Herbig Heights 2	North Aberdeen	South Aberdeen	Wishkah Tank
Capacity	9,500,000	15,500,000	250,000	350,000	100,000	1,000,000	50,000
Elevations (ft)							
Overflow	242	242	439	447	446	230	353
Floor	220	220	415	415	423	207	340
Dimensions (ft)							
Plan	200 x 220	450 x 240	43 diameter	43 diameter	28 diameter	85 diameter	26 diameter
Height	22	22	24	32	23	23	15
Year Constructed	1914	1926	1996	1996	1990	1996	2000
Enclosed/covered	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Site Fenced	Yes	Yes	No	No	No	No	Yes
Pressure Zone Served	Lower Aberdeen	Lower Aberdeen	Herbig Heights	Herbig Heights	N. Aberdeen	S. Aberdeen	Wishkah Valley

Fairview Reservoirs

Two reservoirs, located on Fairview Hill, are the key storage facilities of the City water system. The gravity transmission main feeds water into a metered piping network that can divert the water to either reservoir. Water is drawn from the reservoirs and enters the distribution system of the lower Aberdeen pressure zone through one of three mains, which are 16-inch, 20-inch, and 24-inch in diameter. Another 16-inch diameter line is used to remove overflow and enables the City to drain either reservoir for maintenance purposes.

Constructed in 1914, the Fairview Reservoir No. 1 is a rectangular structure with a capacity of 9.5 MG. The inlet pipe connected to the weir box is located near its western edge. Outlets are 16 inches and 20 inches in diameter and located at the southeast and northeast corners, respectively. The embankment along the north side of the reservoir has a history of slope failures. Records indicate that the first evidence of instability occurred as early as 1920 and a drainage system was installed within the embankment. The most recent occurrence was in 1976 when the slope slumped, causing several concrete panels and the parapet wall along the affected area to drop approximately 8 inches. This failure was investigated and an earth buttress was constructed at the toe of the slope to provide stability.

Constructed in 1926, Fairview Reservoir No. 2 measures 450 feet long by 240 feet wide with a capacity of 15.5 MG and is located to the west of Reservoir No. 1. Each reservoir is connected with a 16 inch feed line from the transmission main.

Both reservoirs were lined and covered in 2002. The lines and covers are anticipated to be replaced over a period of two years starting in either 2021 or 2022 depending on construction financing.

Herbig Heights Tanks

The Herbig Heights tanks, located north of the City Limits, serve the Herbig Heights pressure zone. The floats in the tanks are connected to a radio transmitter, which then signals water level information to two booster pumping stations on 96th Street and Alden Road. High and low level alarms transmit to the Water Department shop.

The first Herbig Heights tank is a 24-foot tall by 43-foot diameter steel structure. Elevations of the overflow pipe and tank floor are 439 and 415 feet above mean sea level, respectively. Total tank capacity is 250,000 gallons.

The second Herbig Heights tank is a 32-foot tall by 43-foot diameter steel structure. Elevations of the overflow pipe and tank floor are 447 and 415 feet above mean sea level, respectively. Total tank capacity is 350,000 gallons. The usable tank volume is 250,000 gallons because the top 8 feet in this tank is unusable as it is above the overflow elevation of the Herbig Heights tank 1.

North Aberdeen Tank

The North Aberdeen tank, located west of the intersection at Pearson and Tecumseh, is a 28-foot diameter by 23-foot tall welded steel tank serving the north Aberdeen pressure zone. The floor elevation is 423 feet and overflow occurs when water reaches the 446-foot level. Floats in the tank are connected to a radio transmitter which signals water level information to the booster pumping station at Tecumseh and Olympic. High and low level alarms transmit to the Water Department shop. Total tank capacity is 100,000 gallons. The Tyler Street pump station also serves this tank.

Wishkah Tank

The Wishkah Tank is a 26-foot diameter by 15-foot tall steel tank located on the premises of the Aberdeen Water Filtration Plant. Elevations of the overflow pipe and tank floor are 353 feet and 340 feet above mean sea level, respectively. The tank serves the Wishkah valley customers upstream of the treatment plant, which were previously served by the transmission main from the Wishkah River. Booster pumps at the treatment plant maintain tank levels. The total tank capacity is 50,000 gallons.

South Aberdeen-Cosmopolis Tank

The south Aberdeen-Cosmopolis tank, located south of the City Limits off of Farragut Street, in the lower Aberdeen pressure zone, is an 85-foot diameter by 23-foot high welded steel tank. The tank enables the City to provide peak demands to customers in south Aberdeen and supplies customers of Cosmopolis. The elevations of the overflow pipe and tank floors are 230 and 207 feet above mean sea level, respectively. It is a 1,000,000 gallon capacity tank that fills

by gravity from Fairview reservoirs. Since its overflow is 14 feet lower than that of Fairview reservoirs, an altitude valve is used to limit the maximum water level at 228 feet.

Bench Drive Pressure Tank

A horizontal hydro pneumatic tank measuring 5 feet in diameter by over 12 feet long serves the Bench Drive pressure zone with 35 residential connections. Fabricated of carbon steel with an epoxy coating on the interior, the tank is filled from the nearby booster pumping station on

Shamrock Drive. The pumping operations are controlled on an automatic basis by signals from water level sensors in the tank. Pump settings are presently set at the following levels:

Depth (In.)

- Both Pumps off 24"
- Small Pump on 18"
- Large Pump on 17"

The level sensors are directly connected to pump starters and there are no alarms on this system.

This existing pressure tank and pump are planned to be replaced in 2021.

Stafford Creek Correctional Center

The City supplies water to the Stafford Creek Correctional Center (SCCC) located west of the City Limits. The SCCC operates and maintains a 1.6 MG finished water storage tank at the facility for water supply. The City owns the transmission line and pump station that feed the SCCC tank. Tank levels are maintained by a booster pumping station located approximately three miles east of the correctional facility.

1.5.4 Pumping Stations

The City has eight booster pump stations. These are necessary to boost water from the lower Aberdeen pressure zone to outlying zones that are too high in elevation for adequate gravity pressure from the Fairview reservoirs. Pertinent characteristics of the City's booster pump stations are described below.

9th Avenue Pump Station

The 9th Avenue station, located near the Fairview reservoirs, is the primary pumping facility for the Herbig Heights pressure zone and contains a 60 hp centrifugal pump with a capacity of 750 gpm. The pump is automatically activated by a signal from the water level sensor in the Herbig Heights tanks. The 9th Avenue pump station is equipped with a control valve, which slowly opens when the pump comes on to avoid pressure surges. This pump station is scheduled to be upgraded to VFD pumps in 2021.

Alden Road Pump Station

Should the 9th Street pump fail, a 75 hp backup pump with a capacity of 775 gpm at the booster station on Alden Road actuates automatically according to a radio signal from the Herbig Heights tanks. The pump station is equipped with a control valve, which slowly opens when the pump comes on to avoid pressure surges. This pump station is scheduled to be upgraded to VFD pumps in 2021.

Olympia and Tecumseh Pump Station

The Olympic and Tecumseh station, located north of the City Limits, serves the north Aberdeen pressure zone and is equipped with a 100 hp centrifugal pump with a capacity of 875 gpm that is started and stopped automatically according to a radio signal from north Aberdeen tank.

Tyler Street Pump Station

The Tyler Street station is used to serve the north Aberdeen pressure zone when the Olympic and Tecumseh station is not operational. It has a 15 hp pump with a capacity of 60 gpm which is not adequate to meet water demand on a sustainable basis. Currently, the Tyler Street station pump is offline and must be started manually.

Bench Drive Pump Station

The Bench Drive station, located at Shamrock Drive, serves a small, residential area referred to as the Bench Drive pressure zone. Two pumps are contained within the pump station with a capacity of 40 gpm for the first call pump and 92 gpm for the second call pump. The two pumps are controlled by the water level in the Bench Drive pressure tank.

This station will be decommissioned and removed after the construction of a new Bench Drive Pump Station which is planned in 2021. The new station will include VFD pumps and a pressure tank integrated into a single facility.

Chehalis Crossing Pump Station

The Chehalis Crossing station is located near the Chehalis Bridge south Aberdeen. The pump station is used only in emergency situation like a major main break in the South Aberdeen area.

SCCC Pump Station

The SCCC pump station is used to convey water to the SCCC tank. It is located approximately three miles southwest along the correctional facility transmission main from the Chehalis Crossing pump station. The 30 hp pump is operated automatically according to water level signals from the correctional facility tank.

Wishkah Pump Station

The Wishkah pump station serves a small pressure zone north of the Aberdeen filtration plant. A 3 hp pump, located at the filtration plant, provides finished water from the treatment plant, to the

Wishkah Valley customers via the Wishkah tank, also located at the treatment plant. The pump is started and stopped automatically according to radio signals from the Wishkah tank.

1.5.5 Distribution System

The City's distribution system is a looped network of piping and appurtenances designed to deliver a reliable supply of water at adequate pressure to meet customer and fire fighting needs. The City's distribution system has approximately 119 miles of waterline. Table 1-2 below lists the total length of waterlines in the distribution system. Figure 1-2 shows the existing distribution network.

Table 1-2. Distribution Network

Diameter (in)	Total Length (ft)	Percent (%)
<4	157,621	25.1%
4	57,265	9.1%
6	161,180	25.7%
8	115,521	18.4%
10	28,461	4.5%
12	72,539	11.6%
14	12,085	1.9%
16	21,605	3.4%
20	1,166	0.2%
24	460	0.1%
Total	627,904	

1.5.6 Pressure Zones

The City water service area supplies potable water for commercial and residential customers, located for the most part on the Chehalis River flood plain at an elevation of approximately 20 feet. The City also extends service to customers in several adjacent residential highland areas. Due to the location of the potable water source, the configuration of system components, and topography within the City's Retail Service Area, the distribution system is divided into six pressure zones.

Table 1-3 lists the pressure zones. The description of the pressure zones follows.

Table 1-3. Pressure Zone Boundaries

Zone	Pressure Source	Maximum Elevation
Low Level	Fairview Hill Reservoirs	242 ft.
Herbig Heights	9 th Ave and Alden Rd Pump Station	439 ft.
North Aberdeen	Olympic Street Pump Stations	446 ft.
Bench Drive	Fairview Hill Reservoirs	Variable
Upper Wishkah	Wishkah Tank	353 ft.
Lower Wishkah	Treatment Plant Clearwell	300 ft

The City Water Department maintains four pressure reducing valves (PRVs) to reduce pressures in localized areas. Two are located in the north Aberdeen pressure zone at either end of a 2-inch diameter line along Fairview Street between Clinton and Sherman. The other two are in the Herbig Heights pressure zone. They reduce water pressure in two dead-end, 2-inch diameter pipes adjacent to the Fairview reservoirs.

Low Level

This zone covers most of the City's total service area, including the tidal flats and lower hillsides. The zone serves 5,216 of the City's 6,020 residential and commercial customers, from two concrete-lined reservoirs located adjacent to one another (elevation 247) on Fairview Hill in north Aberdeen. Topography ranges from 20 feet to 220 feet above mean sea level. In addition, water is pumped from the low level zone into each of the higher pressure zones.

Herbig Heights

This zone is located in northwestern Aberdeen and serves 560 residential and commercial customers as well as Grays Harbor Community Hospital. The zone, consisting of the more recent residential developments, is located in the rolling highlands area and is bordered on the north by undeveloped land. The topography of this tract of the City is replete with hills and draws. Ground elevations vary between 40 feet and 345 feet above mean sea level. Two pump stations that draw from the low level zone pressurize the zone. Pressures within the Herbig Heights zone reach as high as 130 pounds per square inch (psi) in some locations. As a result, a number of service connections have pressure-reducing valves installed.

North Aberdeen

This zone serves a small, higher elevation residential area east of the Wishkah River with 91 connections. The zone is bounded roughly by: Olympic Street to the west, Mitchell Street to the north, to the east the City Limits, and Henry Street to the south. A pump station near the intersection of Olympic Street and Tecumseh Street pressurizes the north Aberdeen zone.

Another backup pump station, located at Tyler Street, north of Wishkah Boulevard, can be utilized should the Olympic Street station fail. The Olympic Street pump station draws water from the low level zone and boosts the pressure to supply the north Aberdeen zone as well as fill a 100,000 gallon ground level reservoir.

Bench Drive

This zone serves a small residential area in the northern most extreme of the low level zone. There are 47 service connections served by a pressure tank and the Bench Drive pump. The zone is situated in an upland area where ground contours range between 120 feet to 200 feet above mean sea level.

Upper Wishkah

This zone serves 22 customers near the treatment plant. The Wishkah pump station supplies the zone from the treatment plant clearwell. The pump station fills the Wishkah Tank which provides storage for the zone.

Lower Wishkah

This zone serves 272 residential connections that are supplied by the transmission main between the treatment plant and the Fairview Reservoirs. The zone is supplied by gravity from the Treatment Plant Clearwell.

Other Pressure Zones

In addition to the pressure zones described above, service to two additional zones is provided: Cosmopolis and SCCC.

The City's system provides water to the City of Cosmopolis from the Fairview reservoirs and Chehalis Crossing Pump Station. The south Aberdeen-Cosmopolis reservoir enables the City to provide peak demands to customers in south Aberdeen and supplies customers of Cosmopolis. Since the overflow elevation of the south Aberdeen-Cosmopolis reservoir is 14 feet lower than that of the Fairview reservoirs, an altitude valve is used to limit the maximum water level.

The City also supplies water to the SCCC. SCCC operates and maintains its own storage tank for water supply to the facility. The City owns the transmission line and pump station that feed the SCCC tank.

1.5.7 Interties

The City of Aberdeen has two emergency interties with the City of Hoquiam. There is an 8-inch connection at Myrtle Street and Aberdeen Avenue and a 10-inch connection at the intersection of Port Industrial Road and 1st Avenue. The Port Industrial Road Intertie includes a 500 gpm booster pump station that is owed and operated by the City of Aberdeen. Starting this pump requires both Hoquiam and Aberdeen staff, due to issues with bleeding air in the connection pipes and flushing water from the stagnant pipes. A copy of the City's Intertie Agreement is included in Appendix B.

The City has four interties with the City of Cosmopolis. Each intertie is metered. The following is a list of the meter size and location of each intertie.

- 6" meter on SW 101.
- 8" and 4" meter on Holman Street and Farragut Street
- 10" meter on Stanford Drive
- 6" and 1 ½" meter in the Bell Addition of Cosmopolis

1.5.8 Industrial Water System

The City of Aberdeen owns and operates the Wynoochee Industrial Water System with management responsibilities shared with Grays Harbor County. The Industrial Water System provides a source of non-potable water supply to industrial facilities in Aberdeen, Cosmopolis, and Hoquiam, with the potential to serve other sites in the vicinity. The water is diverted from the Wynoochee River, conveyed through a tunnel to Lake Aberdeen, and then is fed by gravity (the Hoquiam pipeline has an inactive pump station at Lake Aberdeen) into two transmission lines leading to customer sites in Cosmopolis and Hoquiam.

The industrial water system has two main segments of pipeline: one running from Lake Aberdeen southwest to a pulp mill in Cosmopolis and one running from Lake Aberdeen west to a terminus near the Hoquiam River where a major paper mill customer was formerly located. The only customer on the Cosmopolis segment is the pulp mill (Cosmo Specialty Fibers). The Hoquiam segment, which is a 7-mile, 48-inch diameter pipeline with 16 MGD capacity passing through downtown Aberdeen and the Port of Grays Harbor, currently serves a lumber mill in Junction City (Sierra Pacific) and the Port of Grays Harbor.

The Industrial Water System is not connected to the City's potable distribution system and is not being reviewed in this Water System Plan update. However, this source does affect the potential demand on the existing distribution system as new industry develops in the City. It is assumed any large scale industrial development will be served by the Industrial Water System.

2. Related Plans and Agreements

2.1 Related Plans

Several plans and studies were reviewed and considered during the update of this Water System Plan (WSP). These are:

- *City of Aberdeen Comprehensive Plan, 2001*
- *Chehalis Basin Watershed Management Plan, 2004*
- *City of Cosmopolis Water System Plan, 2005*
- *City of Hoquiam Water System Plan, 2012*

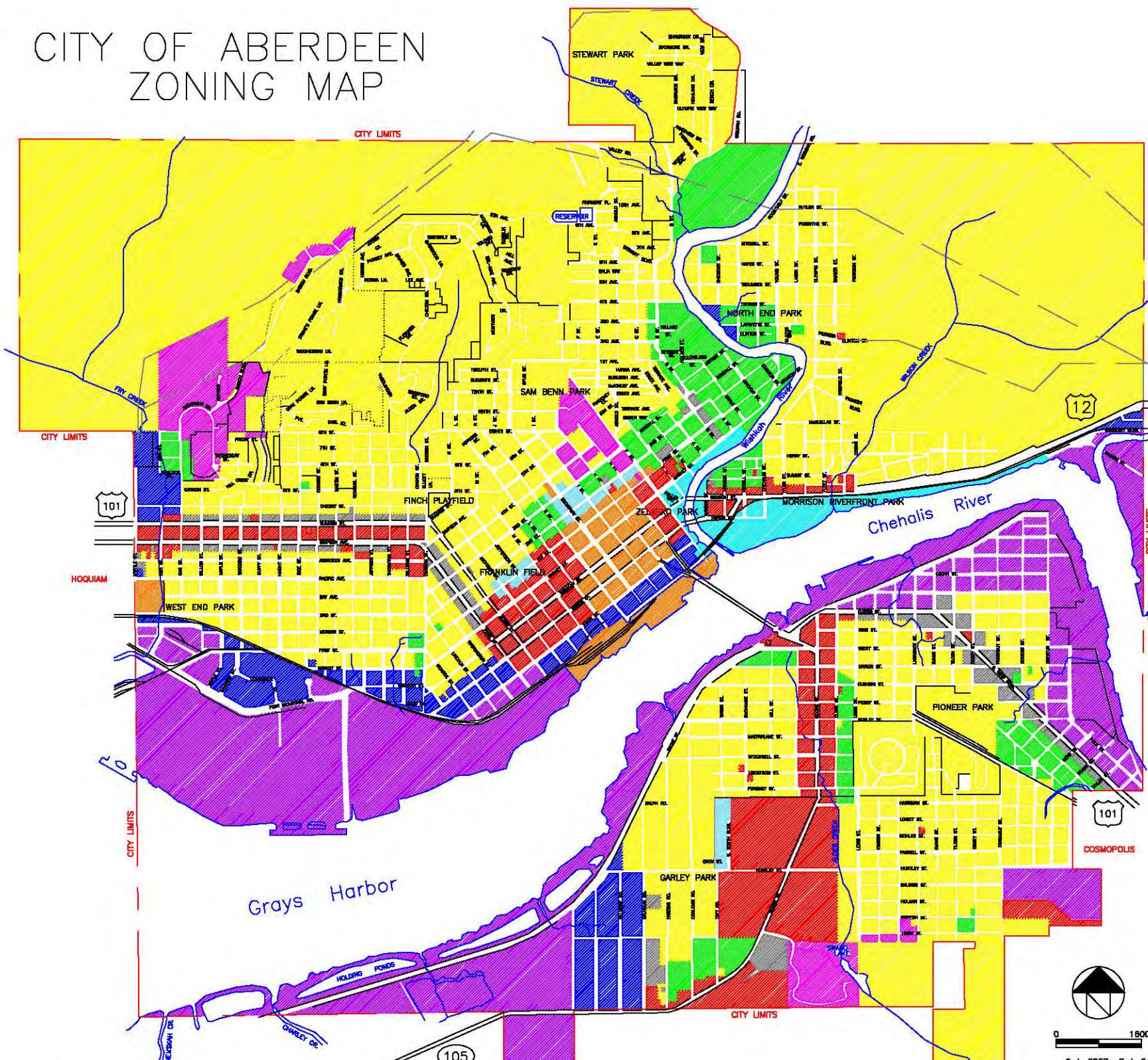
2.2 Service Area Agreements

The City does not have signed service area agreements with adjacent water systems because the existing infrastructure for the City's system and adjacent systems currently abut, not allowing for expansion (Central Park to the east, Cosmopolis to the south, and Hoquiam to the west). The City provides wholesale water to Cosmopolis and has an existing intertie with Hoquiam, so these agreements exist and coordination occurs with these systems. The area of expansion for the City's system will be within City Limits, as described in Chapter 1. Grays Harbor County has reviewed the City's service area and provided the water system plan program consistency statement in Appendix D. The City does not intend to pursue formal service area agreements with adjacent water systems.

2.3 Zoning

City zoning is shown in Figure 2-1. Zoning outside of the City Limits along the water transmission main is primarily General Development (G-5) or Agricultural (A-1) with some areas that are zoned as Residential (R-2). The Land use along the water transmission main is primarily forestry and residential with some areas of unimproved and public land use.

CITY OF ABERDEEN ZONING MAP



LEGEND:

RS SINGLE FAMILY RESIDENTIAL	CG GENERAL COMMERCIAL
RM MULTIPLE FAMILY RESIDENTIAL	MI MAJOR INSTITUTIONAL
RP RESIDENTIAL PROFESSIONAL	LI LIGHT INDUSTRIAL
CR COMMERCIAL/RESIDENTIAL	I INDUSTRIAL
CD DOWNTOWN COMMERCIAL	WD WATERFRONT DEVELOPMENT



Ord. 6057 Ord. 6458
Ord. 6079 Ord. 6542
Ord. 6088 Ord. 6557
Ord. 6090 Ord. 6577
Ord. 6111
Ord. 6119
Ord. 6136
Ord. 6218
Ord. 6219
Ord. 6377
Ord. 6380
Ord. 6387
Ord. 6388
Ord. 6398
Ord. 6400
Ord. 6432
Ord. 6441
Ord. 6447
Ord. 6451

3. Water Demand Forecast

Water demand projections help identify the magnitude of supply and infrastructure improvements needed by a water utility. The City of Aberdeen's (City) long-term quantity of water available, water rights, treatment plant and transmission pipeline capacity all need to support the City's long-term water demand. The quantity of water needed depends on potential residential, commercial, and industrial growth.

The forecast sets 2020 as the base planning year, 2030 as the 10-Year planning period, and 2040 as the 20-Year planning period.

3.1 Water Production

The City obtains its municipal water supply from the Wishkah River. Surface water is impounded by the Malinowski Dam, diverted to the Water Treatment Plant (WTP), and then routed to the distribution system. There are two interties with the City of Hoquiam for emergency use.

The total monthly water volume produced at the WTP for 2011-2019 is presented in Table 3-1, based upon the master meter records at the treatment plant. The most recent data shows total system production was approximately 997 million gallons (MG) in 2019. Figure 3-1 provides a monthly comparison of production for 2011 to 2019.

The trend over the past 10 years has been generally steady production, with a minor increase in the most recent three years. However, these recent values are lower than demands described prior to 2011, which were regularly above one billion gallons per year. Each successive year exhibits some variability in production; however, steady production is the average trend.

Table 3-1. Monthly Water Production (2011 – 2019)

	Monthly Production (MG)								
	2011	2012	2013	2014	2015	2016	2017	2018	2019
January	80.6	72.5	79.7	81.5	80.3	77.2	83.3	79.0	81.7
February	70.8	69.0	65.8	72.5	70.6	69.0	69.4	73.6	71.3
March	77.2	73.5	71.9	72.5	76.0	73.2	77.3	78.0	78.1
April	77.2	70.5	69.0	69.3	71.4	70.8	75.6	72.2	77.4
May	80.0	75.0	75.3	76.9	77.5	81.0	81.8	79.5	89.3
June	81.0	71.7	72.9	87.6	92.1	80.1	82.6	84.8	90.0
July	88.6	76.3	86.8	92.4	95.2	87.6	99.0	92.3	99.7
August	92.7	88.0	94.2	93.3	90.2	98.1	96.0	94.7	97.7
September	87.9	84.0	78.6	80.4	78.0	77.7	86.4	86.2	81.6
October	78.7	79.0	78.1	75.0	77.2	77.0	82.8	85.0	81.4
November	72.6	77.4	78.3	75.9	74.7	71.8	76.3	74.0	72.6
December	74.4	81.2	92.0	82.8	82.2	80.1	77.5	79.4	76.0
Total	961.7	918.1	942.6	960.1	965.4	943.6	988.0	978.7	996.8

MG = million gallons

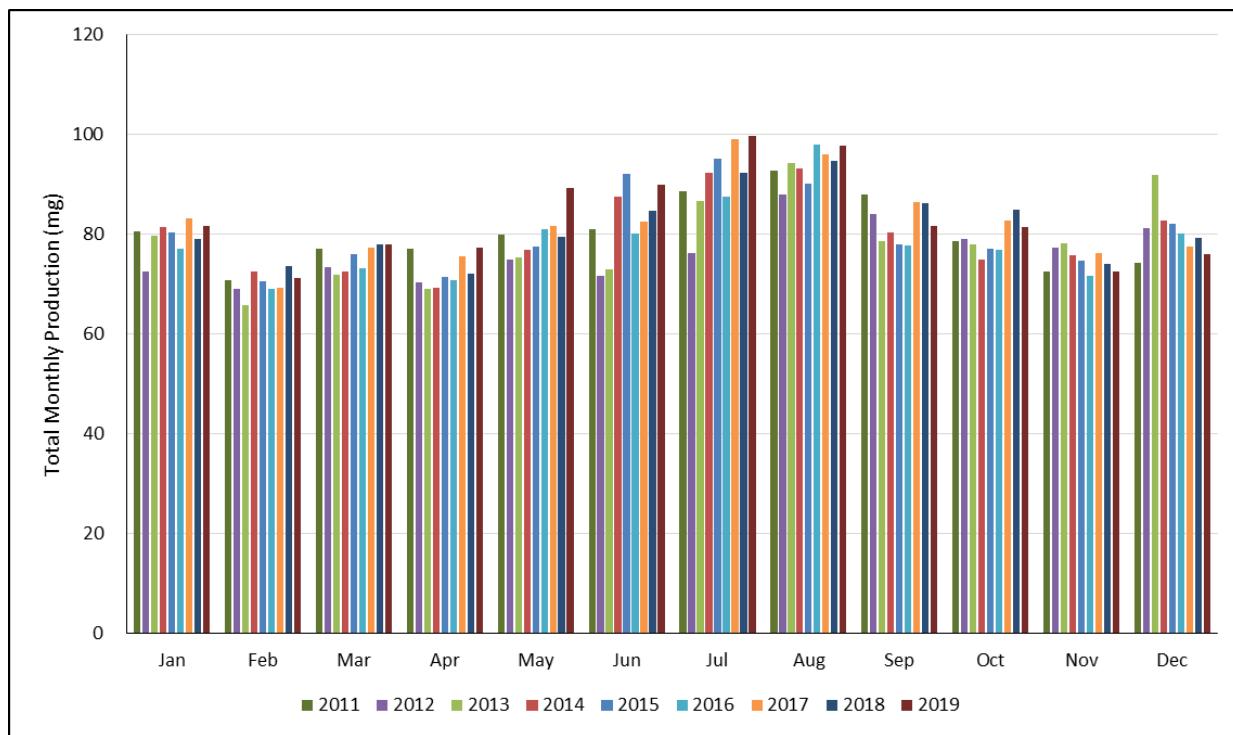


Figure 3-1. Monthly Water Production (2011 – 2019)

3.1.1 Average Day Demand and Maximum Day Demand

A comparison of historical average daily demand (ADD) and maximum day demand (MDD) is provided in Table 3-2. In 2019, ADD was approximately 2.73 million gallons per day (mgd).

The City does not directly measure MDD. Therefore, MDD for each year was calculated based on the methodology described in Section 3.4.1 of the Water System Design Manual (DOH, 2019). In 2019, MDD is estimated to be approximately 4.34 mgd.

The peaking factor represents the proportionate increase in water production required to meet elevated demands typical in the summer months. The 6-Year average peaking factor for 2014-2019 was 1.58; this is consistent with the peaking factor from the prior water system plan (1.6).

Table 3-2. Average Day Demand, Maximum Day Demand, and Peaking Factor (2011 – 2019)

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	6-Year Average
ADD (mgd)	2.63	2.51	2.58	2.63	2.64	2.58	2.71	2.68	2.73	2.66
MDD (mgd)	4.04	3.83	4.10	4.06	4.15	4.27	4.31	4.12	4.34	4.12
Peaking Factor	1.53	1.53	1.59	1.54	1.57	1.66	1.59	1.54	1.59	1.58

mgd = million gallons per day

3.2 Customer Categories, Connections, and Consumption

The City maintains billing record summaries that include the monthly water sold in each customer category. There are eight active customer categories: Single Family, Duplex, Multi-Family, Commercial, Outside City Limits, City Facilities, Irrigation, and Multiplexes Exempt of Excise Tax. The City used to maintain a “Metered Fire Service” category, but this category was discontinued in mid-2018. Customers served along Wishkah Road to the north of the City comprise the Outside City Limits category. The City of Cosmopolis and the Stafford Creek Correctional Center (SCCC) are wholesale customers located outside City Limits but are included in the Commercial category.

The number of connections from 2011 to 2019 is provided in Table 3-3. At the end of 2019, the City had 6,153 connections. The vast majority (77%) were single family.

Table 3-3. Total Connections by Customer Category (2011 – 2019)

	Service Connections								
	2011	2012	2013	2014	2015	2016	2017	2018	2019
Single Family	4,917	4,795	5,197	4,846	4,864	5,244	4,876	4,917	4,749
Duplex	190	189	203	192	191	195	192	191	184
Multi-Family	193	182	195	186	186	193	191	191	189
Commercial ¹	607	588	657	609	612	617	610	611	599
Outside City Limits	324	317	329	320	320	328	330	334	322
City Facilities	47	47	47	47	47	47	45	48	51
Irrigation	36	20	33	33	33	36	36	37	22
Multiplexes Exempt of Excise Tax	39	39	40	38	38	38	38	38	37
Metered Fire Service	2	2	2	2	2	1	1	0	N/A ²
Total	6,355	6,179	6,703	6,273	6,293	6,699	6,319	6,367	6,153

¹ Cosmopolis and Stafford Creek Correctional Center included in Commercial, although both are outside of City Limits.

²Customer category was not active in the system in 2019.

Total annual billed consumption from 2011 to 2019, by each customer class, is shown in Table 3-4.

Table 3-4. Annual Consumption by Customer Category (2011 – 2019)

	Total Consumption (MG)								
	2011	2012	2013	2014	2015	2016	2017	2018	2019
Single Family	265.3	306.8	278.1	261.0	263.6	260.3	264.6	257.1	254.9
Duplex	17.0	18.3	17.6h	15.9	16.1	15.2	16.1	15.8	16.1
Multi-Family	58.3	55.6	56.8	57.8	57.0	53.8	56.7	53.3	51.8
Commercial	246.9	247.2	280.4	277.7	234.9	245.2	254.5	240.4	228.6
Outside City Limits	24.3	23.7	25.4	26.4	28.1	27.1	28.0	26.5	27.7
City Facilities	89.8	74.7	83.6	134.6	87.6	78.4	94.7	105.9	87.9
Irrigation	3.1	2.3	4.0	3.4	3.1	4.2	5.7	3.2	3.0
Multiplexes Exempt of Excise Tax	36.9	39.7	35.9	35.1	34.5	33.8	38.8	35.8	44.2
Metered Fire Service	12.0	9.0	4.1	0.0	0.0	0.0	0.0	0.0	N/A ¹
Total	753.6	777.4	785.8	811.9	724.9	718.1	759.1	738.0	714.2

¹Customer category was not active in the system in 2019.

Figure 3-2 displays the monthly distribution of water use for year 2019, which displays the seasonal nature of water demand (i.e., increased outdoor uses in summer months). The monthly distribution of actual water use may differ somewhat from this representation since billing numbers are based on meter read dates, which lag behind actual use. The average percent of total water consumption for each customer category from 2017 – 2019 is displayed in Figure 3-3.

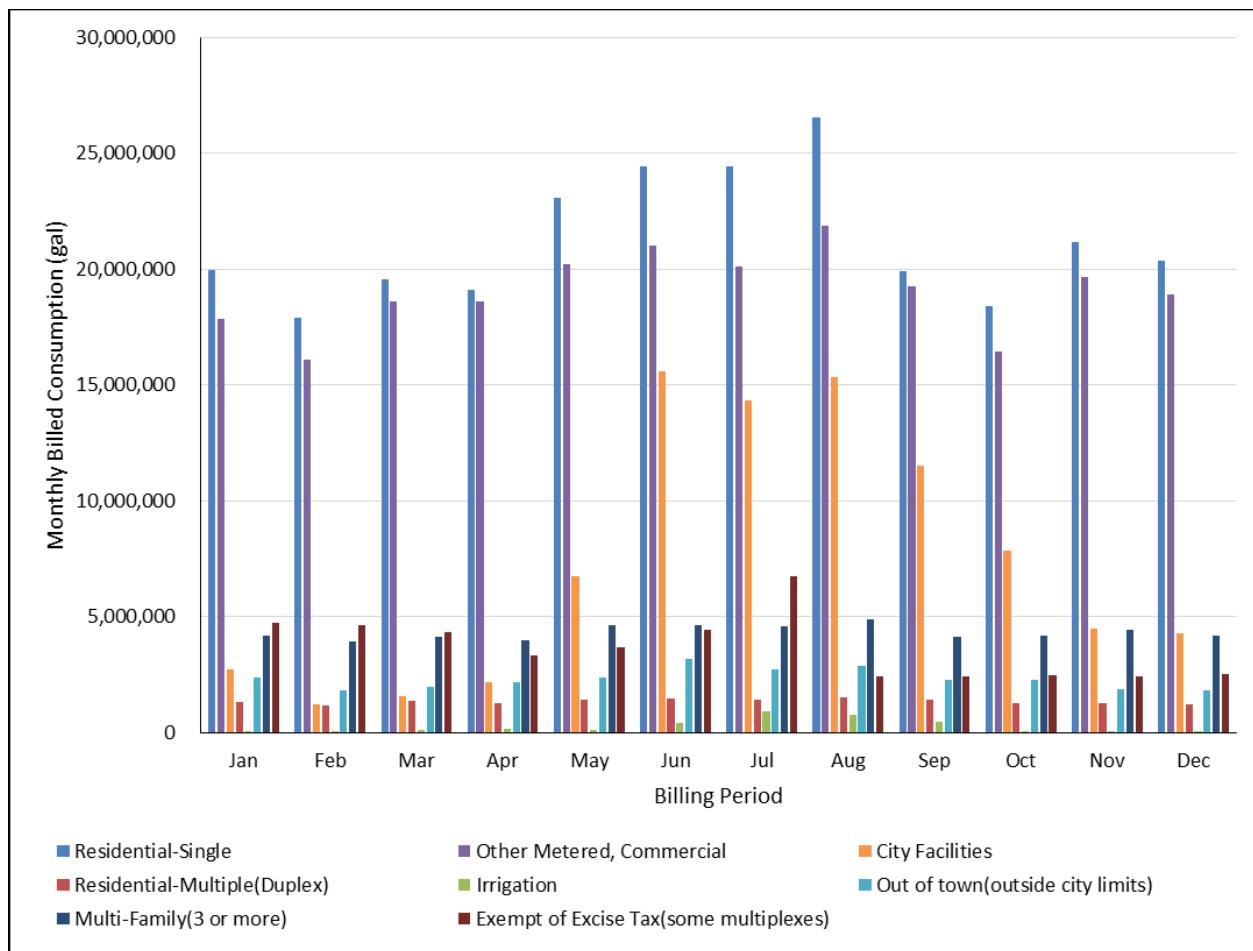


Figure 3-2. Monthly Consumption by Customer Category (2019)

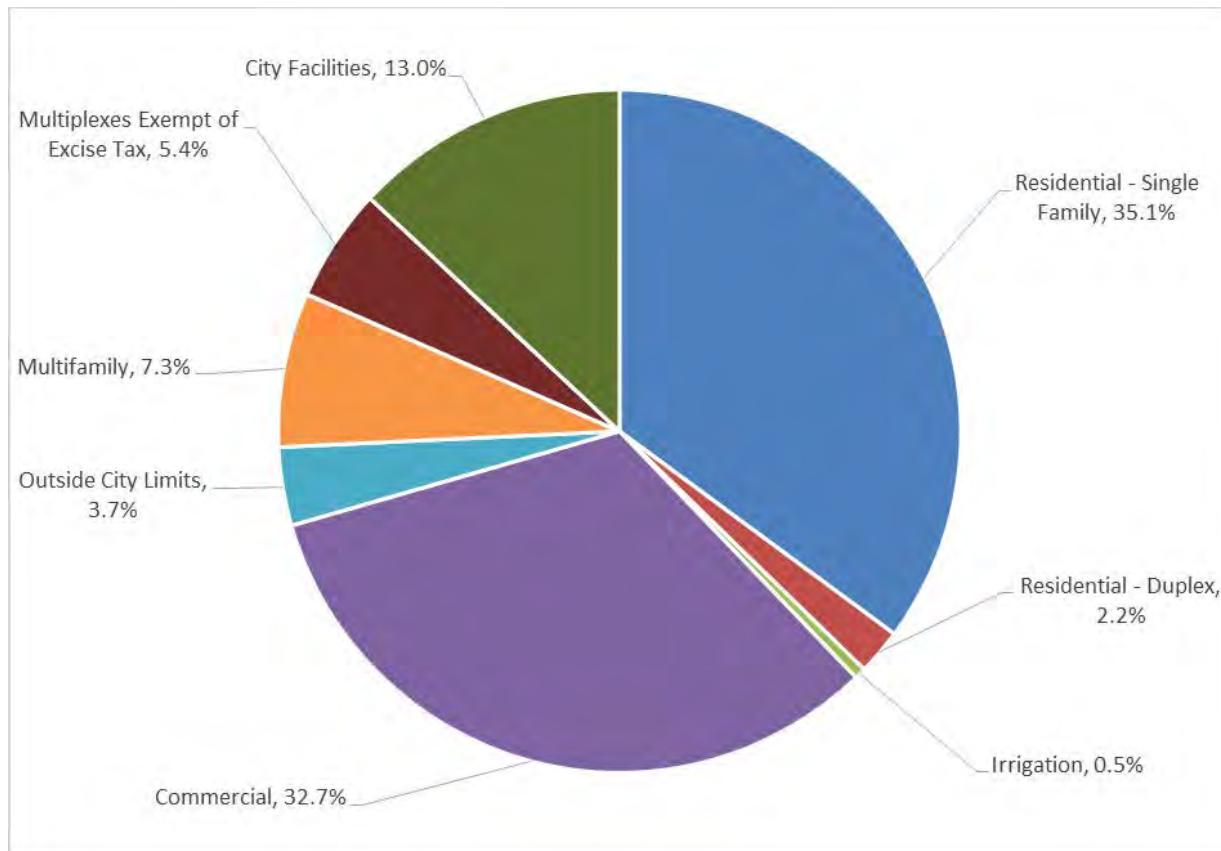


Figure 3-3. Consumption Distribution by Customer Category (2017-2019 Average)

The 20 largest retail users in the City's water system were determined based on billing records. Table 3-5 provides the consumption data for those customers, including their customer class. In 2019, the 20 largest customers consumed approximately 289.6 million gallons, or approximately 41% of total consumption.

Table 3-5. Largest Water Consumers (2019)

Customer	Customer Class	Consumption (MG)
City of Cosmopolis	Commercial	69.5
Aberdeen Sewer Department ¹	City Facilities	65.4
Stafford Creek Correctional Center	Commercial	55.1
Port of Grays Harbor ²	Multiplex	22.8
Cosmo Specialty Fibers	Commercial	9.1
Aberdeen Parks Department - Finch Field	City Facilities	8.8
Sierra Pacific	Out of Town	7.2
Leisure Manor	Multifamily	6.9
Grays Harbor Health and Rehab	Commercial	5.7
Aberdeen Parks Dept - Bishop Complex	City Facilities	5.6
Willis Investment Properties - Weyerhaeuser	Commercial	4.4
Aberdeen Parks Dept - Pioneer Park	City Facilities	4.4
Bayview Redi Mix Inc	Commercial	4.1
Guesthouse International- Best Western	Commercial	3.5
Grays Harbor Community Hospital	Multiplex	3.2
Weyerhaeuser	Commercial	3.1
010280-000	Commercial	2.8
010442-000	Multiplex	2.7
Grays Harbor Historical Seaport	Commercial	2.7
Pacific Veneer	Commercial	2.6
Total		289.6

¹Includes the department and the solids building.

²Includes terminals 1, 2, and 4, which are billed on two separate accounts.

The City of Cosmopolis and SCCC are wholesale customers that are served by Aberdeen. The consumption for these two customers is provided in Table 3-6. The total annual consumption by Cosmopolis and SCCC averaged 132 MG between 2011 and 2019, which is approximately 16% of the total consumption in the City. Both these customers are described in more detail in Section 3.5.

Table 3-6. Wholesale Water Consumers (2011 – 2019)

Customer	Total Consumption (MG)									
	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average
City of Cosmopolis	69	58	60	66	67	77	80	70	70	69
Stafford Creek Correctional Center	63	68	69	69	63	63	63	58	55	64
Total	132	127	129	135	130	140	143	128	125	132

3.3 Water Use Factors and Equivalent Residential Units

ERUs are a method of representing all types of water use as an equivalent number of single-family households. The ERU value represents the average amount of water consumption by a

single family household and is calculated by dividing the single family water consumption by the number of single family connections. Table 3-7 summarizes the single family water consumption, the number of single family connections, and the calculated average day ERU value between 2017 and 2019. The three-year average for 2017-2019 is 146 gpd.

Table 3-7. ERU Value Calculation

	2017	2018	2019	3-Year Average
Single Family Consumption (MG)	265	257	255	259
Single Family Connections	4,876	4,917	4,749	4,847
Average Day ERU Value (gpd)	149	143	147	146

1. Calculated as annual Single Family consumption divided by Single Family Connections and converted to gpd.

3.4 Water Balance and Distribution System Leakage

A water balance is an accounting for all water that is produced. The City's 2019 water balance is shown in Table 3-8. The table is a slightly modified version of the format recommended for use by the American Water Works Association.

The water balance allocates the Water Produced to different categories at four different levels.

Level 1 allocates the water to either Revenue Water or Non-Revenue Water. As implied by the names, Revenue Water generates income while Non-Revenue Water does not. This is helpful in understanding what percent of water production generates income for the City. Additionally, non-revenue water needs to be factored into the demand forecast. The City's 2019 water production is divided into 72% Revenue Water and 28% Non-Revenue Water.

Table 3-8. Water Balance (2019)

	Level 1	Level 2	Level 3	Level 4	Volume (MG)	% of Produced and Purchased Water
Water Produced	Revenue Water	Authorized Consumption	Billed Consumption	1. Billed Water Exported	124.6 ¹	13%
				2. Billed Metered Consumption	589.5 ¹	59%
				3. Billed Unmetered Consumption	0.0 ²	0.0%
	Non-Revenue Water	Distribution System Leakage	Unbilled Consumption	4. Unbilled Metered Consumption	0.0 ²	0.0%
				5. Unbilled Unmetered Consumption	39.0 ³	4%
	Water Produced	Distribution System Leakage	Apparent Losses	6. Unauthorized Consumption	0.0 ⁴	0%
				7. Customer Metering Inaccuracies	0.0 ⁴	0%
			Known Losses	8. Known Leakage	0.0 ⁴	0%
				9. Assumed Leakage	243.6 ⁵	24%
TOTAL				996.8 ⁶	100.0%	

1. Data Source: "2-3 thru 2-7 Water System Data Workbook" spreadsheet provided by City staff.

2. This does not apply to Aberdeen

3. Usage estimated by the City.

4. City staff do not track this number, therefore zero was used in the water balance.

5. Water Production minus all other categories.

6. Data Source: "Aberdeen Production" spreadsheet provided by City staff.

Level 2 splits water production into two sub categories: Authorized Consumption and Distribution System Leakage. Authorized Consumption includes customer usage, hydrant, and other uses tracked by the City. Distribution System Leakage (DSL) is water lost or unaccounted for in the distribution system.

Level 3 splits Non-Revenue Water into the following three sub-categories, which are useful in identifying potential additional revenue sources and identifying the magnitude of leaks or other losses that could be addressed:

- **Unbilled Authorized Consumption:** Includes uses such as water system flushing (estimated using typical flush volumes multiplied by the number of hydrant flushes per day), firefighting (estimated using SCADA trends), and unbilled contractor use (metered). Typically, it is standard practice not to charge for uses falling into this sub-category. However, it is always a prudent idea to review these uses to ensure that a legitimate revenue opportunity is not missed.
- **Apparent Losses:** Includes unauthorized uses and customer meter inaccuracies, both of which are lost revenue opportunities.
- **Real Losses:** Includes various types of system leaks. A certain level of leakage is unavoidable; however, leakage beyond that level should be repaired to avoid unduly burdening both the natural resource and the physical infrastructure. Any amount that cannot be assigned to another category is considered a real loss under the American

Water Works Association's protocol, as well as per the formula for calculating distribution system leakage under Washington State's Water Use Efficiency Rule.

Level 4 further splits water into additional sub-categories to support further estimation and water management.

A longer history of certain water balance elements, namely distribution system leakage and non-revenue water is provided in Table 3-9.

Table 3-9. Distribution System Leakage and Non-Revenue Water

Year	Water Produced (MG)	Authorized Consumption		Distribution System Leakage		Non-Revenue Water		
		Billed Consumption	Unbilled Consumption	Qty	Percent of Production	Qty	Percent of Production	Percent of Consumption
2011	962	754	29	179	19%	208	22%	28%
2012	918	777	27	114	12%	141	15%	18%
2013	943	786	28	129	14%	157	17%	20%
2014	960	812	29	119	12%	148	15%	18%
2015	965	725	31	209	22%	240	25%	33%
2016	944	718	33	193	20%	226	24%	31%
2017	988	759	34	195	20%	229	23%	30%
2018	979	738	36	205	21%	241	25%	33%
2019	997	714	39	244	24%	283	28%	40%
2017-2019 Average	988	737	36	215	22%	251	25%	34%

Between 2017 and 2019, the DSL averaged 22% of production. As the DSL is greater than 10% of production, DOH requires that the City develop a Water Loss Control Plan. This is prepared as part of the water system plan update and included in the conservation chapter.

3.5 Wholesale Customers

The City of Cosmopolis and the Stafford Creek Correctional Center are two wholesale customers served by the City of Aberdeen.

3.5.1 City of Cosmopolis

In August 2011, the City of Aberdeen and Cosmopolis signed a municipal water supply contract by which Aberdeen is required to provide a maximum water supply of 12,350 CCF (approximately 9.238 MG per month). A copy of this contract is included in Appendix B.

3.5.2 Stafford Creek Correctional Center

The SCCC, owned and operated by the State Department of Corrections (DOC), is another wholesale customer of the City. It has its own demand projections, which are used in developing its contribution to the City's demand forecast. SCCC began receiving water service in the year 2000, and between 2011 and 2019, SCCC used an average of 64 MG per year. The maximum amount SCCC used during this period was 69 MG in 2014.

SCCC staff reported that the prison reached its full capacity in March 2004. Since then, the population has varied, but remains close to its full capacity. Aberdeen expects SCCC will require no additional water needs over the forthcoming 20 year planning period.

3.6 Water Demand Forecast

The methodology of the water demand forecast is to forecast demands by customer class forward from a base year (2019) using annual growth rates. Demands are also developed for non-revenue water. The billed consumption and the non-revenue demands are summed to create the total average day demand. To generate the total maximum day demand, a peaking factor is applied to the average day demand. More details on each step are provided below.

- **Step 1 – Billed Consumption.** Consumption is divided into nine components: Single family, duplex, multi-family, commercial (including wholesale demands for SCCC), outside city limits, city facilities, other (irrigation and metered fire service), large users, and City of Cosmopolis wholesale demands. With the exception of the large users, Cosmopolis, and SCCC, demand projections increase according to the annual growth rates based on the 2017 State Office of Financial Management (OFM) Medium Population Projections for Grays Harbor County, which are 0.10% between 2019 and 2020, and 0.22% from 2020 through 2040.
- Single family projections begin with single family consumption observed in 2019, and then increase using the annual growth rates described previously. This same methodology is used for all other customer categories except for the largest users and wholesale customers.
- The 20 largest users are evaluated separately from these categories, with their demands based on total 2019 consumption and held constant through the planning period, as there are no significant changes anticipated with respect to water usage by these customers. This includes SCCC. In the future, large scale industrial or commercial development is assumed to be served by the Industrial Water System which can provide up to 16 MGD from the Wynoochee River.
- The City of Cosmopolis demand projection is based on the current contracted amount that the City of Aberdeen is required to provide (approximately 0.30 mgd, or 111 million gallons per year). This is a conservative assumption, as Cosmopolis doesn't typically exercise the full contract amount.
- **Step 2 – Non-Revenue Water.** Projected authorized non-revenue water is the average authorized non-revenue water from 2017-2019, and is held constant throughout the planning period.
- To calculate distribution system leakage, the City converted the average DSL as a percent of production (DSL_p) from 2011 through 2019, to a percent of consumption (DSL_c) using the following formula:

$$DSL_c = \frac{DSL_p}{1 - DSL_p}$$

The DSL_c was applied to the subtotal of forecasted consumption and authorized non-revenue to determine the total DSL.

- **Step 3 – Average Day Demand.** The total average day demand is the sum of the total billed consumption and non-revenue (authorized and DSL) demand projections.
- **Step 4 – Maximum Day Demand.** The projected maximum day demand is the average day demand multiplied by the MDD:ADD peaking factor of 1.6. This is the average peaking factor from 2014-2019, with a factor of safety added by rounding to the nearest 0.1.

Table 3-10 displays the City's demand forecast for the base year, 10-year, and 20-year planning periods. The number of ERUs for each customer class were calculated by dividing the ADD demand projection by the value of an ERU (146 gpd per household). Figure 3-4 graphically depicts the demand forecast pattern throughout the planning period.

Table 3-10. Demand Forecast

Water Use Category	Base (2020)			10-Year (2030)			20-Year (2040)		
	No. of ERUs	Demand (MGD)		No. of ERUs	Demand (MGD)		No. of ERUs	Demand (MGD)	
		ADD	MDD		ADD	MDD		ADD	MDD
Residential - Single Family	4,777	0.70	1.12	4,883	0.71	1.14	4,990	0.73	1.17
Residential - Duplex	301	0.04	0.07	308	0.05	0.07	315	0.05	0.07
Irrigation	56	0.01	0.01	57	0.01	0.01	58	0.01	0.01
Commercial	2,979	0.44	0.70	3,007	0.44	0.70	3,034	0.44	0.71
Outside City Limits	519	0.08	0.12	527	0.08	0.12	536	0.08	0.13
Multifamily	971	0.14	0.23	993	0.15	0.23	1,014	0.15	0.24
Multiplexes Exempt of Excise Tax	829	0.12	0.19	835	0.12	0.20	842	0.12	0.20
City Facilities	1,647	0.24	0.39	1,648	0.24	0.39	1,650	0.24	0.39
Cosmopolis Wholesale	2,076	0.30	0.49	2,070	0.30	0.48	2,076	0.30	0.49
Subtotal	12,080	1.77	2.83	12,259	1.79	2.87	12,439	2	2.91
Authorized Non-Revenue	680	0.10	0.10	680	0.10	0.10	680	0.10	0.10
DSL	3,693	0.54	0.54	3,737	0.55	0.55	3,783	0.55	0.55
Total Demand	16,453	2.98	3.47	16,676	3.02	3.52	16,902	3.05	3.56

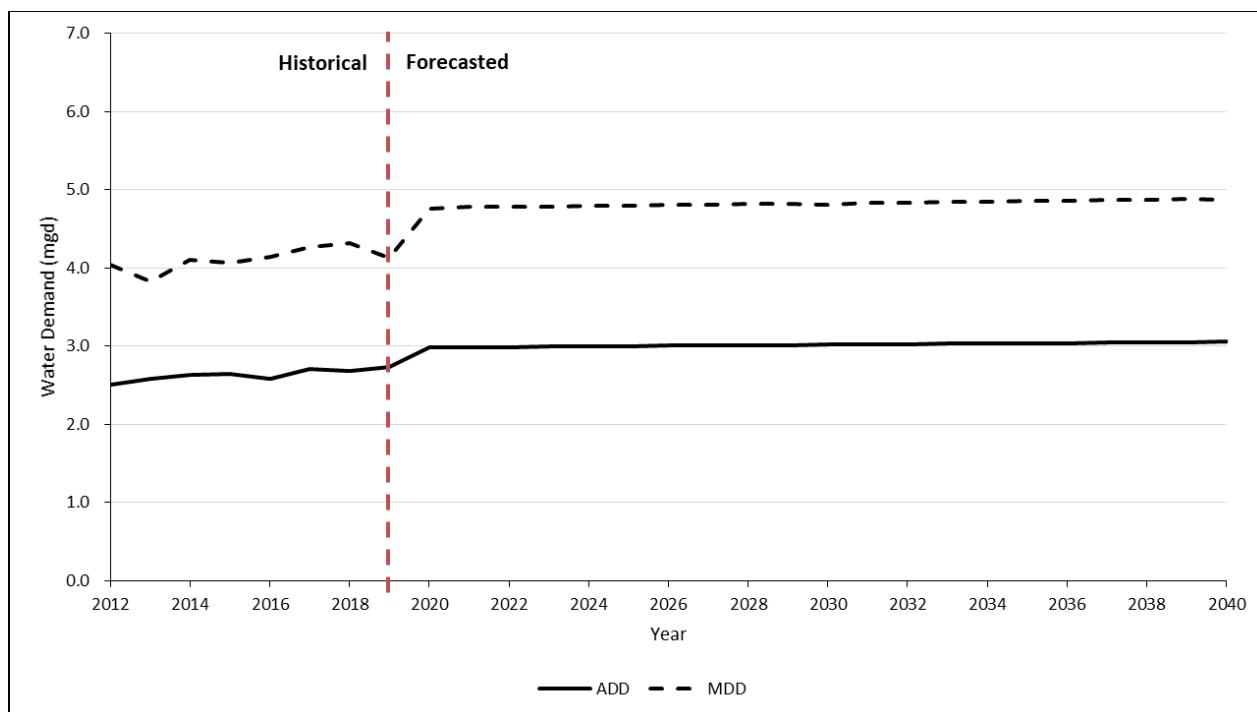


Figure 3-4. Demand Forecast

3.6.1 Conservation Adjustment

Chapter 4 of this plan describes the City's Water Use Efficiency Plan. As part of the plan, the City must account for how their water conservation efforts will affect the demand forecast. The City considered a scenario where they are able to meet their DSL reduction target of 10% of production by 2030. Table 3-11 shows how this reduction of DSL would impact the demand forecast.

Table 3-11. Water Demand Forecast Summary With and Without Additional Conservation

Water Use Category	Base (2020)			10-Year (2030)			20-Year (2040)		
	No. of ERUs	Demand (MGD)		No. of ERUs	Demand (MGD)		No. of ERUs	Demand (MGD)	
		ADD	MDD		ADD	MDD		ADD	MDD
Total Demand	16,453	2.98	3.47	16,676	3.02	3.52	16,902	3.05	3.56
Additional Conservation	0	0.00	0.00	(2,069)	(0.30)	(0.30)	(2,089)	(0.31)	(0.31)
Total Demand with Conservation	16,453	2.98	3.47	14,607	2.71	3.21	14,814	2.75	3.26

4. Water Use Efficiency

This chapter summarizes the City's compliance with State water use efficiency (WUE) planning requirements, actions the City has taken to promote water use efficiency, and the City's WUE program planned for implementation from 2021-2027.

4.1 Water Use Efficiency Requirements and Compliance Summary

The WUE planning requirements that must be addressed in water system plans are contained in the following Washington State Department of Health (DOH) documents and State law:

- State of Washington Water Use Efficiency Rule (January 2007)
- Department of Health Water Use Efficiency Guidebook (January 2017)
- Department of Health Water System Planning Handbook (August 2020)

The Water Use Efficiency Rule has several requirements and corresponding compliance dates. To summarize, municipal water suppliers must:

- Publicly establish water savings goals.
- Evaluate or implement water-saving measures to achieve the goals.
- Develop and implement a WUE program to support the established goals.
- Report annually on the progress towards achieving the goals.
- Achieve a standard of not more than 10% water loss.

The requirements are intended to support the goal of ensuring safe and reliable drinking water by contributing to long-term water system reliability and public health protection, promoting good stewardship of water resources and ensuring the efficient operation and management of water systems.

There are seven main categories of WUE requirements:

1. Water meters
2. Data Collections
3. Demand Forecasting
4. WUE Program
5. Distribution System Leakage
6. Goal Setting and Public Forum
7. Annual WUE Reporting

Aberdeen has been in, and remains in, compliance with the WUE requirements. The remainder of this chapter addresses category 4, the WUE program, which has eleven requirements:

1. Describe the WUE program
2. Estimate water savings
3. Identify goals
4. Evaluate conservation measures
5. Describe the next 6-year conservation program
6. Educate customers
7. Project water savings from measures
8. Evaluate program effectiveness
9. Estimate system leakage (described in Chapter 3)
10. Evaluate reclaimed water opportunities (described in Chapter 5)
11. Evaluate rate structure (described in Chapter 10)

4.2 Conservation Goals

The Aberdeen City Council adopted a water-use efficiency goal on December 15, 2016, which directed the most recent 6-year WUE program (2017 – 2023). The City's goal was to:

- 1) *Assist 20 customers per year find and identify leaks caused by faulty toilets. This goal will provide a benefit to the public by potentially reducing their monthly charges on their utility bill; which helps for conservation practices.*

Additionally the City continues to work towards their supply-side goal of reducing distribution system leakage to a maximum of 10% each year.

The City re-adopted these goals at the regular City Council meeting on March 10, 2021, so they represent the City's formal water use efficiency goals effective 2021-2027.

4.3 Existing Conservation Program

The City monitors customer utility accounts for high consumption. If a customer's consumption is in excess of their consumption in prior months or appears abnormal, the City reviews the customer's hourly consumption to determine if there is a pattern of use during hours when water is not typically used.

If a customer's usage is deemed to be higher than normal or if an abnormal pattern of usage is identified, then the City sends a customer service representative to inspect the water meter. A notice is posted on the customer's door after the water meter has been checked that informs the customer of high consumption and the possibility of a leak or faulty toilet(s). Along with the notice the City leaves toilet dye strips for the customer to use to help identify if they have toilet leaks. Customers are also informed that they can apply for a leak adjustment once they have repaired or replaced the faulty mechanism(s).

In addition to the procedure described above, the City has employed the following tactics in its WUE program:

- **Program Promotion:** The City promotes conservation through informational pamphlets inserted with customer bills, providing consumption information to customers compared with average residential consumption and historic consumption data. The annual Consumer Confidence Report includes descriptions of water conservation practices for outdoor water use.
- **Conservation Rate Pricing:** The City established a conservation rate in January 2007; which customers could reduce their water bill by conserving water. The current rates established in 2020 for single-family and duplex residential connections are a fixed charge of \$26.78 per month, plus \$1.89 per hundred-cubic-feet of water purchased up to 1,299 cubic feet. Additional charges are applied for monthly usage beyond 1,299 cubic feet. A reduced monthly rate is charged for water usage below 4 CCF.
- **Customer Outreach:** The City provides rain gages, low flow valves, and educational outdoor conservation water use materials to encourage water conservation and reduce residential irrigation.

4.4 Conservation Effectiveness Evaluation

After adoption of the conservation goal in 2016, the City almost immediately received 11 submissions for leak adjustments due to faulty toilets.

In 2017 the City checked over 500 water meters and notified the customers that they had abnormal water usage which may have been attributed to a leak or faulty toilets. Twenty-four customers filed for leak adjustment requests following the meter inspection.

The water savings realized from customer leak adjustments does not account for potential additional saving from customers who fixed leaks without reporting the leak was fixed (and therefore, no lead adjustment provided).

4.5 Future Conservation Program

The City will continue implementing its current conservation program and will strive to achieve its current water use efficiency goals, as described in the previous sections.

4.6 Water Loss Control Action Plan

Along with the demand-side conservation goal related to customer assistance, the City re-adopted its supply side goal, which is to reduce the City's distribution system leakage to less than 10%, per guidance in the WUE Rule. The City chose to retain the goal because DSL measurements have been inaccurate due to end-user water meter issues. The City had installed Sensus iPerl meters throughout the system, which turned out to be problematic regarding metering accuracy in subsequent years. It is unknown what effect the meters had on the City not meeting the DSL requirements. The City fully replaced the end-user meters in the mid-2010s and subsequently re-adopted the proposed supply-side goal.

The City is currently aware of two significant issues causing high volumes of water loss:

1. Reservoir covers are failing, which causes evaporative losses between 100,000 and 200,000 gallons per day.
2. The City estimates transmission losses from the water treatment plant to the reservoir between 100,000 and 300,000 gallons per day. This value changes with the season.

The City intends to address the failing reservoir covers in 2021. The City continues to replace old failing water lines on a regular basis. The City has also identified several options for controlling DSL it may pursue in the future including:

- Identify and implement best management practices for identifying distribution system leaks, including continual optimization and annual calibration of the City's Fairview Reservoir mag meters, replacing the larger older meters (failing to meet AWWA meter accuracy standards), replacing older water mains when it's no longer feasible to repair, and also repairing or replace leaking valves.
- Hire an outside leak detection company to survey the City's distribution system, to help identify and locate hard to detect leaks.
- Purchase leak detection equipment and devices to monitor and locate hard to find leaks.

The City currently utilizes a fixed network advanced metering infrastructure (AMI) system for the collection of the City's hourly meter reading transmissions in which some the leak detection equipment is compatible and could work in conjunction with the City's existing infrastructure. The City will continue to explore a suitable approach to replacing portions of the transmission line.

5. Water Rights and Source Reliability

Since 1914, the City has relied on the Wishkah River as its potable water supply. This chapter describes the watershed, diversion facility, water availability, water rights in general, and water rights associated with this source.

5.1 Watershed Control Program

Watershed Description and Characteristics

The Wishkah River, at the point of diversion, drains a 7,400 acre basin in the foothills of the Olympic Mountains. The watershed ranges from 432 feet in elevation at the point of diversion to as high as 1,500 feet along the divide. It is predominantly second growth forest.

The City owns approximately 1,200 acres within the 7,400 acre watershed. A significant portion of the watershed not owned by the City is under the jurisdiction of the U.S. Forest Service, and the remainder is primarily owned by Rayonier Forest Resources and Green Diamond Resource Company. The City's portion of the watershed is in the vicinity of the diversion structure and access is not granted to the public. Entry onto City and private property in the watershed is controlled in accordance with Grays Harbor County (County) Ordinance No. 50, which prohibits entry except for authorized purposes. The Forest Service property is closed to motorized vehicles but foot traffic, including hunting, is permitted. The perimeter of the watershed, except the Forest Service area, is posted with signs and yellow markings. During hunting season the watershed is patrolled frequently by Water Department personnel. During the remainder of the year it is randomly patrolled.

Much of the original timber in the watershed was harvested in the early 1900s and harvesting of mature second growth by the private landowners is ongoing. Most of the Forest Service property was logged in recent years. The City had not conducted any significant timber sales on any of its 1,200 acres within the watershed boundary prior to 2019. The City prepared a Forest Management Plan in 2018 and performed a harvest of second growth timber in 2019. The City plans to continue managing and harvesting timber in the watershed.

The City updated its Watershed Control Plan in 2011 and is approved by DOH. A copy is located in Appendix E.

Inventory of Potential Contaminant Sources

In November 2020, an inventory of potential contaminant sources was developed using Ecology's Facility/Site Identification Database (FSID). This database lists any operation that is a potential or active source of pollution. This includes gas stations, automotive stores, dry cleaners, gravel pits, waste management sites, and industrial facilities. Table 5-1 summarizes the review of the database, identifying all sites that were located within the 7,400 acre watershed area. The only sites identified in the database include the City's dam structures and headworks facilities (which are not really potential contaminant sources, but are listed here nonetheless since they are noted in the FSID).

Table 5-1. Potential Contaminant Sources

FID	DOE Facility ID	Site Name	Type of Point Source	Ecology Program
0	26946483	Wishkah Reservoir No 3 Dam	Dam Site	WATRES
1	45541625	Aberdeen City Wishkah Headworks	Emergency/Haz Chem Rpt TIER2	HAZWASTE
2	75598245	Wishkah Reservoir No 2 Dam	Dam Site	WATRES
3	92457742	Malinoski Dam	Dam Site	WATRES

5.2 Diversion Facility

Water is drawn from an impoundment behind Malinowski Dam, a concrete gravity structure constructed in the early 1960s. The reservoir has an estimated storage capacity of 120 acre feet (AF). Although it can be drained through the Dam, the reservoir is generally operated with water flowing over the spillway crest to skim debris from the surface. The Dam appears to be well maintained and in excellent condition. Day-to-day maintenance and monitoring is carried out by the City's Water Department staff based out of Aberdeen

During late summer low flows on the Wishkah River, the volume of water behind the dam that is available for operation of the water system can become low. In 2020 the City started a planning exercise to explore options to mitigate for or remove sediment to restore water volume in the reservoir.

5.3 Water Rights

The availability of water from the Wishkah River for use by the City is dependent upon legal rights to withdraw and beneficially use the water, the hydrologic yield of the river, and the capacity of the transmission main. Previous studies have shown that the hydraulic yield is sufficient to meet the projected demands. Hydraulic analysis of the transmission main presented in Section 1.5.1 shows that it has sufficient capacity to meet projected demands. The following sections are a discussion of existing water rights and an evaluation to meet projected demands.

5.3.1 Existing Water Rights

The City's water rights, as summarized on Table 5-2, include two claims to vested right, three reservoir certificates, and five surface water certificates. This table includes all sources, including the industrial water supply from the Wynoochee River.

The two claims are for 8.9 cubic feet per second (cfs) and 55 cfs from Stewart Creek and the Wishkah River, respectively. As indicated in Section 5.4, these are not confirmed water rights.

One of the reservoir certificates (48 AF) relates to the Wishkah River; a second (600 AF) for Lake Aberdeen; and the third (70,000 AF) for storage behind the Wynoochee Dam on the Wynoochee River.

Appropriations from the Wynoochee River are under two certificates for 110 cfs and 25 cfs and one for 1,400 cfs (this is for power purposes). The City also has a certificate for 0.03 cfs from "C" Creek and 5.0 cfs from Elliott Slough Creek.

Table 5-2. Summary of Water Rights

Source	P.O.D. Location ⁽¹⁾	Water Right Identifier ⁽²⁾	Date of Priority	cfs	Quantities		Comments
					MGD	AF/yr	
Stewart Creek	T.17N.R09W-04C	Claim #002922	12/1891	8.9	5.75	6,450	(3)
Wishkah River	T.21N.R08W-33F&M	Claim #002299	12/12/16	55	35.54	40,000	(4)
Wishkah River	T.21N.R08W-28N	C-327	04/12/28			48	(5)
"C" Creek	T.21N.R08W-33E	SWC-434	11/16/29	0.03	0.02		(6)
Elliott Slough	T.17N.R09W-01	SWC-5345A	01/15/27			600	(7)
Van Winkle Creek	T.18N.R09W-36	SWC-5345B	01/15/27	5	3.23		
Wynoochee River	T.22N.R07W-20E	R2-00905C	01/18/29			70,000	(8)
Wynoochee River	T.18N.R08W-28	SWC-7097	01/15/27	110	71.09		(9)
Wynoochee River	T.18N.R08W-28F	S2-00140A	03/24/55	25	16.16	18,372	(10)
Wynoochee River	T.22N.R07W-20C	S2-25765C	11/26/80	1,400			(11)
			Total	195.03	126.04	129,020	(12)

(1) The location of point of diversion (POD) is given by township, range, section, and where possible from the water right printout, the 40-acre tract within the section. For example, in the POD location T.17N.R09W-04C, the part preceding the hyphen indicates the township and range north and west of the Willamette base line and meridian, respectively. The number following the hyphen indicates the section (4) and the letter (C) gives the 40-acre tract within the section which corresponds to the NE 1/4 of the NW 1/4 of Section 4, as shown in the schematic below:

D	C	B	A
E	F	G	H
M	L	K	J
N	P	Q	R

(2) The water right identifier numbers represent claim numbers, certificate numbers, and/or permit numbers. The number R2-00905C is a reservoir certificate.

(3) This is a claim of water right filed in 1971 pursuant to Chapter 90.14 RCW. The purpose of use is described as municipal supply (emergency use) with the place of use being: within the boundaries of the city limits of the City of Aberdeen T.17N.R9W.W.M.

(4) This claim identifies two points of diversion, one authorized by Certificate of Change No. 259, which moved 10.5 cfs of the originally appropriated 55 cfs to the SE 1/4 of the NW 1/4 of Sec. 33, T.21N.R8W.W.M. The purpose of use is municipal supply and the place of use is described as: within the boundaries of the city limits of the City of Aberdeen T.17N.R9W.W.M.

(5) This certificate authorizes the storage of 48 acre-feet for domestic and industrial use within the City of Aberdeen.

(6) This certificate does not identify an annual authorization. The purpose of use is domestic and operation of a chlorine feeder and the place of use is the SE 1/4 of the NW 1/4 of the SW 1/4 of Sec. 33, T.21N.R8W.W.M.

(7) This certificate authorizes an appropriation of 5 cfs for manufacturing and domestic supply purposes and the storage of 600 acre feet in Lake Aberdeen. The purpose of use for the stored waters is identified as domestic supply and industrial water supply. The place of use is "City of Aberdeen, Grays Harbor County, Washington."

(8) This reservoir certificate authorizes the storage and use of waters for municipal and industrial supply with the place of use described as: area served by City of Aberdeen."

(9) This certificate does not have an annual quantity identified. The purpose of use is identified as industrial and domestic use and the place of use is: "City of Aberdeen."

(10) This certificate is for municipal and industrial supply with the place of use shown as: Area served by City of Aberdeen. Use of this authorized 25 cfs during low flow periods is constrained by a complex set of minimum flow conditions on the water right. A Superseding Certificate was issued by Ecology in 2000 to

reduce the original right from 45 to 25 cfs. The remaining 20 cfs was transferred to the Grays Harbor Public Development Authority to be diverted from Ranney Collectors adjacent to the Chehalis River.

- (11) The purpose of use is "hydroelectric power" and permit is conditioned with minimum flow requirements pursuant to Chapter 173-522 WAC.
- (12) Quantity on the Stewart Creek Claim No. 002922 has not been included in totals because it is identified for emergency use; quantity under S2-25765C not included because it is only for power generation purposes.

5.3.2 Water Rights Evaluation

Chapter 3, and specifically Table 3-10, contains information on existing and projected residential and commercial water use by the City for the areas currently served by the City's domestic water supply system. The source for this water use is the Wishkah River. No analysis of this nature is being performed under this update to the WSP for the industrial water use, which has the Wynoochee River as the source. This section will therefore only address the water rights evaluation for the Wishkah River source.

As discussed in Section 5.3 - Water Availability, and shown in Table 5-2, the City has a water right claim to support the diversion from the Wishkah River for domestic/municipal supply. This claim is for 55 cfs (35.54 mgd) and 40,000 acre-feet per year (AF/yr) and is shown to have a priority date of December 12, 1916. The basis for this claim is that the initial diversion of water from this source predated the 1917 Surface Water Code. The City has complied with the requirements of the Water Code by filing a water right claim for this use of water.

Table 5-3 shows the City's existing and forecasted water rights status, respectively. The City's average day and peak day existing and projected water use were converted to AF/yr and gpm, respectively, to equate the terms to those normally used to describe water rights, then compared to the quantities shown for the City's water right claim for water use from the Wishkah River. This comparison shows a surplus in water rights for the 20-year projection for both the average day and peak day basis. The surplus in water rights shown in Table 5-3 amount to over 36,500 AF/yr and over 22,200 gpm for the 20-year projection period.

Table 5-3. Water Rights Self-Assessment

Water Right Permit, Certificate, or Claim #	WFI Source #	Existing Water Rights				Current Source Production – Most Recent Calendar Year (2020)				10-Year Forecasted Source Production (determined from WSP, 2030)				20-Year Forecasted Source Production (determined from WSP, 2040)				
		Qi= Instantaneous Flow Rate Allowed (GPM or CFS) Qa= Annual Volume Allowed (Acre-Feet/Year) This includes wholesale water sold				Qi = Max Instantaneous Flow Rate Withdrawn (GPM or CFS) Qa = Annual Volume Withdrawn (Acre-Feet/Year) This includes wholesale water sold				This includes wholesale water sold				This includes wholesale water sold				
		Primary Qi Maximum Rate Allowed (gpm)	Non-Additive Qi Maximum Rate Allowed	Primary Qa Maximum Volume Allowed (AFY)	Non-Additive Qa Maximum Volume Allowed	Total Qi Maximum Instantaneous Flow Rate Withdrawn (gpm)	Current Excess or (Deficiency) Qi (gpm)	Total Qa Maximum Annual Volume Withdrawn	Current Excess or (Deficiency) Qa	Total Qi Maximum Instantaneous Flow Rate in 10 Years (gpm)	10-Year Forecasted Excess or (Deficiency) Qi (gpm)	Total Qa Maximum Annual Volume in 10 Years	10-Year Forecasted Excess or (Deficiency) Qa	Total Qi Maximum Instantaneous Flow Rate in 20 Years (gpm)	20-Year Forecasted Excess or (Deficiency) Qi (gpm)	Total Qa Maximum Annual Volume in 20 Years	20-Year Forecasted Excess or (Deficiency) Qa	
002299 – Wishkah River	S01	24,686	--	40,000	--	2,408	22,278	3,340	36,600	2,441	22,245	3,379	36,621	2,476	22,210	3,421	36,579	
		TOTALS =	24,686	--	40,000	--	2,408	22,278	3,340	36,600	2,441	22,245	3,379	36,621	2,476	22,210	3,421	36,579

INTERTIES: Systems receiving wholesale water complete this section. Wholesaling systems must include water sold through intertie in the current and forecasted source production columns above.

Name of Wholesaling System Providing Water	Quantities Allowed In Contract		Expiration Date of Contract	Currently Purchased				10-Year Forecasted Purchase				20-Year Forecasted Purchase					
	Maximum Qi Instantaneous Flow Rate (gpm)	Maximum Qa Annual Volume		Current quantity purchased through intertie				Forecasted quantity purchased through intertie				Forecasted quantity purchased through intertie					
	Maximum Qi Instantaneous Flow Rate	Current Excess or (Deficiency) Qi	Maximum Qa Annual Volume	Current Excess or (Deficiency) Qa	Maximum Qi 10-Year Forecast	Future Excess or (Deficiency) Qi	Maximum Qa 10-Year Forecast	Future Excess or (Deficiency) Qa	Maximum Qi 20-Year Forecast	Future Excess or (Deficiency) Qi	Maximum Qa 20-Year Forecast	Future Excess or (Deficiency) Qa					
Hoquiam Emergency Intertie	1,042	N/A		Only used for emergencies													
	TOTALS =																

Notes:

The City has no pending water right applications.
The City has no interruptible water rights.

5.4 Reclaimed Water

As noted in the previous water rights sections, the City of Aberdeen has an abundant source for water. The existence of the City's industrial water system, combined with capacity of the City's domestic water system, has limited the City's need to investigate reclaimed water opportunities. The City's reclaimed water checklist is in Appendix F.

With additional improvements, the City's wastewater treatment plant could potentially produce reclaimed water. However, the infrastructure required to convey reclaimed water from the treatment plant to potential customers is unnecessary given the current benefits available from the existing industrial water system.

The Sewer Department had been using domestic water for its chlorine gas-based disinfection system at the Aberdeen Wastewater Treatment Plant (WWTP) up until 2020. A new bulk sodium hypochlorite system was installed and significantly reduced the demand for potable water at the WWTP.

For the long term, if needed, the City will consider opportunities for use of industrial water to help offset demands on the domestic water system. Potential transfers of domestic water users to industrial water may include City parks, playgrounds, and schools in the vicinity of the existing industrial water line. The cost of infrastructure to serve these customer types from the industrial water line, including pipelines and pump stations, will be evaluated and compared with the cost of additional domestic water system capacity, if needed.

6. Water Quality

This chapter provides a review of current state and federal drinking water quality regulations to assess Aberdeen's compliance with these regulations between 2011 and 2019. In addition, this chapter describes the City's efforts in responding to customer complaints and the conducting of additional monitoring for the purpose of customer acceptability. Finally, this chapter reviews proposed and possible future regulations and the City's needs in planning for future compliance.

6.1 System Overview and Water Quality Compliance Responsibility

The City has one active source of supply: The Wishkah River. The City treats the surface water from this source at the Water Treatment Plant (WTP) through treatment processes consisting of coagulation, pre-filtration, micro filtration, and addition of chlorine (to provide disinfection and a disinfectant residual in the transmission and distribution systems) and fluoride. The WTP also provides alkalinity and pH adjustment for corrosion control.

As a Group A public water system, the City is required to follow Chapter 246-290 WAC which implements the Safe Drinking Water Act (SDWA). The City is required to comply with the monitoring requirements according to this chapter unless DOH allows the City to reduce these requirements.

6.2 Drinking Water Regulatory Framework

Washington State drinking water suppliers are subject to both federal and state drinking water regulations. At the federal level, the SDWA (1974) and SDWA Amendments (1986 and 1996) give the United States Environmental Protection Agency (USEPA) the responsibility of developing and administering national standards for drinking water quality. Table 6-1 presents a list of federal drinking water regulations that have been developed as part of the SDWA and amendments that were in effect between 2011 and 2019, which is the period under review for this Water System Plan (WSP) update. Proposed regulations that are anticipated to become effective in the future are discussed later in this chapter.

The Department of Health (DOH) is the primacy agency responsible for ensuring that drinking water laws are implemented and enforced. Washington State must adopt laws at least as stringent as federal regulations. When a federal drinking water law has yet to be included in state drinking water codes, drinking water suppliers are responsible for meeting federal regulatory requirements as put forth by the USEPA.

Table 6-1. Federal Drinking Water Regulations Applicable to Aberdeen

Rule and Date Rule Became Effective	Parameters Regulated
National Primary Drinking Water Requirements (1976)	Physical and chemical
Radionuclides Rule (1976)	Gross alpha and beta emitters, radium-226, and radium-228
Phase I (VOCs) and Phase II and Phase V (IOCs and SOCs) - 1989, 1993, and 1994, respectively	Volatile organic chemicals (VOCs), inorganic chemicals (IOCs), and synthetic organic chemicals (SOCs)
Surface Water Treatment Rule (1990)	Turbidity, disinfection, viruses, Giardia lamblia, and disinfectant residual
Lead and Copper Rule (1992) and Lead and Copper Rule Minor Revisions (2000)	Lead and copper and treatment for corrosion control
Consumer Confidence Rule (1998)	Water quality compliance reporting to customers
Interim Enhanced Surface Water Treatment Rule (1999)	Turbidity and Cryptosporidium
Public Notification Rule (2000)	Notification of public after water quality violation
Stage 1 Disinfectants/Disinfection By-Products Rule (2002)	Disinfectant residual, total trihalomethanes (TTHMs), and haloacetic acids (HAA5)
Radionuclides Rule (2003)	Radionuclides
Arsenic Rule (2006)	Arsenic
Stage 2 D/DBP Rule (2006)	TTHMs, HAA5
Long Term 2 Enhanced Surface Water Treatment Rule (2006)	Cryptosporidium
Unregulated Contaminant Monitoring Rule 2 (UCMR2) (2007)	Monitoring for contaminants included on assessment and screening lists
Revised Total Coliform Rule (2013)	Coliform Bacteria
Unregulated Monitoring Rule 4 (UCMR4) (2016)	Monitoring for contaminants included on assessment and screening lists

6.3 Overview of Drinking Water Regulations and Aberdeen's Compliance

The regulations listed in Table 6-1 have been incorporated into WAC 246-290. The descriptions of these regulations in this section of the water system plan are organized to reflect how they apply to the City's drinking water processes:

- Treatment Regulations – Surface Water Treatment Rule (SWTR), Interim Enhanced SWTR, Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR).
- Finished Water Regulations – Phase I, II, and V Rules (including asbestos which is monitored in the distribution system), Radionuclides Rule, and UCMR4.
- Distribution System Regulations – Total Coliform Rule, Lead and Copper Rule, and Stage 1 Disinfectants/Disinfection By-Products (D/DBP) Rule, Stage 2 D/DBP Rule.
- Consumer Confidence and Public Notification – Consumer Confidence Rule and Public Notification Rule.

The City's compliance with state and federal regulations in each of these categories between 2011 and 2019 is described below.

6.3.1 Treatment Regulations

The Surface Water Treatment Rules apply to drinking water treatment processes. Compliance with these regulations is based on treatment techniques instead of Maximum Contaminant Levels (MCLs).

Surface Water Treatment Rules

Regulatory Requirements

The Surface Water Treatment Rule (SWTR) was issued in 1989 and applies to water systems using surface water or groundwater under the influence of surface water (GUI). The SWTR applies to filtration and disinfection as treatment techniques to regulate the presence of turbidity, *Giardia lamblia*, viruses, *Legionella*, and disinfectant levels in finished drinking water. A minimum three log-removal/inactivation of Giardia (99.9%) and four log-removal/inactivation of viruses (99.99%) are required under this rule.

In addition to treating water to meet removal/inactivation requirements for *Giardia* and viruses, systems must meet performance criteria for turbidity and disinfection. With respect to turbidity, systems must produce water with a turbidity of less than 0.5 nephelometric turbidity units (NTUs) in 95 percent of the samples collected each month. This requirement is superseded by IESWTR requirements discussed later in this section. To meet disinfection performance criteria, systems must provide at least 0.2 milligrams per liter (mg/L) of residual disinfectant at the distribution system entry point and a detectable level of disinfectant must be present throughout the distribution system. WAC 246-290-654 provides compliance guidance pertinent to the

SWTR, and includes operating requirements for filtration treatment plants (coagulation, flocculation, sedimentation and filtration). Finally, the SWTR and WAC 246-290-668 require purveyors to develop and implement a DOH-approved watershed control program.

The Interim Enhanced Surface Water Treatment Rule (IESWTR) was issued in 2001 and builds upon the SWTR without replacing it. The IESWTR strengthened filtration requirements for combined filter effluent turbidity performance, requiring turbidity to be less than 0.3 NTU in at least 95 percent of turbidity measurements per month. The maximum allowable finished water turbidity was established as 1.0 NTU. Finally, the IESWTR requires systems to conduct monitoring of individual filter effluent in addition to combined filter effluent monitoring, and all new finished water storage facilities to be covered.

In addition, the IESWTR establishes a maximum contaminant level goal of zero for *Cryptosporidium* and requires 2-log *Cryptosporidium* removal. If the PWS meets filtered water turbidity criteria, it is assumed to achieve 2-log *Cryptosporidium* removal.

Aberdeen's Status

Aberdeen demonstrates treatment effectiveness for *Giardia lamblia* cyst and *Cryptosporidium* oocysts removal by filtration using the turbidity reduction method specified in WAC 246-290-654. This method requires systems to demonstrate either 1) an 80% reduction in source water turbidity based on an average of daily turbidity reductions for each calendar month; or 2) an average daily filtered turbidity less than or equal to 0.1 NTU.

Aberdeen had no treatment violations between 2011 and 2019 and is in compliance with the Surface Water Treatment Rules.

Long Term 2 Enhanced Surface Water Treatment Rule

The Long Term 2 Enhanced Surface Water Treatment Rule (LT2 Rule) was promulgated in January 2006 and became effective on March 6, 2006. This regulation applies to public water systems using surface water or groundwater under the influence of surface water sources. This rule was developed to protect drinking water consumers from microbiological pathogens, especially *Cryptosporidium*. *Cryptosporidium*, which can be found in surface water supplies, is of particular concern because it can cause cryptosporidiosis, a gastrointestinal illness that can have severe impacts on people with weakened immune systems. Additionally, *Cryptosporidium* is resistant to chlorination.

The rule bolstered prior regulations and provides a higher level of protection of the drinking water supply by:

- Targeting additional *Cryptosporidium* treatment requirements to higher risk systems
- Requiring provisions to reduce risks from uncovered finished water storage facilities
- Ensuring that systems maintain microbial protection as they take steps to reduce the formation of disinfection byproducts.

The LT2 Rule establishes the following types of requirements:

- Two distinct rounds of source water monitoring for Cryptosporidium and *E. coli*
- Profiling and benchmarking requirements
- Treatment technique requirements
- Microbial toolbox for meeting inactivation requirements
- Covering finished water storage facilities
- Sanitary surveys.

Filtered and unfiltered systems must conduct 12 or 24 months of source water monitoring for Cryptosporidium to determine treatment requirements. To reduce monitoring costs, small filtered water systems will first monitor for *E. coli*—a bacterium that is less expensive to analyze than *Cryptosporidium*—and will be monitor for *Cryptosporidium* only if their *E. coli* results exceed specified concentration levels. Bigger water systems need to monitor both *E. coli* and *Cryptosporidium*.

Treatment: Filtered water systems are classified in one of four treatment categories (bins) based on their monitoring results. Most systems are expected to be classified in the lowest bin and will face no additional requirements. Systems classified in higher bins must provide additional water treatment to further reduce Cryptosporidium levels by 90 to 99.7 percent (1.0 to 2.5-log), depending on the bin. Systems will select from different treatment and management options in a “microbial toolbox” to meet their additional treatment requirements. All unfiltered water systems must provide at least 99 or 99.9 percent (2 or 3-log) inactivation of Cryptosporidium, depending on the results of their monitoring.

Uncovered Finished Water Reservoirs: Systems that store treated water in open reservoirs must either cover the reservoir or treat the reservoir discharge to inactivate 4-log virus, 3-log *Giardia lamblia*, and 2-log *Cryptosporidium*. These requirements are necessary to protect against the contamination of water that occurs in open reservoirs.

Disinfection Benchmarking: Systems must review their current level of microbial treatment before making a significant change in their disinfection practice. This review will assist systems in maintaining protection against microbial pathogens as they take steps to reduce the formation of disinfection byproducts under the Stage 2 Disinfection Byproducts Rule, which EPA is finalizing along with the LT2ESWTR.

Monitoring starting dates are staggered by system size. The largest systems (serving at least 100,000 people) began monitoring in October 2006 and the smallest systems (serving fewer than 10,000 people) began monitoring in October 2008. After completing monitoring and determining their treatment bin, systems generally have three years to comply with any additional treatment requirements. Systems must conduct a second round of monitoring six years after completing the initial round to determine if source water conditions have changed significantly.

Systems that are consecutive systems, purchasing some or all of their water from another system, and systems that sell water wholesale must comply with the LT2 Rule on the same schedule based on the largest system in the combined distribution system. A combined distribution system consists of the interconnected wholesale systems and consecutive systems that receive finished water from those wholesale system(s).

Aberdeen's Status

The City of Aberdeen began source water (untreated) monitoring for Cryptosporidium, E. coli, and turbidity on April 8, 2008, and concluded on March 9, 2010. Following the 24 months of sampling, the City calculated the initial Cryptosporidium bin concentration and reported the initial bin classification to DOH on July 28, 2010.

A second round of source monitoring is required as part of the LT2ESWTR. The sampling plan for round two was due July 1, 2016, and sampling must start by October 1, 2016.

Table 6-2. Timeline for LT2 Compliance

Milestone	Date (for Schedule 3 Water System)	City's Status
Submit E. coli monitoring results for data to have grandfathered	June 1, 2008	None Submitted
Complete initial round of E. coli monitoring and assess bin classification	March, 2010	Complete
Begin second round of monitoring for E. coli and re-assess bin classification	October 1, 2016	Complete

6.3.2 Finished Water Regulations

The Phase I, II, and V, Radionuclides, and Unregulated Contaminant Monitoring Rules apply to drinking water after it has been treated (except for asbestos, which is regulated under Phase II and is actually monitored in the distribution system). With the exception of the Unregulated Contaminant Monitoring Rule, these regulations establish Maximum Contaminant Levels (MCLs) for inorganic chemicals, synthetic and volatile organic chemicals, and radionuclides.

Phase I, II, and V Rules

Regulatory Requirements

Monitoring requirements and MCLs for inorganic (IOC), synthetic organic (SOC), and volatile organic (VOC) chemicals are addressed by federal Organic, Synthetic Organic and Inorganic Chemicals Phases I, II, and V Rules and WAC 246-290-300. Under Phases II and V, MCLs are

set for 16 inorganic, 30 synthetic, and 21 volatile organic contaminants. Required testing is determined by DOH based on a vulnerability assessment. WAC 246-290-300 requires monitoring of IOCs, VOCs, and SOCs at each source on 12- to 36-month sampling cycles, depending on the contaminant and source type.

Inorganic chemicals are monitored after treatment, before entering the distribution system. Systems that have a significant amount of asbestos-cement piping must monitor for asbestos once every nine years. Nitrate and nitrite are measured each year and monitoring cannot be waived.

With respect to SOCs, systems are required to conduct monitoring twice every three years after treating the water and before it enters the distribution system, unless DOH issues waivers.

VOC samples are collected once per year after treatment and before the water enters the distribution system.

Aberdeen's Compliance Status

Inorganic Chemicals (IOCs)

The City continues to monitor for inorganic chemicals annually. No exceedance was observed between 2011 and 2019.

Synthetic Organic Chemicals (SOCs)

SOCS include testing for herbicides (test method 515.1), pesticides (test method 525.2), and carbamates (test method 531.1). DOH regulations require that the SOC sample location be located from a point representative of the source after treatment and prior to entry to the distribution system. No exceedance was observed between 2011 and 2019.

Volatile Organic Chemicals (VOCs)

The testing for VOCs, which began in 1989, included eight chemicals. Phase II increased the requirements to 18 contaminants. This group includes solvents, degreasers, and industrial chemicals. The frequency for VOC sampling is one per year.

Aberdeen is required to sample for VOCs every 6 years. The most recent sample was collected in 2017. No exceedance was observed.

Radionuclides

Regulatory Requirements

The Radionuclide Rule includes MCLs for the sum of radium-226 and radium-228 (5 pCi/L), adjusted gross alpha emitters (15 pCi/L), gross beta and photon emitters (4 millirems per year [mrem/year]), and uranium (0.03 mg/L). Systems are required to conduct initial monitoring between 2003 and 2007, unless earlier radionuclide data can be used as grandfathered data. Under the new rule, monitoring for radionuclides must be conducted at each entry point to the

distribution system. The required monitoring frequency will depend on system contaminant levels seen during initial monitoring.

Aberdeen's Compliance Status

Aberdeen's current monitoring frequency is one sample every 6 years. The most recent sampling event took place in 2016. No exceedance was observed.

Arsenic Rule

The original arsenic MCL of 0.05 mg/L was established as part of the 1975 National Interim Primary Drinking Water Regulations. After additional health effects research and cost/benefit analysis, the USEPA published the final Arsenic Rule in January 2001. The rule, which became effective January 2006, revises the arsenic MCL downward to 0.010 mg/L and identifies several best available treatment technologies (BATs) for compliance. Compliance with the new MCL is based on the running annual average of monitoring results at each entry point to the distribution system. The rule makes arsenic monitoring requirements consistent with monitoring for other IOCs regulated under the Phase II/V standardized monitoring framework. However, if arsenic is detected above the MCL in any individual sample, the system must increase the frequency of monitoring at that sampling point to quarterly monitoring.

Aberdeen's Status

The City's IOC monitoring has not found detectable levels of arsenic in the source of supply.

Unregulated Contaminant Monitoring Rule 4 (UCMR4)

USEPA issued the UCMR4 in 2016, with requirements that were effective from 2018 through 2020. The UCMR4 required systems to conduct monitoring for specified contaminants to investigate their occurrence. All systems serving more than 10,000 persons are required to monitor for 10 List 1 cyanotoxins during a 4-consecutive-month period from March 1, 2018, to November 31, 2020. All systems serving more than 10,000 persons will also be required to monitor for 20 List 1 additional contaminants during a 12-month period between January 1, 2018, and December 31, 2020. The 20 List 1 additional contaminants consist of metals, pesticides, HAA, alcohols, semivolatile chemicals, and indicators.

Aberdeen's Status

The City completed UCMR 4 monitoring between August 2018 and 2019 per the following schedule:

1. AM1 samples were taken **quarterly** from our Filtration Plant between November 2018 and August 2019.
2. AM2 samples were taken **quarterly** from our Raw Water source and 2 distribution system locations between November 2018 and August 2019.
3. AM3 samples were taken **twice quarterly**, week 1 and week 3, from our Filtration Plant between August 2018 until November 2018.

6.3.3 Distribution System Regulations

The Total Coliform, Stage 1 Disinfectant/Disinfection By-products, and Lead and Copper Rules apply primarily to the quality of drinking water present in the distribution system. These regulations establish monitoring, MCLs, Maximum Residual Disinfectant Levels (MRDLs), and action levels for regulated parameters.

Total Coliform Rule

Regulatory Requirements

USEPA published the Revised TCR on February 13, 2013, with minor corrections in February 2014. The RTCR is the revision to the 1990 TCR and is intended to improve public health protection. The TCR requires systems to monitor their distribution systems for coliforms. Key provisions of the RTCR include:

- Setting a maximum contaminant level goal (MCLG) and MCL for E. coli for protection against potential fecal contamination
- Setting a total coliform treatment technique (TT) requirement
- Requirements for monitoring total coliforms and E. coli according to a sample siting plan and schedule specific to the PWS
- Provisions allowing PWSs to transition to the RTCR using their existing TCR monitoring frequency, including PWSs on reduced monitoring under the existing TCR
- Requirements for seasonal systems to monitor and certify the completion of state-approved startup procedures
- Requirements for assessments and corrective action when monitoring results show that PWSs may be vulnerable to contamination
- Public notification (PN) requirements for violations
- Specific language for community water systems (CWSs) to include in their CCRs when they must conduct an assessment or if they incur an E. coli MCL violation

Aberdeen's Status

The City is required to collect a minimum of 20 samples per calendar month. These samples, analyzed for total coliform, must be collected at locations representative of each pressure zone. The City was in compliance with the TCR for the 2011 to 2019 period.

One coliform sample on March 12, 2013 was Total Coliform Present. There have been no other positive coliform samples between 2011 and 2019.

Stage 1 Disinfectant and Disinfection By-Products Rule

Regulatory Requirements

Disinfection byproducts (DBPs) result from the reaction of natural organic matter (NOM) and various inorganic precursors with chemical disinfectants. Some DBPs, such as trihalomethanes,

have been shown to cause cancer and negative reproductive health effects. The Stage 1 DBPR is the first of a staged set of rules that will reduce the allowable levels of DBPs in drinking water.

Disinfection byproduct sampling requirements began in 1979 with the Total Trihalomethanes (TTHMs) Rule, which had a Maximum Contaminant Level (MCL) for TTHMs of 100 µg/L based on a running annual average of samples collected within the distribution system. TTHMs is the summation of chloroform, bromodichloromethane, dibromochloromethane, and bromoform. This rule was replaced by with the Stage 1 DBP Rule in 2001. In 2004, the federal Stage 1 Disinfectant/Disinfection By-Product Rule came into effect for surface water systems with less than 10,000 customers, and the TTHM MCL was reduced from 100 to 80 µg/L and an MCL was added for the total of five haloacetic acids (HAA5) at 60 µg/L.

The HAA5 MCL applies to the summation of five HAAs: monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, bromoacetic acid, and dibromoacetic acid. Both MCLs are based on a running annual average of quarterly samples collected within the distribution system. Systems are required to collect samples based on water system type (surface or groundwater) and number of treatment plants, and are required to develop a DBP monitoring plan.

Finally, the Stage 1 DBP Rule established a Maximum Residual Disinfectant Level (MRDL) for chlorine of 4.0 mg/L, to be sampled at the same locations and frequency as TCR sampling. As adopted in WAC 246-290, the Stage 1 DBP requirements were applied only to systems that add a disinfectant to the drinking water supply.

The Rule also uses a treatment technique to reduce disinfection byproduct precursors and to minimize the formation of unknown DBPs. This treatment technique is termed Enhanced Coagulation or Enhanced Precipitate Softening. It requires that a specific percentage of influent total organic carbon (TOC) be removed during treatment.

Systems should also strive to meet at least one of the “alternative compliance criteria” if their filter plant cannot achieve the specific TOC removal. The treatment technique uses TOC as a surrogate for natural organic matter, the precursor material for DBPs.

To maximize the probability of remaining in compliance, staff at a conventional treatment plant should monitor and track all possible water quality parameters specified in the alternative compliance criteria. In addition, the system should also calculate the percent removal of TOC between the raw water and the treated water. The percent removal of TOC is called “Step 1.”

The specific percentages of TOC removal required under Step 1, through an enhanced coagulation process, must occur between the raw water monitoring point and the treated water monitoring point (also called “post-sedimentation”). The required removal of TOC ranges from a 15 percent reduction to as high as a 50 percent reduction. These percentages depend on the source water TOC and the source water alkalinity levels at the time of sampling. The percentage of TOC removal is calculated monthly. Since source water conditions will change throughout the year, the removal requirements will likely change from month to month. Table 6-3, also called the “3-by-3 matrix,” shows these TOC removal percentages:

Table 6-3. Source Water TOC Matrix

Source Water TOC (mg/L)	Source Water Alkalinity (mg/L)		
	0-60 mg/L	>60-120 mg/L	>120 mg/L
>2.0 to 4.0	35%	25%	15%
>4.0 to 8.0	45%	35%	25%
>8.0	50%	40%	30%

mg/L == milligrams per liter

TOC = total organic carbon

If the plant values fall within the table above, the filter plant has met the Step 1 requirements for that month. However, overall compliance cannot be determined until a running annual average has been completed.

The system is not required to remove TOC if they can meet one of the following six “alternative compliance criteria”:

1. If the source water TOC is less than 2.0 mg/L (based on a running annual average) or
2. If the treated water TOC is less than 2.0 mg/L (based on a running annual average) or
3. If the source water Specific Ultraviolet Absorbance (SUVA) values are 2.0 L/mg-m or less (annual average) or
4. If the treated water SUVA values are 2.0 L/mg-m or less (annual average) or
5. If the Total Trihalomethane (TTHM) levels are 0.040 mg/L or less and Haloacetic Acids (HAA5) levels are 0.030 mg/L or less (annual averages) and the system uses only chlorine for primary and residual disinfection or
6. If the following three running annual averages are met: source water TOC is 4.0 mg/L or less, the source alkalinity is >60 mg/L, and the distribution system TTHM levels are 0.040 mg/L or less and HAA5 levels are 0.030 mg/L or less.

In relation to the sixth alternative compliance criteria (listed above), if the system meets these TOC and alkalinity levels but not the TTHM and HAA5 levels, they may choose to make a clear and irrevocable financial commitment to use technologies that limit TTHM to 0.040 mg/L or less and HAA5 0.030 mg/L or less.

If a water system cannot meet the required annual averages for TOC removal or the alternative compliance, DOH must approve the system’s request for “Step 2.” This is also called the “alternative minimum TOC removal” requirement. Step 2 is a series of quarterly jar tests conducted over a year to determine the best possible TOC removal.

A system must apply for Step 2 requirements within 3 months of not meeting Step 1 requirements. Systems cannot apply for Step 2 without collecting at least one full year of TOC and alkalinity data as outlined under Step 1. The reference of step 2 is in Chapter 3 of EPA’s “Enhanced Coagulation and Enhanced Precipitate Softening Manual.”

Aberdeen's Status

The City chlorinates before the clearwell at the outlet of the WTP. The clearwell provides the detention time necessary to comply with disinfection requirements of the SDWA. The City currently collects a quarterly sample at 1700 Block of Coolidge Rd, representing maximum residence time and tests for TTHMs and HAAs. The City developed a Disinfection By-Products Monitoring Plan which is included in Appendix G.

Since initiating monitoring in 2005, there have been no samples of total HAAs or TTHMs that exceeded the MCL.

Stage 2 Disinfection/Disinfection By-Products Rule

The final Stage 2 DBP Rule was promulgated on January 4, 2006. The Stage 2 D/DBP Rule has been developed by the USEPA to further reduce exposure to DBPs linked to bladder, rectal, and colon cancers. This rule applies to community water and nontransient, noncommunity water systems that serve drinking water treated with a primary or secondary disinfectant other than ultraviolet (UV) treatment. The Stage 2 Rule does the following:

- Changes the method of calculating DBP regulatory compliance to a locational running annual average (LRAA) of quarterly samples, in which the system calculates a running annual average for each DBP monitoring location instead of calculating a running annual average for the entire system.
- Re-establishes the location and number of DBP monitoring sites. The rule requires systems to conduct an Initial Distribution System Evaluation (IDSE) to select Stage 2 DBP monitoring locations in areas of the distribution system with elevated DBP levels. Additionally, the final Stage 2 DBP Rule requires systems to determine monitoring requirements based on retail population.
- Establishes DBP operational evaluation levels. Systems are to calculate a system-specific operational evaluation level which provides early warning, indicating a system could exceed the MCL within the next year. A system with an operational evaluation level greater than the MCL is required to conduct an operational evaluation, i.e., evaluating their distribution system operations to determine ways to reduce DBP levels. The system is required to notify the State of an operational evaluation level exceedance and submit evaluation results within 90 days of the exceedance. Consecutive systems that purchase drinking water carrying a disinfectant are required to implement Stage 2 DBP requirements on the same schedule as the largest water system in their combined distribution system.

The first step in complying with the Stage 2 D/DBP Rule is conducting an IDSE. The goal of the IDSE is to identify areas that have routinely higher DBP concentrations than other areas in the distribution system and use this information to select monitoring locations for long-term Stage 2 D/DBP compliance monitoring. The IDSE requirement can be met in four ways:

1. *Very Small System Waiver* – Systems serving less than 500 customers that qualify for this waiver are exempt from IDSE requirements.
2. *40/30 Certification* – This approach allows systems to meet the IDSE requirement by certifying that all individual Stage 1 total trihalomethanes (TTHM) and haloacetic acids (HAA5)

compliance monitoring results or equivalent DBP data collected over a specified 2-year period have met the following criteria:

$$\begin{aligned} \text{TTHM} &\leq 40 \text{ }\mu\text{g/L} \\ \text{HAA5} &\leq 30 \text{ }\mu\text{g/L} \end{aligned}$$

Systems must submit the required documentation to the primacy agency.

3. *Standard Monitoring Program (SMP)* – Systems conduct 1 year of monitoring in the distribution system to identify high DBP locations. Systems must submit an SMP plan and IDSE report to the primacy agency as part of the IDSE process.
4. *System Specific Study (SSS)*-
 - **SSS Using Existing Monitoring Data** - Systems can meet IDSE requirements using existing monitoring data. The USEPA has established criteria that the existing data must meet in order to be used to meet the SSS requirement. Systems must submit an SSS plan and/or IDSE report to the primacy agency as part of the IDSE process.
 - **SSS Using Hydraulic Model** - Systems can meet IDSE requirements using a water distribution system hydraulic model. The USEPA has established criteria that the hydraulic model must meet in order to be used for IDSE compliance. Systems must submit an SSS plan and IDSE report to the primacy agency as part of the IDSE process.

Systems that are consecutive systems, purchasing some or all of their water from another system, and systems that sell water wholesale must comply with the Stage 2 Rule on the same *schedule* based on the largest system in the combined distribution system. A combined distribution system consists of the interconnected wholesale systems and consecutive systems that receive finished water from those wholesale system(s). However, Stage 2 *sampling requirements* are based on the retail population served by each individual system, not on the combined distribution system.

Aberdeen's Status

The City applied for a 40/30 Certificate based on their Stage 1 TTHMs and HAAs compliance monitoring results. The City was granted the certification and was not required to submit an IDSE report.

Lead and Copper Rule

Regulatory Requirements

Lead and copper are metals that may be found in household plumbing materials and water service lines. Lead can cause a variety of negative health impacts, including delaying physical and mental development in infants and children. Copper can cause aesthetic issues in addition to short-term and long-term negative health impacts.

The Lead and Copper Rule (LCR) establishes action levels, monitoring, and compliance requirements for lead and copper levels at customers' taps. To meet the established action

levels, 90 percent of all samples must have lead levels equal to or less than 0.015 mg/L and copper levels equal to or less than 1.3 mg/L. If these action levels cannot be met, systems must implement public education and a corrosion control treatment strategy for meeting these levels.

In 2004, the EPA initiated a review of LCR implementation across the nation. This effort was focused on determining whether national lead levels are increasing. As a result of this effort, the EPA identified several targeted changes to the existing regulation that would meet short-term goals for improving implementation of the LCR. These revisions, which were finalized in October 2007 and became effective in December 2007, are intended to enhance LCR implementation in the areas of monitoring, treatment, customer awareness, and lead service line replacement. Additionally, these revisions focus on improving compliance with public education requirements to ensure that consumers receive meaningful and timely information that assists in limiting exposure to lead in drinking water. Table 6-4 provides a summary of the LCR revisions.

Table 6-4. 2007 Lead and Copper Rule Revisions

Activity	Rule Revision
Monitoring	<ul style="list-style-type: none"> Clarify language in the rule regarding the number of samples required and the number of sites from which samples should be collected. Modify definitions for monitoring and compliance periods to make it clear that all samples must be taken in the same calendar year. Clarify the reduced monitoring criteria that would prevent small and medium water systems above the lead action level or large systems deemed to no longer meet Optimum Corrosion Control Treatment from remaining on a reduced monitoring schedule.
Treatment or Source Water Changes	<ul style="list-style-type: none"> Requires water systems to provide advanced notification to the primacy agency of intended changes in treatment or source water that could impact long-term water quality. The primacy agency must approve the planned changes using a process that will allow the states and water systems to take as much time as needed for systems and states to consult about potential problems.
Customer Awareness and Public Education	<ul style="list-style-type: none"> Requires utilities to provide a notification of tap water monitoring results for lead to owners and/or occupants of homes and buildings that are part of the utility's sampling program. Changes to the content, delivery, and time frame of public education regarding lead action level exceedances. Systems must partner with additional organizations to disseminate the message to at-risk populations. Requires educational statements about lead in drinking water to be included in all Consumer Confidence Reports.
Lead Service Line Replacement	<ul style="list-style-type: none"> Requires utilities to reconsider previously "tested-out" lead service lines when resuming lead service line replacement programs.

Aberdeen's Status

The City is on a standard 3 year monitoring frequency schedule. Each monitoring event requires 30 samples. Sampling was conducted in June of 2012, 2015, and 2018. A list was compiled of the 30 sample sites and the results from each location, along with the 90th percentile for both

Lead and Copper. None of the samples during any of the three events exceeded the Action Level for neither lead (0.015 mg/L) nor Copper (1.3 mg/L). Table 6-5 displays the MCL and 90th percentile values for LCR sampling.

Table 6-5. Lead and Copper Regulatory Levels and Monitoring Results (90th Percentiles)

Parameter	MCL (mg/L)	2012 (mg/L)	2015 (mg/L)	2018 (mg/L)
Lead	0.015	0.002	0.004	<0.001
Copper	1.3	0.09	0.27	0.21

6.3.4 Consumer Confidence and Public Notification Rules

The Consumer Confidence and Public Notification Rules require systems to provide customers with water quality information on an annual basis, and when a regulatory violation occurs.

Regulatory Requirements

Under the Consumer Confidence Report (CCR) Rule promulgated in 1998, community water systems are required to provide an annual CCR on the source of their drinking water and levels of any contaminants found. The annual report must be supplied to all customers and must include:

- Information on the source of drinking water.
- A brief definition of terms.
- If regulated contaminants are detected: the maximum contaminant levels goal (MCLG), the maximum contaminant level (MCL), and the level detected.
- If an MCL is violated: information on health effects.
- If the USEPA requires it: information on levels of unregulated contaminants.

While the CCR provides an annual “state-of-the-water” report, the Public Notification Rule (PNR) directs utilities in notifying customers of acute violations when they occur. The PNR was revised in May 2000 and outlines public notification requirements for violations of MCLs, treatment techniques, testing procedures, monitoring requirements, and violations of a variance or exemption. If violations have the potential for “serious adverse effect,” consumers and the State must be notified within 24 hours of the violation. The notice must explain the violation, potential health effects, corrective actions, and whether consumers need to use an alternate water source. Notice must be made by appropriate media or posted door-to-door. Less serious violations must be reported to consumers within 30 days in an annual report, or by mail or direct delivery service within 1 year, depending on the severity of the violation.

Aberdeen's Status

The City distributes CCRs on an annual basis. The CCR summarizes the water quality in the system and is compliant with DOH guidelines. A copy of the City's 2019 CCR is provided in Appendix H.

6.3.5 Recently Promulgated and Anticipated Drinking Water Regulations

Additional applicable regulations are anticipated over the next several years. Table 6-6 presents a list of anticipated regulations, dates (some anticipated) of regulatory milestones, and regulated parameters. In addition to these anticipated regulations, the City can track potential regulations by keeping up-to-date with the Contaminant Candidate List (CCL). The CCL is the primary source used by the USEPA for establishing priority contaminants that may face future regulation. In November 2016, the USEPA issued the second CCL, which is comprised of 97 chemicals or chemical groups and 12 microbial contaminants.

Table 6-6. Recently Promulgated and Anticipated Drinking Water Regulations

Regulation	Anticipated Date	Parameters
Unregulated Contaminant Monitoring Rule 5 (UCMR5)	Proposed: 2020 Final: 2021 Effective: late 2021	Various parameters
Long-Term Lead and Copper Rule Revisions	Final: 2020 Effective: late 2020	Affects how system implement monitoring and other activities
Per- and Poly-Fluoroalkyl Substances (PFAS)	Monitoring requirements for PFOA and PFOS; potential future requirements for other PFAS	TBD

Unregulated Contaminant Monitoring Rule 5

It is anticipated that USEPA will propose a fifth Unregulated Contaminant Monitoring Rule 5 (UCMR5) in 2020, with the final rule being published in late 2021. UCMR5 will likely include two lists of contaminants for which some systems will be required to monitor. All PWSs serving more than 10,000 people (including both retail and wholesale customers) will be required to conduct assessment monitoring at distribution system entry points for 11 contaminants on the Assessment Monitoring List. Systems serving more than 100,000 people (including both retail and wholesale customers) and selected smaller systems will be required to conduct screening monitoring for 15 contaminants on the Screening Survey List. This list includes contaminants

that will be monitored at distribution system entry points and within the distribution system. This monitoring will be required during a 12-month period between 2023 and 2025.

Aberdeen's Status

Aberdeen will be required to conduct monitoring for contaminants on the Asset Monitoring List.

Long-Term Lead and Copper Rule Revisions

USEPA released the proposed Revisions to the LCR in October 2019; the revisions are expected to be published in 2020. The proposed revisions include actions to reduce lead exposure in drinking water and identify the most at-risk communities to ensure that systems have plans in place to rapidly implement actions to reduce elevated levels of lead in drinking water. The proposed revisions focus on the following six key areas to improve the current rule:

- Identifying areas most impacted
- Strengthening treatment requirements
- Replacing LSLs
- Increasing sampling reliability
- Improving risk communication
- Protecting children in schools

Per- and Poly-Fluoroalkyl Substances

PFAS are a group of man-made chemicals manufactured and used in a variety of industries since the 1940s. The EPA initially established a provisional lifetime health advisory level (HAL) for perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) in 2009. Six PFAS were included in the third Unregulated Contaminant Monitoring Rule (UCMR 3). The two most frequently detected PFAS during UCMR 3 were PFOS and PFOA. As a result, the EPA replaced the provisional HAL with a formal HAL for these two compounds, individually or combined, of 70 nanograms per liter (ng/L) in 2016.

The EPA developed a PFAS Action Plan in February 2019 with seven goals:

1. Conduct the Maximum Contaminant Level (MCL) process for PFOS and PFOA, and evaluate information to determine if a broader class of PFAS should be regulated.
2. Strengthen enforcement authorities and clarify cleanup strategies by designating PFOS and PFOA as hazardous substances and develop interim groundwater cleanup recommendations.
3. Determine if PFAS should be added to the Toxics Release Inventory and if rules to prohibit the use of certain PFAS should be developed.
4. Include additional PFAS in UCMR 5 that were not previously part of UCMR 3.
5. Increase research related to PFAS, including improved detection and measurement methods.
6. Utilize EPA enforcement tools, when necessary, to address PFAS exposure in the environment and assist states in enforcement activities.

7. Develop a risk communication toolbox for federal, state, tribal, and local partners to use with the public.

In February 2020, EPA announced that it is proposing to regulate PFOS and PFOA under the Safe Drinking Water Act (SDWA). EPA is seeking information related to other PFAS and comments on potential monitoring requirements and regulatory approaches for PFAS. If a positive regulatory determination is finalized, EPA would begin the process for establishing a National Primary Drinking Water Regulation for PFOS and PFOA.

6.4 Labs Used for Sample Analyses

The City uses four laboratories to perform water quality testing. Except for Lab/Cor, Inc., these laboratories are certified by the DOH drinking water laboratory certification program for analyses methods. Lab/Cor, Inc. has EPA approval for conducting EPA Method 1623 for *Giardia* and *Cryptosporidium* analysis. The contact information is listed below.

Water Management Laboratories

1515 80th St. E
Tacoma, WA 98404
Phone: 253-531-3121

Grays Harbor County Drinking Water Lab

100 W. Broadway
Suite 31
Montesano, WA 98563
Phone: 360-249-4413

Lab/Cor, Inc.

7619 6th Ave. NW
Seattle, WA 98117
Phone: 888-522-2674

Washington State Public Health Laboratory

1610 NE 150th St
Shoreline WA 98155
Phone: 206-418-5486

6.5 Response to Customer Inquiries and Complaints

The City keeps good documentation of all orders that are generated by a customer call to Public Works. When a call for inquiry or complaint received, the information is disseminated from the Public Works office to the WTP. Depending on the nature of the issue, a work order is generated to deal with the situation. In case of a water taste, smell, color or odor complaint, actions are initiated as soon as possible within the next available time line. Usually it turns out to be a water filter system in a customer's home making the odor or smell.

6.6 Summary of Regulatory Status and Monitoring Requirements

A review of the City's monitoring and compliance procedures and water quality monitoring results indicates that Aberdeen was in full compliance with all State and Federal regulations during the review period. Table 6-7 summarizes the City's regulatory status from 2011-2019, including regulatory requirements and recommendations for continued compliance.

A summary of water quality monitoring requirements is described in the City's Water Quality Monitoring Schedule (WQMS) in Appendix I.

Table 6-7. Summary of Applicable Regulations and Compliance Status

Regulation	Requirements	Status	Compliance?	Recommendations
Surface Water Treatment Rules	Operate treatment such that removal credit requirements are met. Meet turbidity performance criteria Monitor chlorine residuals throughout the distribution system. Maintain Watershed Control Plan.	Aberdeen operates the Water Treatment Plant in a manner to meet removal requirements. Aberdeen has met turbidity and chlorine requirements. Aberdeen has a documented watershed control program.	Yes	Continue with existing monitoring. Maintain an updated watershed control plan.
Phase I, II, V Rules	Monitor finished water for IOCs, SOCs, and VOCs. Monitor distribution system for asbestos.	Conducted required monitoring.	Yes	Continue with existing monitoring.
Radionuclide Rule	Monitor for regulated radionuclides.	Conducted required monitoring.	Yes	Monitor per requirements established by DOH.
UCMR	Monitor for listed contaminants.	Conducted required monitoring.	Yes	Continue with existing monitoring.
UCMR 2	No Required monitoring for systems <10,000 people	Conducted required monitoring.	Yes	Continue with existing monitoring.
UCMR 4	Monitored for listed contaminants	Conducted required monitoring.	Yes	Continue with existing monitoring.
Revised Total Coliform Rule	Written Plan; Monitoring.	Conducted required monitoring and has plan.	Yes	Continue with existing monitoring.

Regulation	Requirements	Status	Compliance?	Recommendations
Stage 1 D/DBP Rule	Written Plan; Monitoring.	Monitors at four distribution system locations quarterly, has levels below MCL, and has developed a plan.	Yes	Continue with existing monitoring.
Stage 2 D/DBP Rule	Written Plan, Monitoring	Granted a 40/30 certificate.	Yes	Continue with existing monitoring.
Lead and Copper Rule	Written Plan; Monitoring.	Monitors as part of regional program. Meets action levels.	Yes	Continue with existing monitoring.
CCR and Public Notification Rules	Annual Reports. Reporting as needed.	Consumer Confidence Reports published annually.	Yes	Continue with existing reporting.
Arsenic Rule	Monitor for Arsenic	Conducted required monitoring.	Yes	Continue with existing reporting.

7. System Analysis

This chapter provides an evaluation of the City's ability to meet current and projected water supply needs. Source and storage capacity analyses are presented, followed by an evaluation of the distribution system piping network. System deficiencies are described throughout the chapter, and how they relate to capital improvements presented in Chapter 9.

Table 7-1. System Capacity Summary

Average Day Demand (ERU _{ADD}): 146			
Maximum Day Demand (ERU _{MDD}): 234			
Water System Connections Correlated to ERUs (2019)			
Service Classification	Total MDD for the Classification (gal)	Total # of Connections in the Classification	ERUs
Single Family Residential	1,111,646	4,749	4,749
Duplex Residential	70,104	184	299
Multifamily	225,994	189	956
Irrigation	12,966	22	55
Commercial	996,991	599	4,259
Outside City Limits	120,765	322	516
Multiplexes Exempt of Excise Tax	193,004	37	825
City Facilities	383,520	51	1638
Non-Revenue	1,232,784	N/A	5,267
Total Existing ERUs (Consumption + Non-Revenue)			18,574
Service Capacity as ERUs and Gallons Per Day			
Water System Component	ERU Capacity for Each Component	Capacity for Each Component	
Sources(s) ¹	N/A	N/A	
Treatment ²	23,140	6,500,000 gpd	
Storage ³	83,510	23,639,846 gallons	
Transmission	32,051	7,500,000 gpd	
Water Rights (Qa and Qi)	Qa – 244,587 Qi – 151,914	Qa – 35,709,770 gpd Qi – 35,547,840 gpd	
Water System Service Capacity (ERUs) = Based on limiting water system components shown above		23,140	

¹Previous studies have shown that the watershed yield is sufficient to meet the projected demands. Therefore, treatment capacity will always be the limiting factor between sources and treatment.

²Based on ability to meet MDD during 20 hour production.

³Based on maximum ERUs that could be served without a deficiency at 20 psi (i.e., operation storage + equalizing storage + the larger of standby or fire flow storage).

7.1 Source Capacity Analysis

7.1.1 Design Criteria

According to DOH planning requirements, sources of supply must be sufficient to meet maximum day demands (MDD). This must hold true for each pressure zone within a system, as well as for the system as a whole. Section 7.3.3 describes how forecasted demands were allocated to the pressure zones. For any “closed” pressure zone (i.e., a zone that has no storage, and for which pressure is maintained by pumping), sources must be sufficient to meet peak hour demands (PHD). The source capacity analyses presented below examine the ability of the City’s existing sources of supply to meet these requirements. Table 7-2 through Table 7-6 summarize the evaluation of source capacities for the City’s total system and the Herbig Heights, North Aberdeen, Bench Drive, and Wishkah zones respectively. These analyses are conducted by comparing the City’s water demand forecast, presented in Chapter 3, with current source capacities. Each zone is evaluated for three level of service source capacity criteria:

- Ability of sources to meet MDD with 20 hour production
- Ability of sources to meet MDD and replenish fire suppression storage in 72 hours at 24 hour production
- Ability of sources to meet ADD at 20 hour production with the largest source offline

7.1.2 Source Capacity Evaluation

Total System

The City’s water treatment plant is the sole source of water into the distribution system. The current rated capacity of the plant is 6.5 mgd based on the capacity of the filters. Based on demand projections developed in Chapter 3, the treatment plant can provide a sufficient quantity of water to meet the maximum day demand through 2040. However, if the water demand increases beyond the capacity of the plant, additional filters may be installed to increase the production capacity of the plant.

While the treatment plant capacity is the limiting condition in this analysis, there are two other factors to consider: the transmission main capacity and the watershed yield. Section 1.5.1 describes the capacity of the gravity transmission main based on a hydraulic analysis conducted in a prior water system plan. The transmission main is rated with a capacity of 7.5 mgd. Previous studies have shown that the watershed yield is sufficient to meet the projected demands.

Table 7-2. Source Capacity Analysis for the Total System

	Year			
	2020	2030	2040	Max ⁴
Projected ERUs and Demand ⁽¹⁾				
Equivalent Residential Units (ERU's)	20,382	20,621	20,876	23,140
Average Day Demand (gpd)	2,981,927	3,016,785	3,054,198	3,385,417
Maximum Day Demand (gpd)	4,771,084	4,826,856	4,886,717	5,416,667
Flow to replenish Fire Flow storage in 72 hrs. (gpd)	180,000	180,000	180,000	180,000
<i>Evaluation of Existing Sources</i>				
Available Existing Source (gpd) ⁽²⁾				
Water Treatment Plant (6,500,000 gpd)				
Membrane Filtration Module #1 (gpd)	812,500	812,500	812,500	812,500
Membrane Filtration Module #2 (gpd)	812,500	812,500	812,500	812,500
Membrane Filtration Module #3 (gpd)	812,500	812,500	812,500	812,500
Membrane Filtration Module #4 (gpd)	812,500	812,500	812,500	812,500
Membrane Filtration Module #5 (gpd)	812,500	812,500	812,500	812,500
Membrane Filtration Module #6 (gpd)	812,500	812,500	812,500	812,500
Membrane Filtration Module #7 (gpd)	812,500	812,500	812,500	812,500
Membrane Filtration Module #8 (gpd)	812,500	812,500	812,500	812,500
Total Available Source; 24 hour operation (gpd)	6,500,000	6,500,000	6,500,000	6,500,000
Total Available Source; 20 hour operation (gpd)	5,416,667	5,416,667	5,416,667	5,416,667
Total Available Source; 20 hour operation; Largest Source Offline (gpd)	4,739,583	4,739,583	4,739,583	4,739,583
Source Surplus/(Deficiency)				
MDD; 20 hour production	645,583	589,811	529,950	0
MDD + FSS⁽³⁾; 24 hour production	1,548,916	1,493,144	1,433,283	903,333
ADD; 20 hour production with largest source offline	967,726	932,868	895,455	564,236

¹Projected demands taken from Chapter 3. ERUs calculated as Average Day Demand / ERU water use factor (146 gpd/ERU).

²Water Treatment Plant is operating at maximum production rate limited by filtration capacity.

³Fire suppression storage is 3,000 gpm for 3 hours, or 540,000 gallons.

⁴Maximum ERUs to be served with current sources based on limiting level of service calculation.

Boosted Pressure Zones

Source capacity evaluations were conducted independently for each of the City's boosted pressure zones, which are supplied water through booster pump stations. Table 7-3 through Table 7-6 present the results of these analyses. Because the Herbig Heights, North Aberdeen, and Wishkah Zones are "open" zones and have storage reservoirs that provide for equalization to aid in meeting peak hour demands, source capacities in these zones are compared against MDD. By contrast, the Bench Drive Zone is a "closed" zone, meaning there is no storage

present to support any portion of demand. Therefore, source capacities in this zone are compared against PHD.

In each case, existing source capacities at the pump stations are sufficient to meet current and projected demands. Therefore, no source capacity improvements are identified to address any such deficiencies.

**Table 7-3. Source Capacity Analysis for the Herbig Heights Zone
Evaluation of Source Adequacy for Herbig Heights Zone**

	Year			
	2020	2030	2040	Max ⁽⁵⁾
Projected ERUs and Demand ⁽¹⁾				
Equivalent Residential Units (ERU's)	1,085	1,102	1,121	1,458
Average Day Demand (gpm)	110	112	114	148
Maximum Day Demand (gpm)	176	179	182	237
Flow to replenish Fire Flow storage in 72 hrs. (gpm)	104	104	104	104
<u>Evaluation of Existing Sources</u>				
Available Existing Source (gpm)				
9th Ave Pump Station (750 gpm)	750	750	750	750
Alden Rd Pump Station (775 gpm) ⁽²⁾	775	775	775	775
Total Available Source; 24 hrs (gpm)	1,525	1,525	1,525	1,525
Total Available Source; 20 hrs (gpm)	1,271	1,271	1,271	1,271
Total Available Source; 20 hrs; Largest Source Offline (gpm)	625	625	625	625
Source Surplus/(Deficiency)				
MDD; 20 hour production	1,094	1,092	1,089	1,034
MDD + FSS⁽³⁾; 24 hour production	1,244	1,242	1,239	1,184
ADD; 20 hour production with largest source offline	515	513	511	477
MDD + Fire Flow (388 gpm); 20 hour production; largest source offline⁽⁴⁾	61	58	55	0

¹Projected demands taken from Chapter 3. ERUs calculated as Average Day Demand / ERU water use factor (146 gpd/ERU).

²Alden Road Pump Station is an emergency back-up source and therefore acts as the "largest source offline" category.

³Fire suppression storage requirement is 2,500 gpm for 3 hours, or 450,000 gallons.

⁴Storage in the Herbig Heights zone is insufficient to meet the 20 psi requirement. Therefore, this additional level of service calculation was conducted to determine if the pump station could provide the supplemental water needed to maintain 20 psi while maintaining the MDD level of service.

⁵Maximum ERUs to be served with current sources based on limiting level of service calculation.

Table 7-4. Source Capacity Analysis for the North Aberdeen Zone

	Year			
	2020	2030	2040	Max ⁽⁴⁾
Projected ERUs and Demand ⁽¹⁾				
Equivalent Residential Units (ERU's)	119	121	124	492
Average Day Demand (gpm)	12	12	13	50
Maximum Day Demand (gpm)	19	20	20	80
Flow to replenish Fire Flow storage in 72 hrs. (gpm)	7	7	7	7
<u>Evaluation of Existing Sources</u>				
Available Existing Source (gpm)				
Olympic St Pump Station (875 gpm)	875	875	875	875
Tyler St Pump Station (60 gpm) ⁽²⁾	60	60	60	60
Total Available Source; 24 hrs (gpm)	935	935	935	935
Total Available Source; 20 hrs (gpm)	779	779	779	779
Total Available Source; 20 hrs; Largest Source Offline (gpm)	50	50	50	50
Source Surplus/(Deficiency)				
MDD; 20 hour production	760	50	50	50
MDD + FSS⁽³⁾; 24 hour production	908	908	908	848
ADD; 20 hour production with largest source offline	38	38	37	0

¹Projected demands taken from Chapter 3. ERUs calculated as Average Day Demand / ERU water use factor (146 gpd/ERU).

²Tyler St. Pump Station is an emergency backup source and therefore acts as the main source in the "largest source offline" scenario.

³Fire suppression storage requirement is 500 gpm for 1 hour, or 30,000 gallons.

⁴Maximum ERUs to be served with current sources based on limiting level of service calculation.

Table 7-5. Source Capacity Analysis for the Bench Drive Zone

	Year			
	2020	2030	2040	Max ⁽³⁾
Projected ERUs and Demand ⁽¹⁾				
Equivalent Residential Units (ERU's)	80	89	89	147
Average Day Demand (gpm)	8	9	9	15
Maximum Day Demand (gpm)	18	20	20	24
Peak Hour Demand (gpm) ⁽²⁾	72	77	77	78
<i>Evaluation of Existing Sources</i>				
Available Existing Source (gpm)				
Bench Dr Pump 1 (39 gpm)	39	39	39	39
Bench Dr Pump 2 (39 gpm)	39	39	39	39
Bench Dr Pump 3 (39 gpm)	39	39	39	39
Total Available Source; 24 hrs (gpm)	117	117	117	117
Total Available Source; 20 hrs (gpm)	98	98	98	98
Total Available Source; 20 hrs; Largest Source Offline (gpm)	65	65	65	65
<i>Source Surplus/(Deficiency)</i>				
PHD; 24 hour production; largest source offline	6	2	2	0
MDD; 20 hour production	80	78	78	74
ADD; 20 hour production with largest source offline	57	56	56	50

¹Projected demands taken from Chapter 3. ERUs calculated as Average Day Demand / ERU water use factor (146 gpd/ERU).

²Peak hour demand: (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] +18, where N is the number of ERUs served and C & F values obtained from Table 3-1 of the DOH Water System Design Manual (2019).

³Maximum ERUs to be served with current sources based on limiting level of service calculation.

Table 7-6. Source Capacity Analysis for the Wishkah Zone

	Year			
	2020	2030	2040	Max ⁽⁴⁾
Projected ERUs and Demand ⁽¹⁾				
Equivalent Residential Units (ERU's)	36	36	37	513
Average Day Demand (gpm)	4	4	4	52
Maximum Day Demand (gpm)	6	6	6	83
Flow to replenish Fire Flow storage in 72 hrs. (gpm)	7	7	7	7
<i>Evaluation of Existing Sources</i>				
Available Existing Source (gpd)				
Wishkah Pump Station (100 gpm)	100	100	100	100
Total Available Source; 24 hrs (gpm)	100	100	100	100
Total Available Source; 20 hrs (gpm)	83	83	83	83
Total Available Source; 20 hrs; Largest Source Offline (gpm) ⁽²⁾	N/A	N/A	N/A	N/A
<i>Source Surplus/(Deficiency)</i>				
MDD; 20 hour production	78	77	77	0
MDD + FSS⁽³⁾; 24 hour production	87	87	87	10
ADD; 20 hour production with largest source offline	80	80	80	31

¹Projected demands taken from Chapter 3. ERUs calculated as Average Day Demand / ERU water use factor (146 gpd/ERU).

²Single source zone, therefore no calculation for largest source offline.

³Fire suppression storage requirement is 500 gpm for 1 hour, or 30,000 gallons.

⁴Maximum ERUs to be served with current sources based on limiting level of service calculation.

7.2 Storage Capacity Analysis

7.2.1 Design Criteria

According to DOH requirements, water system storage volume is comprised of five separate components:

- Operating volume
- Equalizing volume
- Fire flow volume
- Standby volume
- Dead volume

These required volume components are illustrated in Figure 7-1. All storage components are described in more detail below.

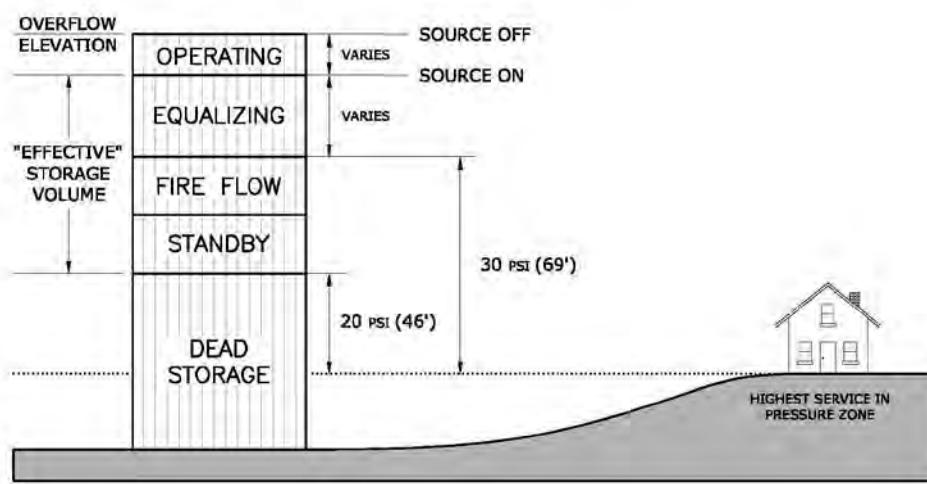


Figure 7-1. Storage Components

Operating and Dead Storage Volumes

Operating volume is the water that lies between low and high water storage elevations set by City operations staff to control system pumps and flow control valves. Dead volume is the volume at the bottom of the tank that cannot be used because it is physically too low to provide sufficient pressures. Operational and dead volumes are subtracted from total storage to determine the effective storage available for equalizing, standby, and fire flow.

Equalizing Volume

Equalizing volume is the total volume needed to moderate daily fluctuations in diurnal demands during periods when the demand exceeds the capacity of the supply system. Equalizing volume requirements are greatest on the day of peak demand. Operation of a properly balanced system results in replenishment of storage facilities during times of day when the demand curve is below the capacity of the supply system, and depletion of storage facilities when the demand exceeds the supply capacity. The equalizing volume of a storage tank must be located at an elevation that provides a minimum pressure of 30 pounds per square inch (psi) to all customers served by the tank.

Fire Flow Volume

The required fire flow volume for a given pressure zone is calculated as the required fire flow multiplied by the required duration, as established by the local fire authority. Required fire flows and durations vary across the City's service area, as it includes multiple zoning designations. The maximum fire flow volume considered in this analysis is 3,000 gpm for 3 hours, within the Low Level pressure zone, based on information provided by the City Fire Department (see Appendix J).

The fire flow volume of a storage tank must be located at an elevation that provides a minimum pressure of 20 psi to all customers served by the tank. DOH allows for the "nesting" of standby

and fire flow storage, with the larger used for the storage volume. For the purpose of this plan, the standby and fire flow storage volumes are nested, as the City Fire Department has approved of this practice.

Standby Volume

Standby volume is required to supply reasonable system demands during a foreseeable system emergency or outage. A key concept is that establishing standby volume involves planning for reasonable system outages – those that can be expected to occur under normal operating conditions, such as a pipeline failure, power outage or valve failure. Major system emergencies, such as those created by an earthquake, are intended to be covered by emergency system operations planning, since construction of sufficient reserve volume to accommodate sustained system demands under emergency conditions is not economically feasible.

DOH has established guidelines for determining minimum required standby volume. This component is calculated as the greater of: two times the average day demand, less multi-source credit; or 200 gallons times the number of ERUs served by the storage facility. The multi-source credit is applicable only for pressure zones that have multiple sources of supply, and allows the required standby storage volume in such instances to be reduced. The credit assumes the largest source of supply is out of service; thus, it is calculated as the total source available to a particular pressure zone, or zone combination, less the capacity of the largest source. No credit is allowed for zones having only one source of supply.

7.2.2 Storage Capacity Evaluation

Low Level Zone

The Fairview Reservoirs and South Aberdeen Tank provide storage to this zone. As indicated in Table 7-7, the largest storage volume requirement for this zone is for standby storage (which includes standby storage associated with the boosted pressure zones). A multi-source credit was applied to this zone by considering each of the eight membrane filtration pathways as a unique source.

Based upon the results of the calculation, there is a surplus of storage for the overall system to meet projected demands. If problems occur where water cannot be distributed throughout the system quickly enough during an emergency event, the City can draw water through the Hoquiam/Aberdeen intertie.

Herbig Heights Zone

The two Herbig Heights tanks have a combined storage volume of approximately 521,000 gallons and serve approximately 542 residential and commercial customers. Table 7-8 provides the storage capacity analysis for the Herbig Heights Zone.

The base analysis shows a storage deficiency in the 20 psi category of approximately 70,000 gallons. In this zone, fire flow and standby storage are nested, meaning the larger of the two determines the need for storage at 20 psi. To account for this deficiency, the fire flow storage

requirement is partially met by the capacity of the 9th Ave pump station. The City has a portable generator to operate the pump station during emergency situations when there is a loss of power. DOH allows a reduction in fire flow storage if there is backup power and a redundant source available. This reduction is applied to the zone consistent with the source adequacy analysis described in Table 7-3.

North Aberdeen Zone

The storage volume of the North Aberdeen Tank is approximately 100,000 gallons and it serves 84 residential customers in the North Aberdeen Zone. There is no deficiency determined from the storage capacity analysis shown in Table 7-9. There is a surplus of storage available through the 20-year planning period. Fire flow and standby storage are nested in this zone.

Upper Wishkah Zone

The Wishkah Tank is approximately 50,000 gallons and serves 20 residential customers near the water treatment plant. There is no deficiency determined from the storage capacity analysis shown in Table 7-10. There is a surplus of storage available through the 20-year planning period. Fire flow and standby storage are nested in this zone.

Table 7-7. Storage Capacity Analysis for Low Level Zone

	Year			
	2020	2030	2040	Max ⁽¹¹⁾
Projected ERUs and Demand ⁽¹⁾				
Equivalent Residential Units (ERU's)	20,382	20,621	20,876	83,510
Average Day Demand (gpd)	2,981,927	3,016,785	3,054,198	12,217,501
Maximum Day Demand (gpd)	4,771,084	4,826,856	4,886,717	19,548,002
Peak Hour Demand (gpm) ⁽²⁾	5,356	5,418	5,484	21,775
Available Source (gpd) ⁽³⁾				
Water Treatment Plant	5,416,667	5,416,667	5,416,667	5,416,667
Total Available Source (gpd)	5,416,667	5,416,667	5,416,667	5,416,667
Total Available Source; Largest Source Offline (gpd)	4,739,583	4,739,583	4,739,583	4,739,583
Required Storage Calculations				
Operational Storage (gal) ⁽⁴⁾	1,242,477	1,242,477	1,242,477	1,242,477
Equalizing Storage (gal) ⁽⁵⁾	239,131	248,426	258,403	2,701,950
Standby Storage (gal) ⁽⁶⁾	4,076,456	4,124,108	4,175,253	19,695,419
Fire Flow Storage (gal) ⁽⁷⁾	540,000	540,000	540,000	540,000
Required Storage				
Greater than 30 psi at highest meter (gal) ⁽⁸⁾	1,481,608	1,490,903	1,500,880	3,944,427
Greater than 20 psi at highest meter (gal) ⁽⁹⁾	5,558,063	5,615,011	5,676,133	23,639,846
Existing Storage Greater Than 30 psi (gal) ⁽¹⁰⁾				
Fairview 1	5,012,715	5,012,715	5,012,715	5,012,715
Fairview 2	8,178,640	8,178,640	8,178,640	8,178,640
S Aberdeen	30,521	30,521	30,521	30,521
Total Existing Storage at 30 psi (gal)	13,221,875	13,221,875	13,221,875	13,221,875
Storage Surplus/(Deficiency) at 30 psi (gal)	11,740,267	11,730,972	11,720,995	9,277,448
Existing Storage Greater Than 20 psi (gal) ⁽¹⁰⁾				
Fairview 1	8,636,364	8,636,364	8,636,364	8,636,364
Fairview 2	14,090,909	14,090,909	14,090,909	14,090,909
S Aberdeen	912,573	912,573	912,573	912,573
Total Existing Storage at 20 psi (gal)	23,639,846	23,639,846	23,639,846	23,639,846
Storage Surplus/(Deficiency) at 20 psi (gal)	18,081,783	18,024,835	17,963,713	0

¹Projected demands taken from Chapter 3. ERUs calculated as Average Day Demand / ERU water use factor (146 gpd/ERU).

²Peak hour demand: (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] + 18, where N is the number of ERUs served and C & F values obtained from Table 3-1 of the DOH Water System Design Manual (2019).

³Source pumps operating at the DOH suggested production rate of 20 hours per day.

⁴Required operation storage is based on lead and lag pump on/off programmed elevations.

⁵Required equalizing storage is equal to [(PHD – Total Available Source) x 150 minutes].

⁶Required standby storage is the greater of (2 * ADD less multi-source credit) or (200 gal/ERU * number of ERUs)

⁷Required fire flow storage: 3,000 gallons x 3 hours = 540,000 gallons.

⁸Total requires storage greater than 30 psi is equal to the total of operational and equalizing storage.

⁹Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of either standby or fire suppression storage.

¹⁰The storage volume available in existing reservoirs at 30 and 20 psi is based on the elevation of the highest customer (160 ft).

¹¹Maximum ERUs servable by available storage located solely in the Main Aberdeen Zone.

Table 7-8. Storage Capacity Analysis for Herbig Heights Zone

	Year			
	2020	2030	2040	Max ⁽¹¹⁾
Projected ERUs and Demand ⁽¹⁾				
Equivalent Residential Units (ERU's)	1,085	1,102	1,121	1,901
Average Day Demand (gpd)	158,800	161,284	163,949	278,106
Maximum Day Demand (gpd)	254,080	258,054	262,318	444,970
Peak Hour Demand (gpm) ⁽²⁾	356	361	366	549
Available Source (gpd) ⁽³⁾				
9th Ave Pump Station (750 gpm)	900,000	900,000	900,000	900,000
Alden Rd Pump Station (775 gpm)	930,000	930,000	930,000	930,000
Total Available Source (gpd)	1,830,000	1,830,000	1,830,000	1,830,000
Total Available Source; Largest Source Offline (gpd)	930,000	930,000	930,000	930,000
Required Storage Calculations				
Operational Storage (gal) ⁽⁴⁾	54,312	54,312	54,312	54,312
Equalizing Storage (gal) ⁽⁵⁾	0	0	0	0
Standby Storage (gal) ⁽⁶⁾	217,088	220,483	224,127	380,186
Fire Flow Storage (gal) ⁽⁷⁾	380,160	380,160	380,160	380,160
Required Storage				
Greater than 30 psi at highest meter (gal) ⁽⁸⁾	54,312	54,312	54,312	54,312
Greater than 20 psi at highest meter (gal) ⁽⁹⁾	434,472	434,472	434,472	434,499
Existing Storage Greater Than 30 psi (gal) ⁽¹⁰⁾				
Herbig Heights 1	217,249	217,249	217,249	217,249
Herbig Heights 2	217,249	217,249	217,249	217,249
Total Existing Storage at 30 psi (gal)	434,499	434,499	434,499	434,499
Storage Surplus/(Deficiency) at 30 psi (gal)	380,186	380,186	380,186	380,186
Existing Storage Greater Than 20 psi (gal) ⁽¹⁰⁾				
Herbig Heights 1	217,249	217,249	217,249	217,249
Herbig Heights 2	217,249	217,249	217,249	217,249
Total Existing Storage at 20 psi (gal)	434,499	434,499	434,499	434,499
Storage Surplus/(Deficiency) at 20 psi (gal)	26	26	26	0

¹Projected demands taken from Chapter 3. ERUs calculated as Average Day Demand / ERU water use factor (146 gpd/ERU)

²Peak hour demand: (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] +18, where N is the number of ERUs served and C & F values obtained from Table 3-1 of the DOH Water System Design Manual (2019).³Source pumps operating at the DOH suggested production rate of 20 hours per day.

⁴Required operation storage is based on lead and lag pump on/off programmed elevations.

⁵Required equalizing storage is equal to [(PHD – Total Available Source) x 150 minutes].

⁶Required standby storage is the greater of (2 * ADD less multi-source credit) or (200 gal/ERU * number of ERUs)

⁷The zone requirements for fire flow is 2,500 gpm for 3 hours. The 9th Avenue Pump Station accounts for 388 gpm of this requirement. Therefore, the remaining required storage is 2,112 gpm for 3 hours, or 380,160 gallons of storage.

⁸Total requires storage greater than 30 psi is equal to the total of operational and equalizing storage.

⁹Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of either standby or fire suppression storage.

¹⁰The storage volume available in existing reservoirs at 30 and 20 psi is based on the elevation of the highest customer (345 ft).

¹¹Maximum ERUs servable by available storage located solely in the Herbig Heights Zone.

Table 7-9. Storage Capacity Analysis for North Aberdeen Zone

	Year			
	2020	2030	2040	Max ⁽¹¹⁾
Projected ERUs and Demand ⁽¹⁾				
Equivalent Residential Units (ERU's)	119	121	124	322
Average Day Demand (gpd)	17,435	17,770	18,131	47,168
Maximum Day Demand (gpd)	27,895	28,433	29,009	75,469
Peak Hour Demand (gpm) ⁽²⁾	69	70	70	133
Available Source (gpd) ⁽³⁾				
Olympic St Pump Station (875 gpm)	1,050,000	1,050,000	1,050,000	1,050,000
Tyler St Pump Station (60 gpm)	72,000	72,000	72,000	72,000
Total Available Source (gpd)	1,122,000	1,122,000	1,122,000	1,122,000
Total Available Source; Largest Source Offline (gpd)	72,000	72,000	72,000	72,000
Required Storage Calculations				
Operational Storage (gal) ⁽⁴⁾	36,847	36,847	36,847	36,847
Equalizing Storage (gal) ⁽⁵⁾	0	0	0	0
Standby Storage (gal) ⁽⁶⁾	23,834	24,293	24,786	64,482
Fire Flow Storage (gal) ⁽⁷⁾	30,000	30,000	30,000	30,000
Required Storage				
Greater than 30 psi at highest meter (gal) ⁽⁸⁾	36,847	36,847	36,847	36,847
Greater than 20 psi at highest meter (gal) ⁽⁹⁾	66,847	66,847	66,847	101,328
Existing Storage Greater Than 30 psi (gal) ⁽¹⁰⁾				
N Aberdeen	101,328	101,328	101,328	101,328
Total Existing Storage at 30 psi (gal)	101,328	101,328	101,328	101,328
Storage Surplus/(Deficiency) at 30 psi (gal)	64,482	64,482	64,482	64,482
Existing Storage Greater Than 20 psi (gal) ⁽¹⁰⁾				
N Aberdeen	101,328	101,328	101,328	101,328
Total Existing Storage at 20 psi (gal)	101,328	101,328	101,328	101,328
Storage Surplus/(Deficiency) at 20 psi (gal)	34,482	34,482	34,482	0

¹Projected demands taken from Chapter 3. ERUs calculated as Average Day Demand / ERU water use factor (146 gpd/ERU)

²Peak hour demand: (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] +18, where N is the number of ERUs served and C & F values obtained from Table 3-1 of the DOH Water System Design Manual (2019).

³Source pumps operating at the DOH suggested production rate of 20 hours per day.

⁴Required operation storage is based on lead and lag pump on/off programmed elevations.

⁵Required equalizing storage is equal to [(PHD – Total Available Source) x 150 minutes].

⁶Required standby storage is the greater of (2 * ADD less multi-source credit) or (200 gal/ERU * number of ERUs)

⁷Required fire flow storage: 500 gallons x 1 hour = 30,000 gallons

⁸Total requires storage greater than 30 psi is equal to the total of operational and equalizing storage.

⁹Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of either standby or fire suppression storage.

¹⁰The storage volume available in existing reservoirs at 30 and 20 psi is based on the elevation of the highest customer (265 ft).

¹¹Maximum ERUs servable by available storage located solely in the North Aberdeen Zone.

Table 7-10. Storage Capacity Analysis for Wishkah Zone

	Year			
	2020	2030	2040	Max ⁽¹¹⁾
Projected ERUs and Demand ⁽¹⁾				
Equivalent Residential Units (ERU's)	36	36	37	170
Average Day Demand (gpd)	5,207	5,308	5,415	24,929
Maximum Day Demand (gpd)	8,332	8,492	8,664	39,887
Peak Hour Demand (gpm) ⁽²⁾	35	36	36	86
Available Source (gpd) ⁽³⁾				
Wishkah Pump Station (100 Gpm)	120,000	120,000	120,000	120,000
Total Available Source (gpd)	120,000	120,000	120,000	120,000
Total Available Source; Largest Source Offline (gpd)	0	0	0	0
Required Storage Calculations				
Operational Storage (gal) ⁽⁴⁾	11,702	11,702	11,702	11,702
Equalizing Storage (gal) ⁽⁵⁾	0	0	0	339
Standby Storage (gal) ⁽⁶⁾	10,415	10,615	10,831	34,080
Fire Flow Storage (gal) ⁽⁷⁾	30,000	30,000	30,000	30,000
Required Storage				
Greater than 30 psi at highest meter (gal) ⁽⁸⁾	11,702	11,702	11,702	12,041
Greater than 20 psi at highest meter (gal) ⁽⁹⁾	41,702	41,702	41,702	46,121
Existing Storage Greater Than 30 psi (gal) ⁽¹⁰⁾				
Wishkah Tank	46,121	46,121	46,121	46,121
Total Existing Storage at 30 psi (gal)	46,121	46,121	46,121	46,121
Storage Surplus/(Deficiency) at 30 psi (gal)	34,418	34,418	34,418	34,080
Existing Storage Greater Than 20 psi (gal) ⁽¹⁰⁾				
Wishkah Tank	46,121	46,121	46,121	46,121
Total Existing Storage at 20 psi (gal)	46,121	46,121	46,121	46,121
Storage Surplus/(Deficiency) at 20 psi (gal)	4,418	4,418	4,418	0

¹Projected demands taken from Chapter 3. ERUs calculated as Average Day Demand / ERU water use factor (146 gpd/ERU)

²Peak hour demand: (Maximum Day Demand per ERU / 1440) * [(C) * (N) + F] +18, where N is the number of ERUs served and C & F values obtained from Table 3-1 of the DOH Water System Design Manual (2019).

³Source pumps operating at the DOH suggested production rate of 20 hours per day.

⁴Required operation storage is based on lead and lag pump on/off programmed elevations.

⁵Required equalizing storage is equal to [(PHD – Total Available Source) x 150 minutes].

⁶Required standby storage is the greater of (2 * ADD less multi-source credit) or (200 gal/ERU * number of ERUs)

⁷Required fire flow storage: 500 gallons x 1 hour = 30,000 gallons

⁸Total requires storage greater than 30 psi is equal to the total of operational and equalizing storage.

⁹Total required storage greater than 20 psi is equal to the total of operational, equalizing, and the greater of either standby or fire suppression storage.

¹⁰The storage volume available in existing reservoirs at 30 and 20 psi is based on the elevation of the highest customer. This analysis assumes all storage available in the Wishkah reservoir is at least 30 psi.

¹¹Maximum ERUs servable by available storage located solely in the Wishkah Zone.

7.3 Distribution System Analysis

7.3.1 Analysis Methodology

As required by DOH, the City's water distribution system was analyzed for the following two conditions: peak hour demands (PHD), and maximum day demands (MDD) plus fire flow. All hydraulic calculations were performed within the City's water distribution model, which was developed using WaterCAD v8i software produced by Bentley.

7.3.2 System Components

The WaterCAD software allows all pipes and junction nodes in the City's distribution system to be entered into one complete model, which consists of approximately 800 pipes and 600 junction nodes, along with reservoirs and pump stations.

As part of this WSP update, the City's existing model was updated to include recent changes to the system. Pipe and node locations were adjusted according to the City's current piping GIS file. Elevations in the model were adjusted with County topographic data.

The transmission system and Upper Wishkah Zone were not included in the modeling analysis. The City's model includes the complete distribution system downstream of the Fairview Reservoirs.

7.3.3 Water Demand Allocation

For the hydraulic model, the demand forecast presented in Chapter 3 was used to define the total demand for customers within the City's service area. Spatial distribution of demand within the system was determined based on using geolocated 2019 meter demands. The 2019 demands were then scaled to match the forecasted demand for each pressure zone and total system demand as presented in Chapter 3.

As such, demands were allocated across every node in the model with the exclusion of some nodes that were located near a storage reservoir or pump station where there is no known connection. A thorough review of the system was conducted, to see if demands were assigned to nodes in a reasonable manner.

Demands were developed for average day, maximum day, and peak hour conditions. Model demands include non-revenue water.

7.3.4 Calibration

A critical step in the development of a hydraulic model, prior to using it as a tool to analyze system performance, is calibration. Calibration consists of measuring pressure and flows in the field and comparing them with the same pressures and flows simulated in the model. As part of the 2012 Water System Plan, a steady-state calibration effort was completed based on a total of seventeen hydrant tests that were conducted by City staff between late March and early April 2012. The test locations were selected to provide adequate coverage for each pressure zone and to maximize the friction losses across the system by placing the test locations as far from sources of water for each pressure zone as possible.

For the hydrant test, a pressure gage was placed on the “residual” hydrant and pressure was measured under normal operating (where no hydrant was flowing) or “static” conditions. Once the pressure was recorded, a second hydrant was opened and the flow at this hydrant was measured using a pitot gage. While the second hydrant was open, the pressure was observed and recorded (once the gage readings stabilized) at the residual hydrant.

To conduct calibration, the system operations and boundary conditions are recorded during the time the hydrant tests are conducted. Boundary conditions of concern typically include system demands, reservoir levels, and pump station flows. Demands were allocated as described above, with total demand adjusted to match the calculated average demand for the day for the system.

Adjustments of pipe friction factors (based on pipe age and material) were made within the system to achieve steady state calibration. Table 7-11 contains the field data collected for the hydrant tests and the results of the model simulations.

In Test No 6, the residual hydrant was leaking and an accurate residual pressure could not be obtained. During Test No 7, the residual pressure in the field was considerably lower than that predicted in the model. It was discovered that field mapping indicated a 6-inch line was present that was thought to be 10-inch. Field crews investigated the area for closed valves that might restrict flow but no reasonable explanation was found. In Test No 10, the field drop in pressure was much greater than predicted by the model. The test was revised to another hydrant on a neighboring street, and the results between the field and the model were consistent. In Test No 12, the measured drop in pressure was much larger than predicted by the model. The location of the test is on a dead end 6-inch main and no reasonable explanation is found for the difference between the measured data and the model output. These tests were deemed as outliers and not used to calibrate the City’s hydraulic model.

14 of the 17 tests yield consistent results with minor adjustments to friction factors in the model. Only Test No 4 had a difference between the field and modeled pressure drop greater than 5 psi at 5.1 psi. For the purposes of comprehensive planning, the City’s model is considered to be well calibrated for steady state conditions.

As there have been few changes to the water system since 2012, no additional calibration was completed as part of the 2020 Water System Plan.

Table 7-11. Calibration Results

Hydrant Test No.	Gage Node ID	Pressure Zone	Gage Node Elev (ft)	Fire flow (gpm)	FIELD Static Pressure (psi)	MODEL Static Pressure (psi)	Static Pressure Difference (psi) ¹	FIELD Residual Pressure (psi)	MODEL Residual Pressure (psi)	Residual Pressure Difference (psi)	Field Pressure Drop (psi) ²	Model Pressure Drop (psi) ³	Difference in Field and Model Pressure Drops (psi) ⁴
1	J-7	Herbig Heights	329.05	1000	45	45.1	-0.1	30	32.6	-2.6	15	12.5	2.5
2	J-90	Herbig Heights	317.94	1100	50	51.1	-1.1	40	42	-2	10	9.1	0.9
		Second Hydrant		1000									
3	J-89	Herbig Heights	318	880	52	54.8	-2.8	34	39.4	-5.4	18	15.4	2.6
4	J-993	Main - North	49.56	880	78	79.3	-1.3	44	50.4	-6.4	34	28.9	5.1
5	Hydrant #3	Low Level	10.74	1130	94	96.8	-2.8	66	65.4	0.6	28	31.4	-3.4
6	J-2220	Low Level	14.47	530	90	95.5	-5.5	36	80	-44	54	15.5	38.5
7	J-364	Low Level	12.99	400	93	95.6	-2.6	32	77.2	-45.2	61	18.4	42.6
		Second Hydrant		400									
8	J-1222	Low Level	65.91	600	62	73.6	-11.6	37	49.3	-12.3	25	24.3	0.7
9	J-272	Low Level	86.61	800	62	64.8	-2.8	52	54	-2	10	10.8	-0.8
10	J-995	Low Level	2.24	700	92	97	-5	20	49.7	-29.7	72	47.3	24.7
10a	J-468	Low Level	25	530	95	89.7	5.3	70	63.1	6.9	25	26.6	-1.6
		North Aberdeen											
11	J-566	North Aberdeen	215.31	1525	100	99	1	65	64.7	0.3	35	34.3	0.7
12	J-494	Low Level	14.19	590	90	92.3	-2.3	38	69.1	-31.1	52	23.2	28.8
13	J-952	Low Level	157.14	800	32	35.2	-3.2	8	6.5	1.5	24	28.7	-4.7
14	C-999	Low Level	10	1300	92	95.2	-3.2	77	81.8	-4.8	15	13.4	1.6
15	J-814	Low Level	78.55	880	70	63.4	6.6	55	47.1	7.9	15	16.3	-1.3
16	J-135	Low Level	10.72	1250	90	93.5	-3.5	66	66.2	-0.2	24	27.3	-3.3
		Second Hydrant		800									
17	J-916	Low Level	10	1325	86	94.2	-8.2	70	73.9	-3.9	16	20.3	-4.3
		Second Hydrant		1350									

Notes:

- (1) Calculated: Model Static Pressure (psi) minus Field Static Pressure (psi)
- (2) Calculated: Field Residual Pressure (psi) minus Field Static Pressure (psi)
- (3) Calculated: Model Residual Pressure (psi) minus Model Static Pressure (psi)
- (4) Calculated: Model Pressure Drop (psi) minus Field Pressure Drop (psi)

7.3.5 Modeling Scenarios

The model was used to assess distribution system capacity to meet the required level of service for static pressures and fire flows.

In accordance with WAC 246-290-230, a minimum pressure of 30 psi must be maintained at all customer connections under peak hour demand (PHD) conditions with equalizing storage depleted in the reservoirs. A minimum of 20 psi must be maintained for fire flows under MDD conditions with equalizing and fire flow storage depleted. If these criteria could not be met, improvements were identified and through an iterative trial-and-error process, implemented until pressure criteria could be satisfied with a minimum of pipe and facility additions.

Steady state hydraulic analyses were completed for each pressure zone for existing (2020), 10-year (2030), and 20-year (2040) demand conditions. These considered peak hour demand and fire flow demand (MDD plus fire flow) conditions. Table 7-12 describes the modeling scenarios conducted, and the sequence within which they were performed. The results of the peak hour and fire flow analyses are described in greater detail below.

Table 7-12. Modeling Scenarios

Description	Demand	Purpose
Existing Year Peak Hour	2020 Peak Hour Demand	Evaluate system
Existing Year Fire Flow	2020 Maximum Day Demand plus fire flow	Evaluate system
Plan Year 10 Peak Hour	Plan Year 10 Peak Hour Demand	Evaluate system performance and develop CIP for peak hour conditions
Plan Year 10 Fire Flow	Plan Year 10 Maximum Day Demand plus fire flow	Evaluate system performance and develop CIP for Plan Year 10 fire flow conditions
Plan Year 20 Peak Hour	Plan Year 20 Peak Hour Demand	Evaluate system and develop CIP for Plan Year 20 peak hour conditions
Plan Year 20 Fire Flow	Plan Year 20 Maximum Day Demand plus fire flow	Evaluate system performance and develop CIP for Plan Year 20 fire flow conditions

7.3.6 Peak Hour Analysis Results

Figure 7-2 and Figure 7-3 present the PHD pressure results for 2020 and 2040, respectively. Table 7-12 provides a summary of the pressure distribution amongst the model nodes, organized by pressure zone. These results are used to identify areas of low pressure (<30 psi) and areas of high pressure (>100 psi).

The majority of the City's water distribution system (approximately 76% of system nodes) experiences pressures greater than 80 psi. 70 percent of the system has peak hour pressures between 80 to 100 psi, while 6 percent of the system is above 100 psi. There is a large area of high pressure in the southern portion of the Herbig Heights Zone along 7th Ave. Also, there are high pressures above 100 psi in the North Aberdeen Zone. In cases where a customer is concerned about high pressure and potentially adverse effects on in-premise plumbing, it is the customer's responsibility to install and maintain their own individual pressuring reducing valve on their side of the meter. Typically City customers implement this approach only when pressures are frequently in excess of 100 psi.

There are three areas of low pressure in the system. For a few services along Valley View Way in the vicinity of the Bench Drive pump station, pressures are regularly near or below 30 psi based on the elevation in the area. Project D-18 will extend a 2" new waterline from the Bench Drive zone along Valleyview Way to connect to these services to the elevated pressure zone.

A few services on Ranier Street in the Low Level Zone may experience system pressures less than 30 psi during peak hour conditions. This is based on the elevation of the area. Project D-14 will install a PRV from the North Aberdeen Zone along Ranier Street to reduce the impacts of drawdown during peak demands.

Another area of low pressure is at Arnold Street and 2nd Avenue. The model predicts that during peak hour conditions, the system pressure can drop below 30 psi at this location. No improvement is proposed to address the low pressure at this location as it is an existing condition that would be too costly to address.

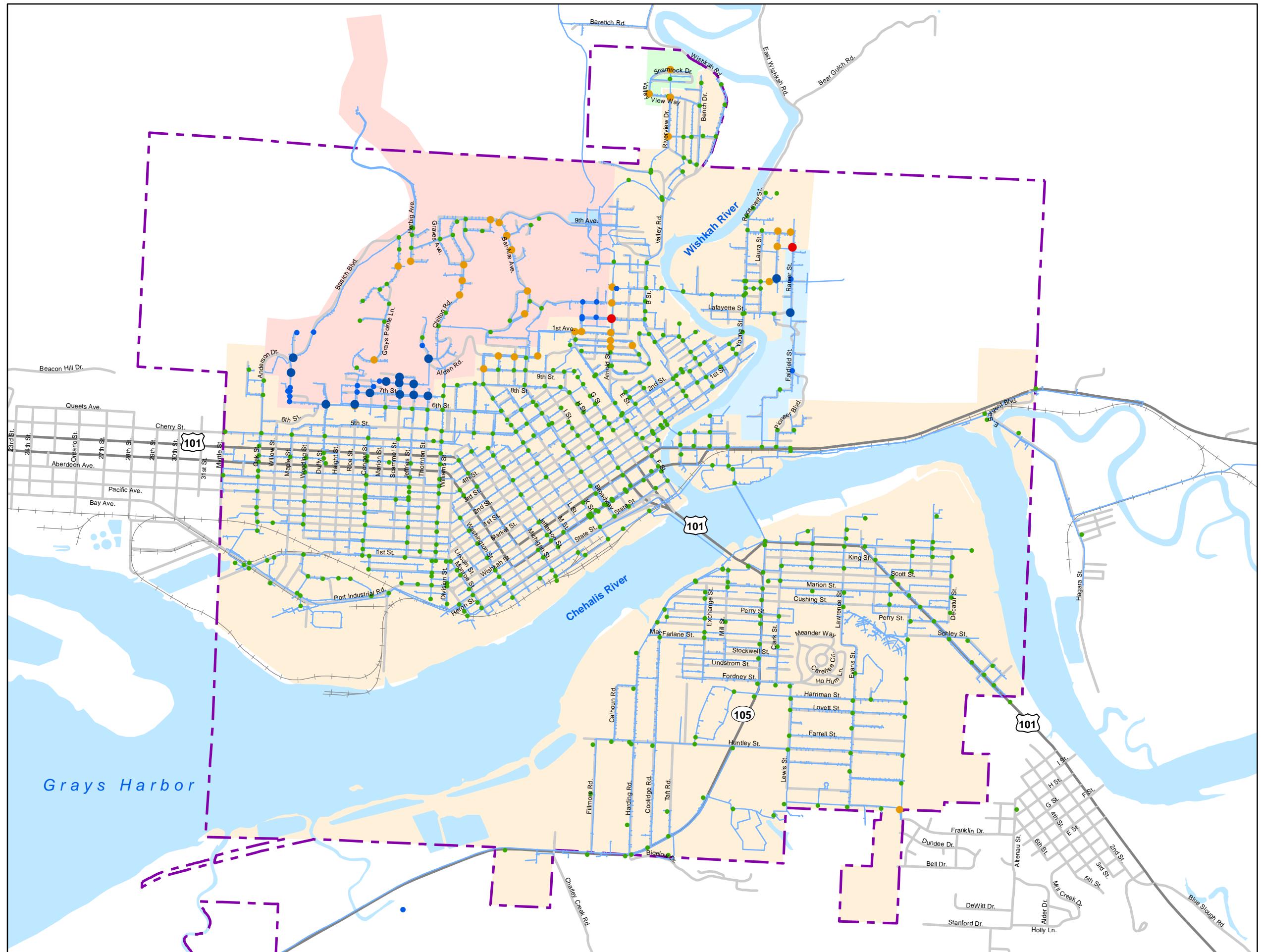
The model's peak hour pressure results for the existing and future scenarios are shown in Table 7-13. With the exception of the Valley View Way area where the Bench Drive Zone will be extended to include more services, system pressures remain consistent as seen in the current system.

Table 7-13. Peak Hour Demand Pressure Results

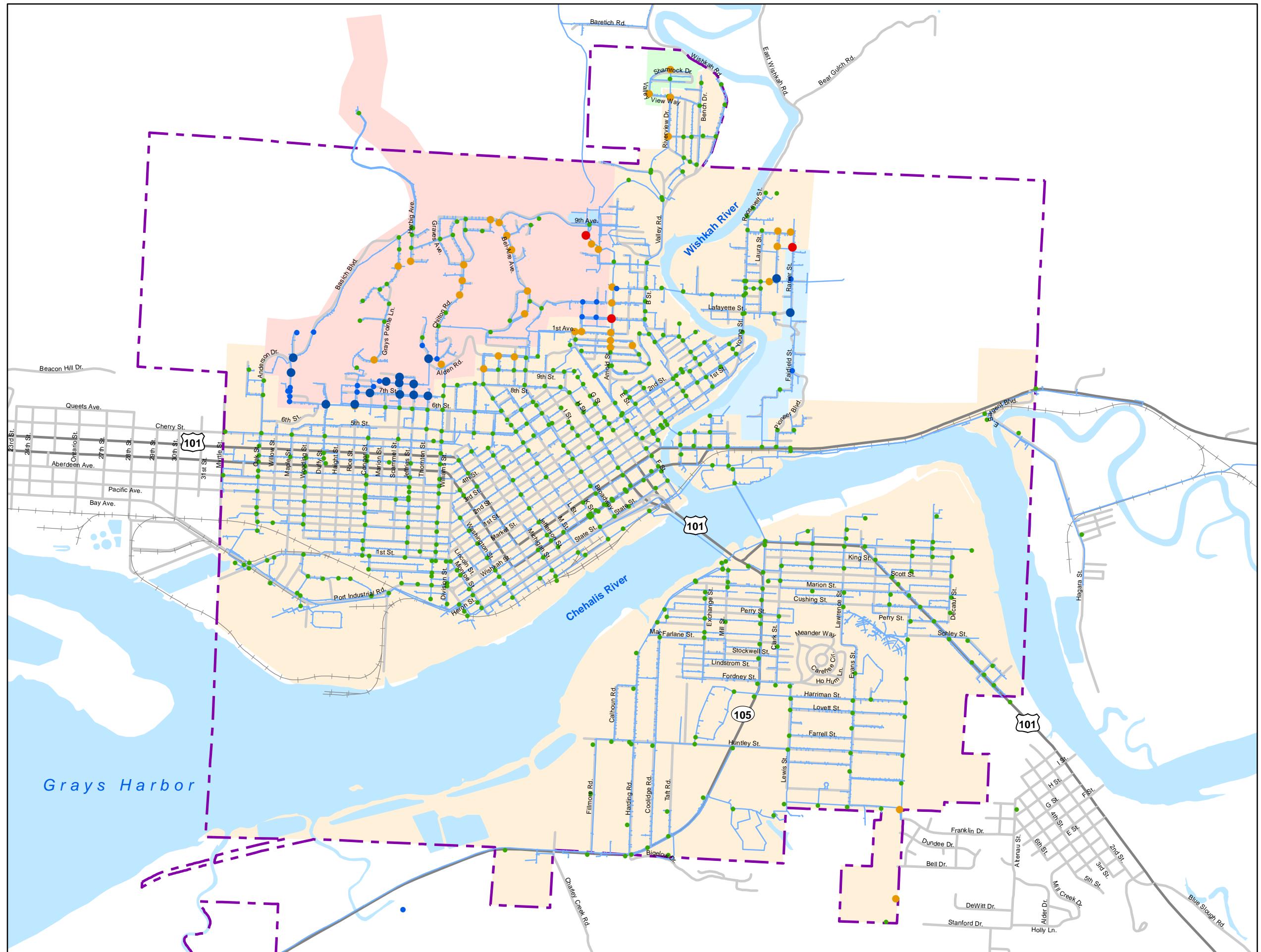
2020 Node Pressure by Pressure Zones ⁽¹⁾				
Pressure Zone	<30 psi	30-80 psi	80-100 psi	>100 psi
Low Level	2	98	413	3
Herbig Heights	0	36	4	29
North Aberdeen	0	0	1	4
Bench Drive	0	4	0	0
Total	2	138	418	36
2040 Node Pressure by Pressure Zones ⁽¹⁾				
Pressure Zone	<30 psi	30-80 psi	80-100 psi	>100 psi
Low Level	3	84	427	2
Herbig Heights	0	36	4	29
North Aberdeen	0	0	1	4
Bench Drive	0	4	0	0
Total	3	124	432	35

Notes:

1. The values in each cell represent the number of nodes within a certain pressure range for a given pressure zone.



HDR



10

Figure 7-3
2040 Peak Hour Pressure Map

CITY OF ABERDEEN
WATER SYSTEM PLAN

March 2021

7.3.7 Fire Flow Analysis Results

Fire flow analysis results are provided in Figure 7-4 and Figure 7-5 for 2020 and 2040, respectively. These figures depict the locations where available fire flows are less than the established fire flow goals. Detailed results for select, key locations are summarized in Table 7-14.

Improved fire flow conditions in the future at the select locations are a result of identified capital improvement projects, which are summarized below and described in detail in Chapter 8. These projects are comprised primarily of the replacement of small diameter piping.

While fire flow related improvements have been identified, many of them are not scheduled for implementation until beyond the 10-year planning horizon. This is because the differences between available and desired fire flows have existed for many years, would be costly to fix through infrastructure improvements, and the City Fire Department is aware of them. In the near-term, the City is directing its available resources at addressing source of supply concerns (as noted previously in this chapter). Thus, most of the fire flow related projects will be addressed further in the future as resources are available.

- At location A, the fire flow goal of 3,000 gpm is limited in the area on the western end of the distribution system along Highway 101. Flow is limited in the 6-inch and 8-inch water mains due to a lack of connection and looping in the area. There is no recommended improvement as the use of multiple hydrants can satisfy the goal.
- At location B, the fire flow goal of 3,000 gpm is limited on a dead end 8-inch water main. No improvement is identified as the hydrant meets 92% of the goal.
- At location C, the fire flow goal of 3,000 gpm in the vicinity of Division St and Port Industrial Road is limited in three hydrants on dead end 6-inch and 8-inch water mains. No improvement is identified as multiple hydrants are available to satisfy the fire flow goal.
- At location D, the fire flow goal of 3,000 gpm is limited in one hydrant on a dead end 6-inch water main. No improvement is identified as multiple hydrants are available to satisfy the fire flow goal.
- At location E, the fire flow goal of 3,000 gpm is limited in one hydrant by the capacity of the 6-inch water main. No improvement is identified as multiple hydrants are available to satisfy the fire flow goal.
- At location F, the fire flow goal of 3,000 gpm is limited by the capacity of the 4-inch and 6-inch water main. No improvement is identified as multiple hydrants are available to satisfy the fire flow goal.
- At location G, the fire flow goal of 3,000 gpm is limited in one hydrant by the capacity of the 6-inch water main. No improvement is identified as multiple hydrants are available to satisfy the fire flow goal.
- At location H, the fire flow goal of 500 gpm is limited by high elevations along Valley View Way and the capacity of the Bench Drive pump station. No improvement is identified as the Fire Department currently marks these hydrants as having limited

available fire flow. In lieu of distribution improvements, the fire flow can be supplied through pumper trucks filling from other hydrants.

- At location I, the fire flow goal of 500 gpm is limited in the dead end portion of the system and high elevations along Ranier Street. Project D-14 installs a PRV from the North Aberdeen zone on Ranier Street. This will increase fire flow in the area to satisfy the goal.
- At location J, the fire flow goal of 3,000 gpm is limited in the hydrants along Highway 12 east of Chehalis Street. The area is served by a dead end 6-inch water main that limits the available flow. Project D-16 installs a 12-inch water main parallel to the existing 6-inch water main on Highway 12. This will increase the available fire flow to satisfy the goal.
- At location K, the fire flow goal of 3,000 gpm is limited in the hydrants along Junction City Road and Hagara Street. The dead end 12-inch water main that serves the area is limited by the same 6-inch water main described above on Highway 12. Project D-15 would install a new river crossing between Curtis Street and Hagara Street, improving the available fire flow and providing redundancy. Project D-16 installs a new 12-inch water main to remove the hydraulic bottle neck along Highway 12. Both projects will improve the available fire flow to meet the goal.
- At location L, the fire flow goal of 3,000 gpm is limited in hydrants on dead end water mains along Curtis Street. No improvement is identified as multiple hydrants are available to satisfy the fire flow goal.
- At location M, the fire flow goal of 3,000 gpm is not available in hydrants along Highway 101 south of Schley Street. The available fire flow is limited by the capacity of the 6-inch and 8-inch water mains. There is no project identified as multiple hydrants are available to satisfy the goal.
- At location N, the fire flow goal of 3,000 gpm is not available in one hydrant on Harding Road. The available fire flow is limited by the capacity of the 6-inch water main. No improvement is identified as multiple hydrants are available to satisfy the goal.

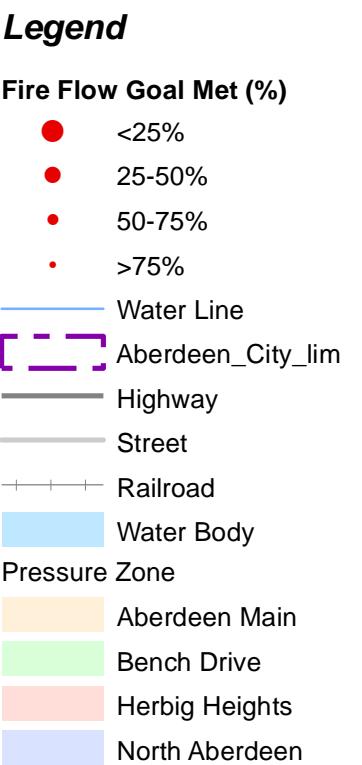
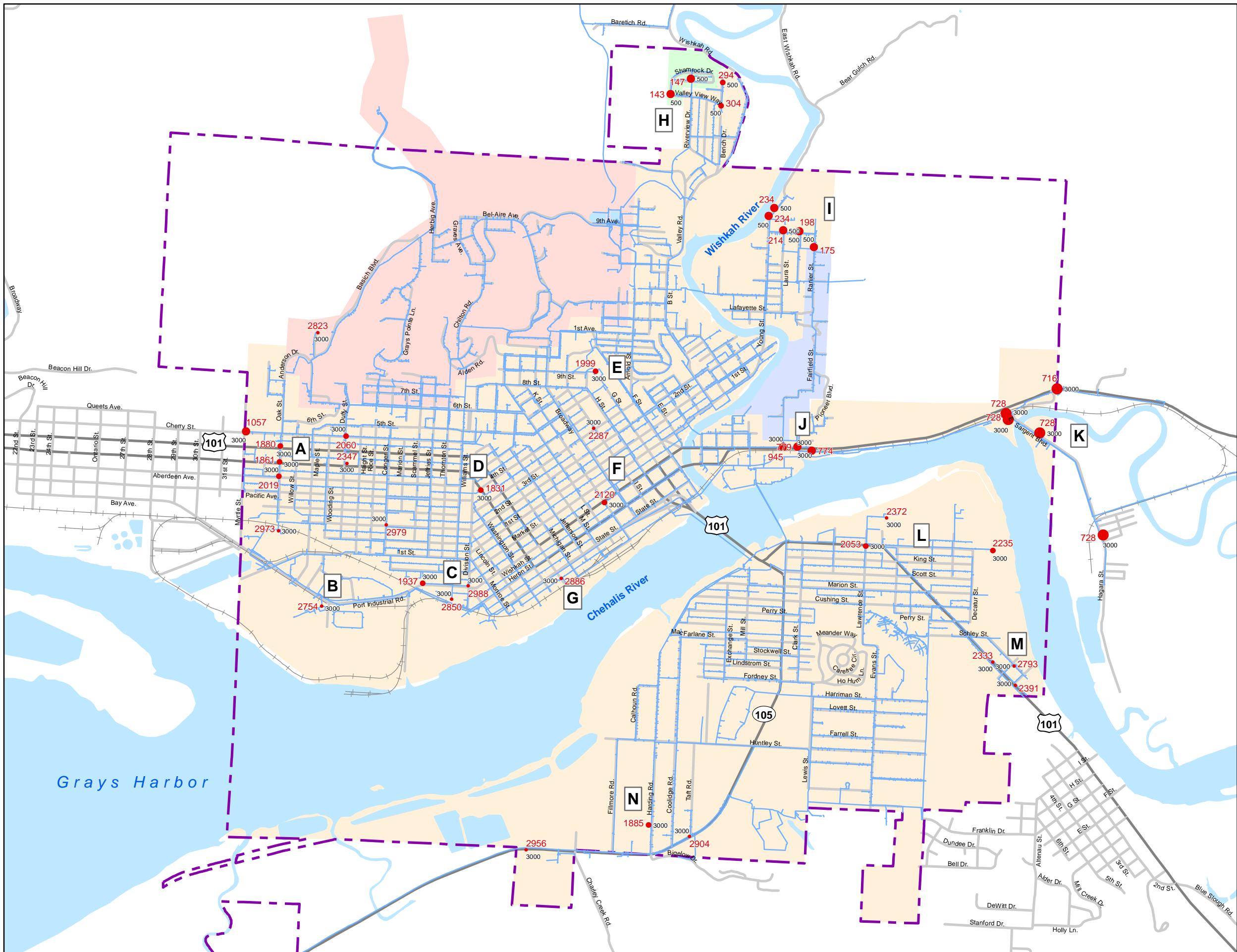


Figure 7-4

2020 Fire Flow Map

CITY OF ABERDEEN

WATER SYSTEM PLAN

March 2021



0 750 1,500 3,000
Feet

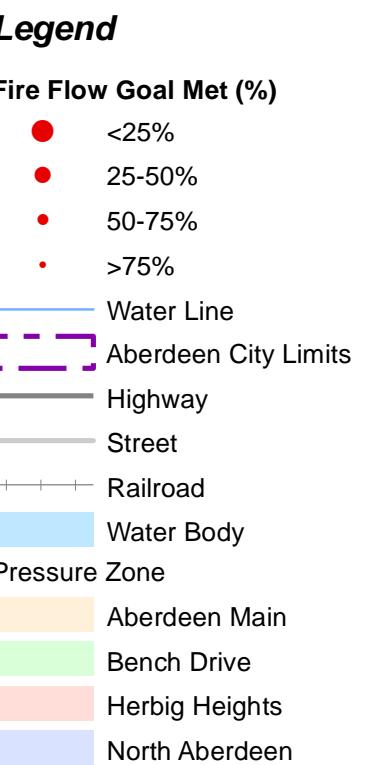
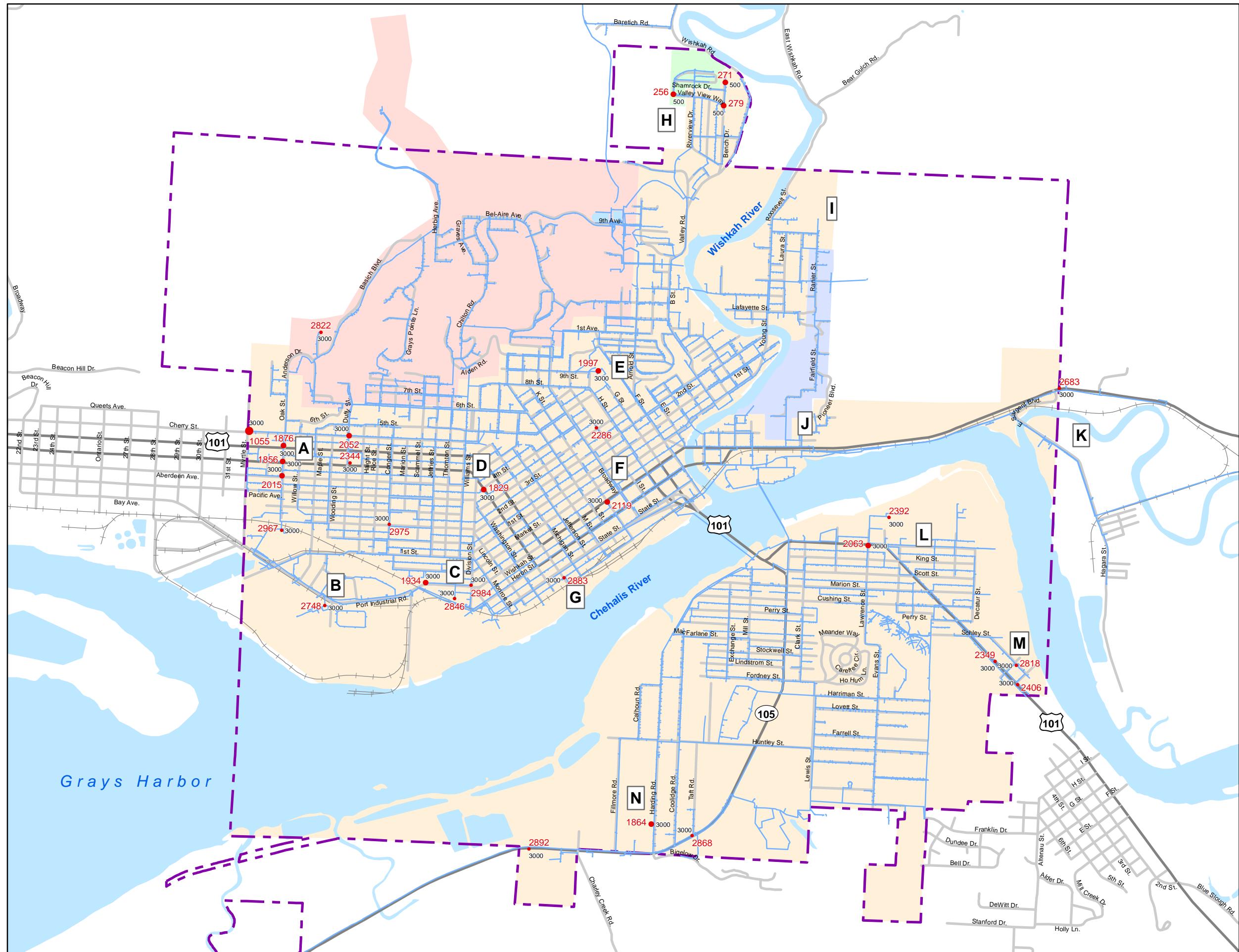


Figure 7-5

2040 Fire Flow Map

CITY OF ABERDEEN

WATER SYSTEM PLAN

March 2021



0 750 1,500 3,000 Feet

Table 7-14. Fire Flow Analysis Results at Key Locations

Pressure Zone	ID	Location	Pipe Diameter (in)	Notes	Fire Flow Goal (gpm)	2020 Available Fire Flow (gpm)	2040 Available Fire Flow (gpm) ⁽¹⁾	Improvements
Low Level	A	Multiple Hydrants along Hwy 101	6" and 8"	3000 gpm goal on 6" and 8" waterlines	3000	1,057-2,2973	1,055 - 2,967	No improvement. Multiple hydrants available to satisfy goal.
Low Level	B	Port Industrial Rd	8"	Hydrant on dead end 8" waterline	3000	2,754	2,748	No improvement. Multiple hydrants available to satisfy goal.
Low Level	C	Wishkah St West of Division	6" and 8"	3000 gpm goal on 6" and 8" waterlines	3000	1,937-2,988	1,934-2,984	No improvement. Multiple hydrants available to satisfy goal.
Low Level	D	Hwy 101 S and 4th St	6"	Hydrant on dead end 6" waterline	3000	1,831	1,829	No improvement. Multiple hydrants available to satisfy goal.
Low Level	E	9th St and H St	6"	3000 gpm goal on 6" waterline	3000	1,999	1,997	No improvement. Multiple hydrants available to satisfy goal.
Low Level	F	Multiple Locations	6"	3000 gpm goal on 6" waterlines	3000	2,120-2,287	2,119-2,286	No improvement. Multiple hydrants available to satisfy goal.
Low Level	G	Alder St	6"	3000 gpm goal on 6" waterline	3000	2,886	2,883	No improvement. Multiple hydrants available to satisfy goal.
Low Level	H	Valley View Way and Bench Dr - Multiple locations.	4" and 6"	Hydrants are limited by low available pressure and the Bench Dr pump station capacity.	500	147-304	256-279	No improvement. High elevations in area limit flow.

Pressure Zone	ID	Location	Pipe Diameter (in)	Notes	Fire Flow Goal (gpm)	2020 Available Fire Flow (gpm)	2040 Available Fire Flow (gpm) ⁽¹⁾	Improvements
Low Level	I	Roosevelt St and Forsythe St - Multiple Locations	6"	Hydrants are limited by nearby service elevation	500	175-234	>500	D-14 installs PRV from North Aberdeen
Low Level	J	Hwy 12, Fleet St and Tyler St - Multiple Locations	6" and 12"	Dead end waterline along Hwy 12 is connected with a 6" waterline that limits fire flow capacity	3000	779-945	>3,000	D-16 installs 1,150 LF of 12" along Hwy 12 from Chehalis St to Fleet St. River
Low Level	K	Junction City Rd	12"	Hydrants are limited by 6" connection for this dead end waterline	3000	716-728	>3,000	D-15 installs river crossing from Curtis to Hagara and D-16 installs 1,150 LF of 12" along Hwy 12 from Chehalis St to Fleet St.
Low Level	L	Curtis St - Multiple Locations	6" and 8"	3000 gpm goal limited by 6" and 8' dead end water lines	3000	2,053-2,372	2,063-2,392	No improvement. Multiple hydrants available to satisfy goal.
Low Level	M	Hwy 101 and Polk St between Schley St and Taylor St	6" and 8"	3000 gpm goal on 6" and 8" waterlines	3000	2,333-2,793	2,349-2,818	No improvement. Multiple hydrants available to satisfy goal.
Low Level	N	Harding Rd	6"	3000 gpm goal on 6" waterline	3000	1,885-2,904	1,864-2868	No improvement. Multiple hydrants available to satisfy goal.

(1) Fire flow available once improvements noted in next column are implemented.

8. Operations and Maintenance

8.1 Organizational Structure

The Public Works Department has responsibility for the management and operation of the City of Aberdeen's (City) water system. Exhibit 8-1 provides a diagram of the organizational structure of the Public Works Department.

The Public Works Department is headquartered at City Hall and is headed by the Public Works Director. Responsibilities of this position include overall management of all water, wastewater, engineering, and transportation services including implementation of City policy.

A Public Works O&M Manager, under the direction of the Public Works Director, organizes and administers the day-to-day operation and maintenance (O&M) of the water system.

The administrative department reviews each description on a periodic basis to ensure it is current and accurately describes the position within the existing organizational structure.

8.2 Personnel Certification

According to Chapter 248-55 Washington Administrative Code (WAC), Water Works Operator Certification, public water systems with more than 100 services are required to have a certified operator. Certified personnel are required for positions that are in direct charge of public water systems or major segments of a large system. These certified personnel are responsible for monitoring and/or improving water quality.

The City is in full compliance with all the laws and regulations regarding staff certification and training. City staff meet or exceed all required classifications. The positions required to be filled by certified operators, the required classifications, and the classifications of current personnel are shown in Table 8-1.

The City has a continuing education program to help employees qualify for higher levels of education and actively encourages employees to achieve the highest levels of certification possible.

Table 8-1 Certified Operator Positions, Required Classifications, and Current Personnel Classification

Position	Staff Member	Required Classification	Classification of Current Personnel
Water Systems Chief Operator	Bruce Davis	WTPO 3 and WDM 3	CCS, WPTO 3, WDM 3
Customer Service Supervisor	Tyson Burgess	WDM 2 and CCS	WDM 2 and CCS
Water Maintenance Supervisor	Brett Bradley	WDM 2	WDM 2 and WTPO 2
Lead Operator	Dave Nelson	WTPO 2	WDM 2 and WTPO 2
Lead Operator	Brian Matisons	WTPO 2	WTPO 2
Lead Operator	Kevin Lawrence	WTPO 2	WTPO 2
Shift Operator		WTPO 1	WTPO-1

8.3 Routine Operations

8.3.1 General

The City has a well-organized system of day-to-day monitoring and inspection to ensure the water system is kept in good operating condition. Troubleshooting, adjustments, and repairs are also a part of the daily operations program. The Public Works O&M Manager directs Water Department staff in carrying out daily O&M activities. Routine operational procedures for various system components are described as follows.

8.3.2 Source of Supply

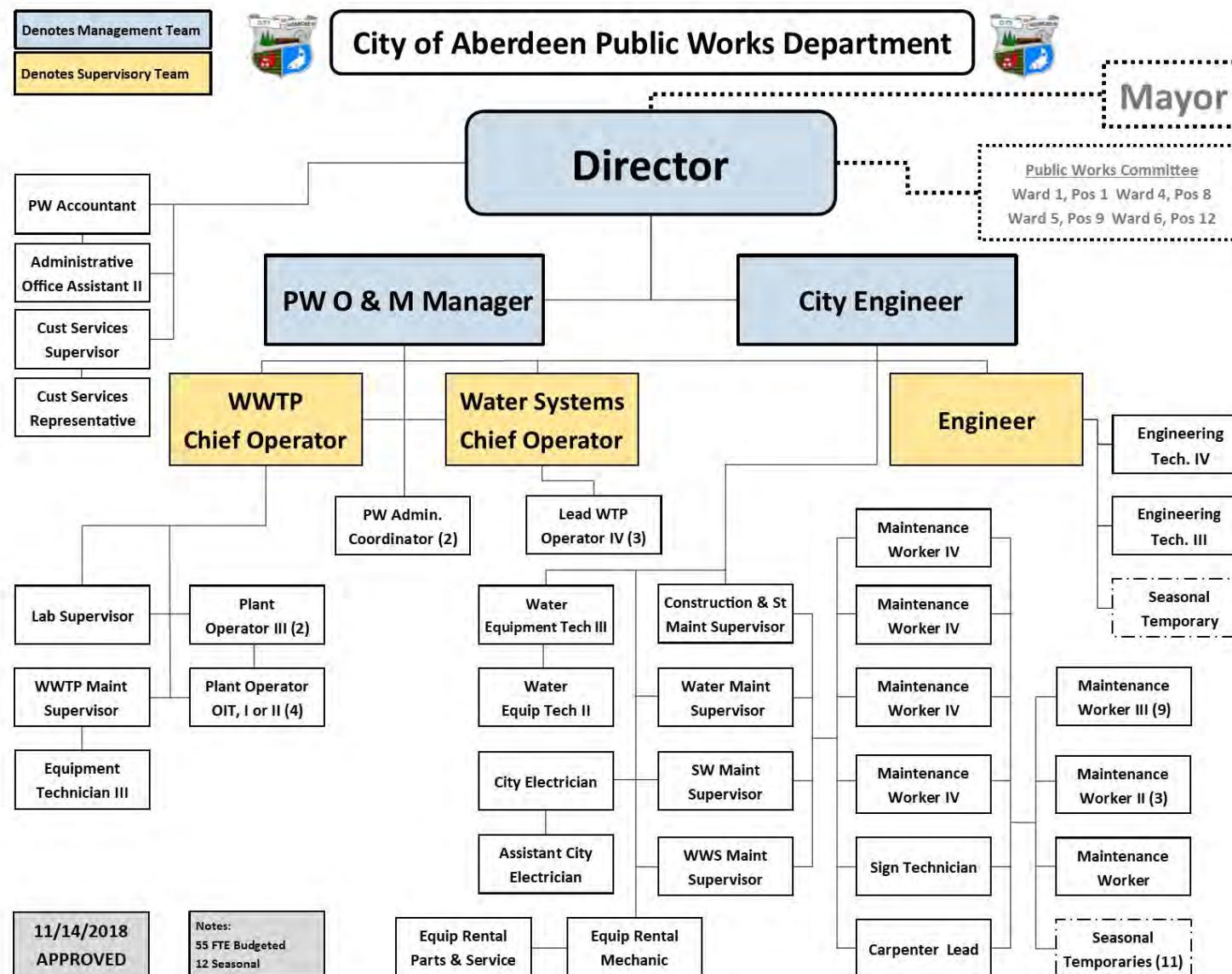
The Wishkah Headworks is monitored by City staff that inspect the facility 2 times per week. There is a family that lives on the property that also performs grounds maintenance.

The City recently installed remote telemetry to monitor lake levels, intake screen blockage, ambient temperature, and precipitation. The telemetry unit also monitors and adjusts the position of two feed control valves, one at the headworks and one at the WTP. An associated telemetry system relays all essential information between Headworks, WTP, and the Water Department shop office. The 28-inch gravity supply line route from the headworks to the WTP is inspected twice a year and vegetation control is performed on an as-needed basis.

8.3.3 Treatment Operations

Daily WTP operations include testing, calibrating, and confirming the Supervisory Control and Data Acquisition (SCADA) readings for chlorine, pH, and fluoride residuals, as well as volumes used for sodium hydroxide, chlorine, and fluoride. Other daily operational items may include, but are not limited to, plant flow adjustments, individual membrane filter cleanings, maintenance on the air compressors, backup diesel generator, various feed and wastewater pumps, pre-screens, etc.

Figure 8-1 Organization Chart



8.3.4 Finished Water Storage

Daily reservoir checks are carried out to monitor water levels and to verify physical security. Operators check fences, gates, and locks for evidence of intrusion. They also inspect chlorination systems and turbidity monitors at the Fairview reservoirs. All reservoirs are in a maintenance program that includes a diver inspection every three to five years.

8.3.5 Booster Facilities

Each booster pump station is inspected weekly. These inspections include checking pumps, pressure gauges, and controls as well as observing and documenting the overall physical condition of the station.

8.3.6 Service Meters

Water service meters are inspected in response to customer requests or when other evidence suggests a meter is malfunctioning. Larger meters (larger than 1-inch) are tested and calibrated on a regular basis as recommended by the manufacturer.

8.4 Emergency Response Plan

The Washington Department of Health (DOH) requirements for a Water System Plan (WSP) specify that an Emergency Response Plan (ERP) be included in the Operations Program. The purpose of an ERP is to guide personnel in anticipating and responding to system malfunctions, natural disasters, and other events affecting routine water system operations.

The major elements of an ERP include a description of system vulnerability, a contingency plan, and a summary of emergency response procedures. Because potential emergency situations are varied, it is important to develop a response plan that incorporates sufficient flexibility to adapt to a wide range of conditions. Proper staffing, training, and communication, as well as a suitable inventory of maintenance and repair parts, are also basic to a successful ERP.

The City establishes a watch schedule to ensure that a responsible contact is available to handle system emergencies at any time.

8.4.1 Vulnerability Overview

A vulnerability assessment of the water system has been completed by the City. The assessment identifies major system components and describes conditions that could result when facilities fail to operate or perform as designed.

The buildup of sediment behind the Malinowski Dam at the intake decreases the operational storage volume available for the water system. This primarily a concern during the period of minimum seasonal low river flow.

Contamination from land use practices, landslide, flooding, earthquakes, accidental spills, hazardous substance introduction, vandalism, cyber attack, power outages, mechanical failure

of pumping equipment, loss of key personnel, and gravity main breaks are considered to be the more significant threats to water system facilities.

8.4.2 Emergency Notification

The Public Works Department has prepared and regularly updates an emergency notification information packet. A copy of this packet, with up-to-date telephone numbers, is displayed at the Public Works office at City Hall as well as the water shop, police department, fire department, and at the Wishkah headworks. In the event of an emergency, additional personnel are assigned as deemed necessary.

8.4.3 General Field Response

The initial reaction by City personnel to an emergency is to take prompt action to remove or mitigate any immediate threat to public health or safety. Where appropriate, bystanders may be warned, traffic diverted, valves shut off, dangerous materials isolated or removed, or other necessary action taken provided it can be done without further risk to the public or to City personnel.

Concurrent with these initial steps, the Public Works O&M Manager is contacted and informed as to the damage and apparent cause. The Manager then dispatches a crew to isolate the problem or damaged facility. Meanwhile, on-site crew members perform a more thorough damage assessment to develop and evaluate potential courses of corrective action including which materials and equipment may be necessary to implement various alternatives. It is frequently necessary to decide between a temporary solution that can be accomplished quickly and a permanent one that may take more time. To support these essential evaluations, the City's repair supplies inventory and a list of materials suppliers is kept up-to-date and is readily accessible to avoid unnecessary delay in restoration of service.

Throughout any emergency, radio contact is maintained among work crews, the Public Works O&M Manager, and other key participants to enhance coordination of the corrective effort. City department heads are notified of emergencies and updated on progress towards restoration so that they may assess impacts to their jurisdictions and, if necessary, issue appropriate public notifications.

8.4.4 Emergency Response Actions

Actions to be taken in response to several emergency situations are described below.

Emergency: Earthquake

Description

A major earthquake, with a magnitude of 5.0 or greater on the Richter scale, and an intensity of 9 or greater on the Modified Mercalli scale, could disrupt the source, transmission, pumping, treatment, storage, and distribution components of the water system. In addition, power failures and interruption to conventional transportation and communication systems may occur.

Response

Water system personnel and facilities anticipate critical water use needs for fire fighting and medical facilities resulting from an earthquake. These critical needs are given due priority in assessing damage reports and organizing repair efforts. Crews are trained and equipped to maintain constant radio contact, barricade hazardous areas, close valves to isolate broken mains, move soil and debris, turn off water services, and make repairs. They are also trained and prepared to aid residents in securing temporary supplies of safe drinking water. The City's ample treated water storage capacity is an important resource. That storage can be utilized until sources that may have been inactivated by earthquake, flooding, or other natural disasters can be returned to service.

In the event of an earthquake, water system personnel are trained to perform thorough equipment and facility inspections and to research and identify any unexplained drop in line pressure, reduction in flow rate, pump failure, leakage, or other signs of damage. Pipelines and other buried facilities are hidden from view but are at least as susceptible to ground movement as aboveground structures. Thus, buried facilities require careful inspection following any earthquake.

Emergency: Treatment Plant Chemical Spills

Description

- Fluoride saturation tank or dosing pump leak
- Chlorine gas leak
- Sodium hydroxide tank or dosing pump leak

Response

The fluoride saturation and sodium hydroxide tanks are located in a separate chemical containment room at the WTP. In the event of an accidental spill or leak, the chemical solution flows into a catch basin. The solution is then pumped outside to a large ditched containment area, and when this sump pump is activated, an alarm is sent through the SCADA control system to all City staff on emergency call. The Washington State Department of Ecology (Ecology) - Hazardous Spills Division would also be notified.

The chlorine gas is delivered on-site in one-ton cylinders. These cylinders are then loaded into a separate cylinder containment vessel. This room is also isolated from the rest of the WTP. In the event of a chlorine gas leak, there are several gas detectors that are also connected to the SCADA control system which automatically shut-down the necessary valves connected to these containment vessels and activate a call-out alarm. Numbers posted to call are Emergency 911 and Aberdeen Fire Department and HazMat Team.

Emergency: Flooding

Description

The City location at the mouths of the Chehalis and Wishkah Rivers makes it potentially vulnerable to floods in either drainage basin. The largest potential flood impact on the City's water system is washout of key piping facilities, particularly at river crossings. Other problems can accrue from loss of power, high turbidity at the Wishkah source, and inundation of facilities. Important impacts include overload of the wastewater plant, inundation of other structures, transportation disruptions, and competing demands on City resources.

Response

Water personnel are trained to anticipate which facilities are most likely to be impaired by flooding. In the event of a flood, all major system components are checked thoroughly to assess physical damage as well as evidence of contamination. Particular attention is directed to areas where water mains cross flooded streams. Once collected, damage reports are evaluated and prioritized to focus on items that require immediate attention to assure continued water service.

Crews are trained and equipped to maintain constant radio contact, construct temporary diversion dams, barricade hazardous areas, shut off valves to isolate broken mains, pump or bail flooded facilities, move soil and debris, turn off individual water services, and make repairs. They are also trained and prepared to aid residents in securing temporary supplies of safe drinking water.

Emergency: Power Failure

Description

Short- and long-term interruptions in power supply can occur for a variety of reasons and may or may not be associated with emergencies that would otherwise affect the water system. In addition, power outages may be localized to one or more blocks or may affect the entire region. Facilities most affected by this type of emergency include: water treatment, booster pumping, telemetry equipment, and communications systems.

Response

In addition to staging appropriate field responses, water personnel are trained to immediately contact the Gray's Harbor Public Utility District to determine the nature, extent, and expected duration of a power outage. The WTP includes a diesel-powered generator sized to provide backup power for all essential treatment system equipment items. The presence of this backup generator, combined with the fact that source water and treated water flow by gravity in the City's system, supports a continued supply of treated water to the Fairview reservoirs during extended power outages.

Fairview reservoir storage is sufficient to enable more than a week of uninterrupted water service to the low level zone. Depending on usage, it is feasible that the Herbig Heights and north Aberdeen zones could also be served for several days from the existing reservoirs. Storage for the Bench Drive area, however, is more limited. Thus, it would be necessary to mobilize a source of temporary backup power to maintain water service for that area during any extended power outage.

Emergency: Contamination of Source of Supply

Description

Contamination can occur in the surface supply system and may be the result of man-made practices or natural occurrences. The Wishkah source is vulnerable to landslides or other erosional events in the watershed in conjunction with heavy precipitation and periods of high run-off that seasonally occur in the fall, winter, and spring months. Contamination may also result from petroleum or other chemical spill in the watershed.

Response

Initial response to source contamination includes isolating the source from the rest of the system. Next, an assessment is performed to determine the specific cause and remove it as quickly as possible. This may be a simple matter such as in the event of a minor spill or may require a long period of time, resources, and specialized assistance for larger, more complicated problems. Appropriate measures for source removal and site cleanup are developed and evaluated according to the type, location, nature, and entry path of the contaminant.

In addition to their field response, City personnel are trained to ensure that appropriate health authorities are contacted. The health authorities, in turn, determine the extent of contamination in the system and guide the City in preparing and implementing an appropriate public information program.

Emergency: Gravity Line Failure

Description

Rupture or excessive leakage in the gravity supply lines from the Wishkah source to the WTP, and from the WTP to the Fairview reservoirs could result from corrosion, pressure surge, construction accident, vacuum collapse, earthquake, bomb blast, vandalism, stream erosion, or material failure. A major break would result in interruption to a major source of supply and present a flood and erosion threat to adjacent landowners.

Response

Such an event requires prompt action by City personnel to isolate the damaged section and thus minimize the impact to the rest of the system. The City has a large volume of reservoir storage, both in town and at the WTP for serving Wishkah valley customers. Thus, a temporary

loss of either pipeline would usually not cause a water shortage for any system customer unless it occurred during peak demand periods.

Emergency: Fairview Hill Reservoir Failure

Description

A sudden failure of one or both Fairview reservoirs could present an immediate flooding threat to nearby residents. Such a failure of two smaller, yet similar, reservoirs owned by the City of Centralia occurred in October 1991. The Centralia event resulted in extensive damage to homes and property over an area of several blocks. Such a failure of the City's reservoirs could be caused by a foundation failure, washout, construction accident, earthquake, bomb blast, vandalism, or material failure. A sudden breach of storage facilities collectively containing 25 million gallons (MG) of water has a high flooding potential.

Response

Such an event requires prompt action by City personnel to warn and protect the public from harm as well as to notify appropriate health and safety agencies. Other necessary duties include isolating the rest of the system from the reservoirs, checking the distribution system for evidence of contamination, notifying DOH, and providing information to the public and media.

8.4.5 Public/Press Information

As a public water supplier, the City has an obligation to properly inform its customers of emergencies that may affect water service. It is essential that this information is clear, accurate, and expressed in a responsible manner. Whenever possible, press releases and other public statements are prepared in advance and delivered to customers. The City also delivers information to customers through its annual CCR.

8.5 Source Water Protection Plan

The City's Watershed Control Plan has been approved by DOH (see Appendix E). A copy is available upon request.

8.6 Routine and Preventative Maintenance

The City follows an established schedule for monitoring and maintaining facilities throughout the treatment and distribution systems. Good preventative maintenance has proven to be cost-effective as well as an efficient means of avoiding emergency conditions. By following a set schedule of maintenance activities, the City ensures efficient and reliable system operation extends the service life of equipment items, and monitors for early signs of mechanical breakdown.

Records of maintenance activities are kept for treatment facilities, transmission lines, reservoirs, valves, hydrants, pumps, meters, and cross-connection control devices.

Preventative maintenance also encompasses security measures to prevent or discourage unauthorized use, theft, or vandalism of City facilities. All major equipment and facilities are enclosed and securely locked while unattended. This includes all buildings, vaults, reservoirs, material storage areas, and fences designed to secure such facilities. Major in-town facilities are also included in routine police department security patrols.

Security at the Wishkah source is important to minimize the possibility for accidental or deliberate contamination, to maximize the protection of system integrity, and to minimize liability to the City due to intruder/injury cases. The City will be installing security cameras and an improved communication system at the source. Staff visit at least twice a week to perform maintenance and inspection. The City rents out the former caretaker residence at the site to private individuals. The rental agreement includes limitations and requirements with respect to living adjacent to the intake for the domestic drinking water system.

8.7 Water Quality Violation Response Procedures

The City is required to take twenty monthly samples as required by the DOH. Samples are normally taken the first and third weeks of the month, but this may vary depending on weather conditions.

The sample site locations are:

1. Cherry and Maple	7. 1300 Block of E Wishkah
2. Heron and Monroe	8. SW Blvd and Hogan
3. Chilton and Gordon	9. 1700 Block of Coolidge
4. 800 Block of Shamrock	10. Water Filtration Plant (Treated Water Line)
5. 4th Ave. and Robert Gray Plant	11. Raw Water Sampling Station at Water Filtration
6. 1800 Block of Young	

1st Week Sampling Sites: 1-2-3-4-5-6-7-8-9-10-11-12

2nd Week Sampling sites: 1-2-3-4-5-6-7-8-9-10-11-12

In the event of a bad sample, three individual repeat samples will be taken from the same dedicated sampling location consecutively and at the same time and all samples must pass. The City has previously coordinated with DOH and DOH has approved that the City's repeat sample sites are the same as the routine sample sites (repeat samples are not taken from nearby locations within 5 upstream or downstream connections).

In the event of two violations (bad samples) in one month, a public notification is required. Public notification is discussed in Section 8.8.

In the month following the unsatisfactory sample, 20 repeat samples are required. The City meets this requirement by collecting 20 routine samples each month.

8.7.1 Inorganic and Organic Chemicals

When an average of four samples exceeds the maximum contaminant level (MCL), the City must report to State *within 48 hours* and notify the public, collect three additional samples within one month.

8.7.2 Turbidity

When turbidity exceeds the MCL, the City must resample the system within one hour. If the repeat sample confirms MCL exceedance, the City must report to DOH *within 24 hours*. Use repeat sample to calculate monthly average. If MCL is exceeded, the City must report to DOH *within 24 hours* and notify public.

8.7.3 Coliform

Initiate at least three consecutive repeat samples from the same sampling station. All three repeat samples must show no positive results. When the presence of coliform is confirmed in any check sample, the City must report to DOH *within 24 hours*. When the MCL is exceeded, the City must report to DOH *within 24 hours* and notify public. The City's Monitoring Plan (CMP) is presented in Appendix K.

8.7.4 Radionuclides, Pesticides and Trihalomethanes

When radionuclides or trihalomethanes exceed the State MCL, the City must report to DOH *within 48 hours* and notify public.

8.7.5 Corrosivity

In the event of corrosivity violation, the City must notify DOH, evaluate the situation, and establish corrective program. If daily sampling confirms MCL, the City must notify the public.

8.7.6 Summary

In any case of contamination violation or MCL exceedance, the City must perform verification procedures as required. If exceedance is confirmed, the City must identify the problem and initiate corrective action. The requirements identified in this section are subject to change based upon changes in water quality requirements.

8.8 Public Notification

Although each public notification should be developed with the assistance and concurrence of the DOH District Engineer, the example and samples illustrate important categories of information to be included. At a minimum, the notification should state the sampling criteria, identify what corrective measures have been taken, and inform the customers what, if any, precautionary steps should be taken. In all cases, the DOH District Engineer should be consulted before issuing public notices.

Following are sample notices to be used as a format example.

Sample Notification 1
Unacceptable Coliform Bacteria Concentrations

State the Problem	The Department of Health Services has notified Aberdeen that water samples taken from the water system do not comply with water quality standards of the State of Washington under the Federal Safe Drinking Water Act. The samples contain unacceptable levels of coliform bacteria, and therefore, are considered to constitute a health hazard.
What to do?	It is therefore suggested that the users of the water system take the following precautions: <input type="checkbox"/> Add four drops of household bleach to one gallon of drinking water, mix, and let stand 1 hour before using, <i>OR</i> <input type="checkbox"/> Boil water used for drinking and cooking. Bring to a full rolling boil for 3-5 minutes and allow to cool as desired.
What Precautionary steps are being taken?	The City is presently taking steps to reduce the contamination. Continued testing will be done to monitor the problem and notification will be given when the contamination has been eliminated.
What corrective steps are being taken?	The City has increased the frequency of monitoring water quality to see if it is a recurring problem. The system is also being examined to identify and eliminate any potential cross-connections.
Further information?	If you have further questions, please contact the City at (360) 537-3274.

Sample Notification 2
Insufficient Number of Samples

State the problem	The City has been notified by the Department of Health Services that an insufficient number of bacteriological water samples were taken during the month of [insert the month].
By what authority?	WAC 248-54-165 of the Rules and Regulations of the State Board of Health Regarding Public Water Supplies requires a water utility of the size of the City of Aberdeen to take a minimum of 15 bacteriological samples per month.
When?	During this time we experienced trouble in transporting the samples to the testing laboratory. Although all water samples taken before and after the month of [insert the month] were free from contamination, WAC 248-54-255 of the above regulations requires that we notify our customers of the situation.
What corrective steps are being taken?	Every step has been taken to correct the situation, and we have established alternate transportation methods for future use.
What precautionary steps should be taken?	Meanwhile, there is no occasion for alarm, and we will continue to serve you water of the highest quality.
Further Information	If you have any questions, please contact the City at: (360) 537-3274.

8.9 Recordkeeping

The City is also responsible for maintaining certain records for specified time periods. These requirements are listed in Table 8-2. The City has a standing policy to forward any recordkeeping issues directly to the DOH Regional Engineer.

Table 8-2 Retention of Operational and Analytical Records

Measurement or Event	Record Retention Period
Water Flow Meter Readings to and from the System	3 years
Bacteriological Analysis	5 years
Turbidity Analysis	5 years
Chemical Analysis	10 years
Records of Action (s) Taken to Correct an MCL Violation	3 years after the violation
Customer Complaints	3 years
Pipeline Flushing	3 years
Backflow Prevention Program and Devices	3 years
Sanitary Survey Data	10 years after survey completion
Records Regarding a Variance or Exemption	10 years following expiration of the Variance or exemption
Records Concerning Public Notification	3 years after the date of the Notification
Chlorine Residual	3 years
Maintenance and Construction Documentation	5 years

8.10 Customer Complaints

The City has developed and practices a systematic approach to handling water system customer complaints. Each call is handled by a knowledgeable staff member who is familiar with system components and who has information concerning typical as well as actual system operating conditions. Records are kept to document each customer complaint and the follow-up actions undertaken to correct the problem.

8.11 Cross-connection Control Program

The City's cross-control program was established on January 15, 1992. The ordinance requires that all cross-connections be eliminated or protected by an approved backflow preventer. It also holds "the owner of the property in which a cross-connection occurs...responsible for any property damage or personal injuries which result from backflow which occurs as a result of the cross-connection."

It directs that cross-connection control devices be inspected and tested at least annually be a certified tester at the expense of the utility customer. Completed test reports are to be submitted to the City Water Department. It further states that "failure of a water utility customer to cooperate in the installation, maintenance, repair, inspection or testing of backflow prevention devices shall be grounds for immediate termination of water services to the premises."

Categories of cross-connections requiring backflow prevention are defined by State law and the required backflow protection devices must be a model approved by the DOH.

A backflow prevention assembly in service, but not currently listed, may remain in service provided the assembly:

- Was listed on the DOH and/or USC list of approved backflow prevention assemblies at the time of installation
- Has been properly maintained
- Is a type appropriate for the degree of hazard
- Has been tested at least annually and has successfully passed the annual tests

The City's cross-connection control program is under the responsibility of the Customer Services Supervisor who is a certified Cross-connection Control Specialist I. The program consists of site inspections for potential cross-connections, plan review of new construction projects, and regular testing of the backflow preventers already installed within the system. The City's cross connection control program is presented in Appendix L.

8.12 Design and Construction Standards and Specifications

The Public Works Department conducts all construction of water mains and appurtenances in accordance with City standards, applicable American Water Works Association (AWWA) specifications, and Section 8-11 of the Washington Department of Transportation (WSDOT)/American Public Works Association (APWA) Standard Specifications.

These requirements are intended to meet or exceed the design and construction standards referenced in WAC 246-290. Use of these materials and application of this City policy is intended to meet the requirements of the DOH Submittal Exception Process for distribution main construction. By qualifying for this process and following the approved procedures and standards, the City is provided a waiver from the requirement of DOH approval of individual projects.

8.13 Consumer Confidence Reports

All Group A water systems are required to provide a report to their customers once a year. The Consumer Confidential Report (CCR) is basically a short, educational summary of the results of water quality monitoring that a system conducted during the previous year. This report is due July 1st of each year. An example of a previous report is available upon request.

8.14 Water Supply Contingency Plan

The City's Water System Contingency Plan is presented in Appendix M.

8.15 Operation and Maintenance Deficiencies

Annual O&M improvements identified by the City are budgeted in the O&M section of the water system budget.

9. Capital Improvement Program

This chapter describes the methodology used in developing the City's water system Capital Improvement Program (CIP), and presents the costs and schedules for projects planned for implementation between 2020 and 2039.

9.1 Development of CIP

The CIP was prepared by first identifying projects that address water system needs or deficiencies, as documented in earlier chapters of the water system plan. In addition, recurring or periodic capital projects related to system maintenance (e.g., reservoir maintenance and leak detection) have also been included in the list of improvements.

A 20-year implementation schedule of the projects was then developed. Generally, projects of higher priority (i.e., those that address current system needs) were scheduled for implementation within the ten-year planning horizon (2020-2029). Projects that serve anticipated future needs associated with system growth, or are less critical to system operation, were scheduled for implementation between 2030 and 2039. Detailed scheduling of the higher priority projects was based primarily upon the City's existing forecast of project implementation timelines. Where applicable, the timing of water system projects has been coordinated with sewer and street improvements planned for the same locations.

Planning-level (AACE¹ Class 4) cost estimates have been developed for each capital project included in the 2020-2039 CIP. Generally, each project cost includes the following components:

- **Base construction cost.** Includes all labor and material costs needed to construct a project. For pipeline and valve projects, construction costs were estimated based upon unit construction costs derived from bid tabulations for recent and similar southwest Washington water distribution projects.
- **Sales tax.** Calculated as 9.08 percent (the November 2020 local tax rate) of the base construction cost.
- **Construction contingency.** Takes into account the uncertainties associated with estimating project costs at this planning level. Calculated as 30 percent of the total of base construction plus sales tax.
- **Design engineering.** Includes City and consultant design costs, and other related cost items, such as permitting and construction administration. For most projects, this is calculated as 25 percent of the base construction cost. However, a higher percentage of the base construction cost is used for projects with more complex design or permitting needs.

These elements are summed to determine the total project-level cost estimate for a project, as expressed in 2020 dollars. Planning-level cost estimates are summarized in Table 9-1 and

project locations are indicated in Figure 9-1. Project D-1 does not appear on the map as it consists of many small projects in different locations.¹

To account for inflation and the increase of construction costs over time, the base project-level costs have been escalated to their anticipated year of construction. It is impossible to predict accurately the rate at which construction costs will increase over the 2020-2039 period; however, a conventional method to estimate such increases is to examine cost index trends of past years.

The City of Aberdeen performed a utility rate study in 2019-2020 to set utility rates to fund capital projects for years 2020 through 2025. The study recommended a cost escalation rate of 3% annually for determining future costs. This value is used to escalate construction project costs from base year (2020) dollars to costs in the anticipated year of construction.

¹ Association for the Advancement of Cost Engineering.

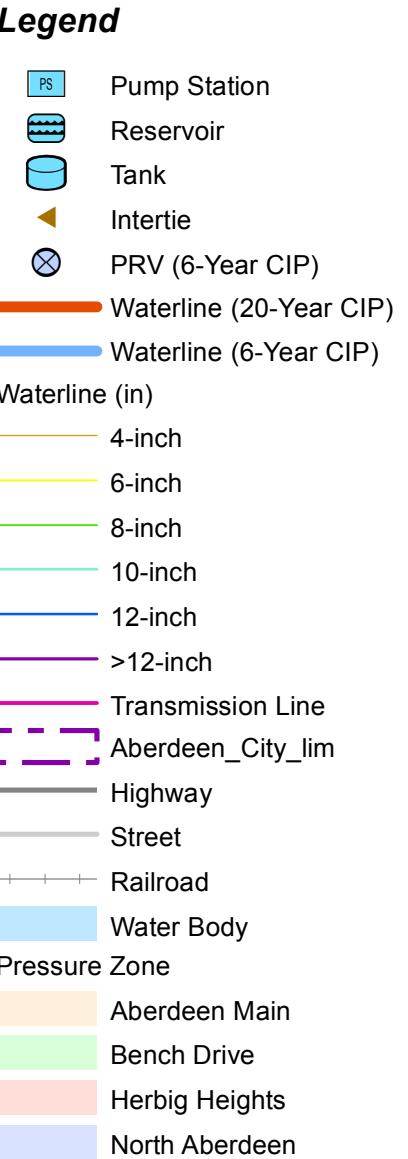
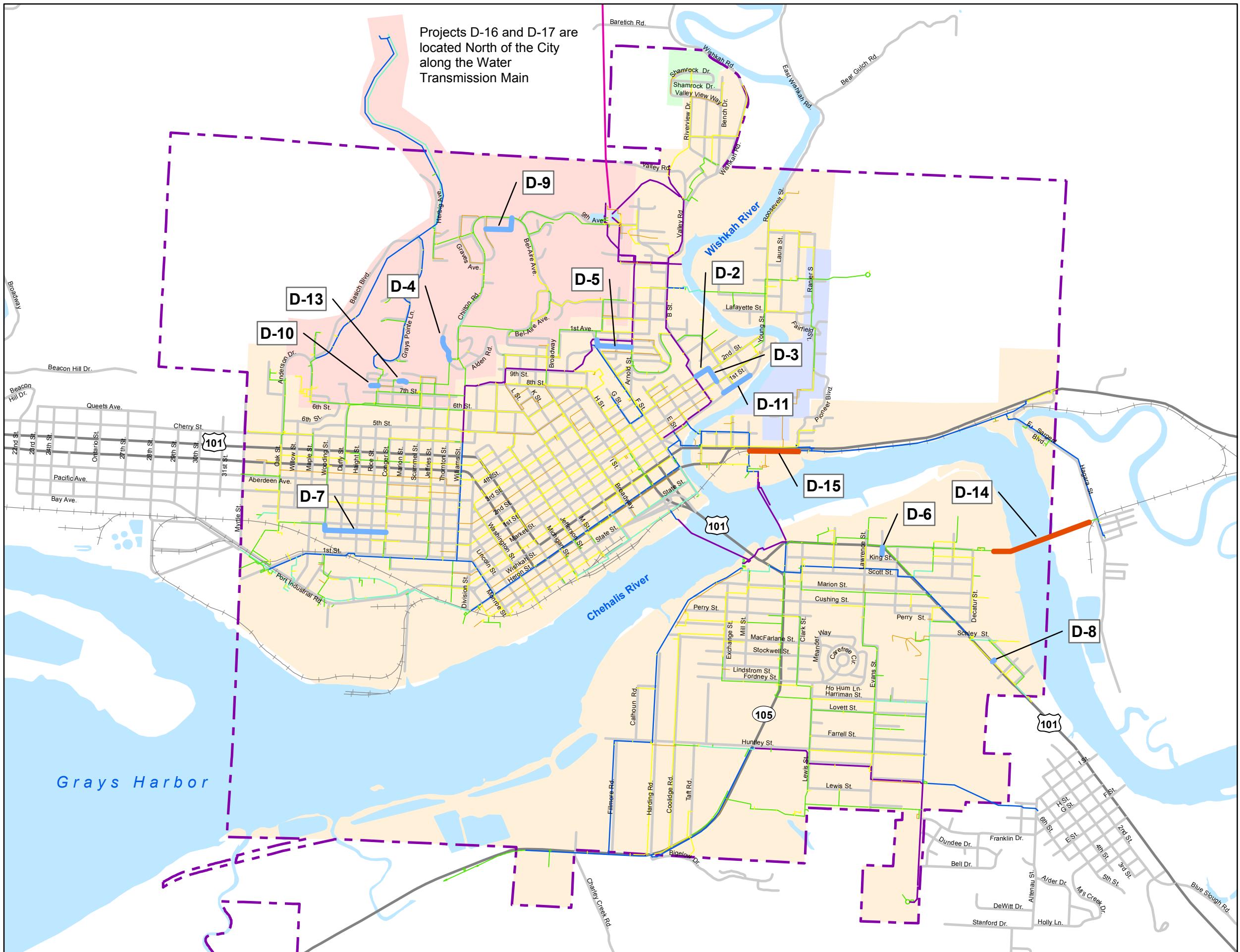
Table 9-1. Capital Improvement Program (2020 – 2039)

Project No.	Description	Purpose of Project ⁽²⁾	Financing Source ⁽³⁾	Base Project Cost (2020 Dollars)	Schedule and Cost of Improvements (in thousands of dollars) ⁽¹⁾													
					2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	10-yr CIP TOTAL	2030-2039 ⁽⁴⁾	20-yr CIP TOTAL	
	Water Maintenance and Operations																	
M-1	Water System Plan Update	O&M	OI	116	116										116	0	116	
M-2	WTP Hypochlorination System	O&M	OI	722		744									744	0	744	
M-3	Fairview Reservoir Floating Cover Replacement	O&M	LT	3,069		3,161									3,161	0	3,161	
M-4	WTP New Membranes (est. 2023, 2028, 2033, 2038)	O&M	OI	4,204			300	840							1,140	4,664	5,804	
M-5	Malinowski Reservoir Siltation Mitigation	O&M	OI	3,889	200	3,800									4,000	0	4,000	
M-6	Watershed Forestry Management	O&M	OI	1,337	387	50	50	50	50	50	50	50	50	837	680	1,517		
M-7	Re-Coating South Aberdeen Tank ⁽⁶⁾	O&M	OI	32											45	0	45	
M-8	Tank Inspection ⁽⁶⁾	O&M	OI	6											9	0	9	
M-9	Wishkah Headworks Security and Communication Improvements ⁽⁶⁾	O&M	OI	13											18	0	18	
M-10	Future Water System Plan Update ⁽⁶⁾	O&M	OI	95											135	135	0	135
M-11	DSL Reduction Strategies	O&M	OI	TBD											TBD	TBD	0	TBD
	Water Distribution System (Piping)																	
D-1	Small Diameter Replacement Program ⁽⁵⁾	Improve	OI	50	50	52	53	55	57	58	59	60	61	62	567	0	567	
D-2	2nd St from A St to B St (257 LF 6-inch) ⁽⁶⁾	Improve	OI	30											0	43	43	
D-3	A St from 2nd to 1st St (304 LF 6-inch) ⁽⁶⁾	Improve	OI	37											0	52	52	
D-4	Friedlander Dr (537 LF 6-inch) ⁽⁶⁾	Improve	OI	62											0	88	88	
D-5	Burleigh Ave from F and Hanna St to Arnold (959 LF 6-inch) ⁽⁶⁾	Improve	OI	109											0	155	155	
D-6	Evans St between Curtis and King (129 LF 6-inch) ⁽⁶⁾	Improve	OI	15											0	22	22	
D-7	Alley between Morgan and 2nd from Conger to Wooding (1,525 LF 6-inch) ⁽⁶⁾	Improve	OI	175											0	249	249	
D-8	Mead St West of SR101 (57 LF 6-inch) ⁽⁶⁾	Improve	OI	8											0	11	11	
D-9	Westerly Dr from Bel Aire Ave to Sherwood Ln (835 LF of 6-inch) ⁽⁶⁾	Improve	OI	96											0	137	137	
D-10	Isabel West of Rice St (298 LF 6-inch) ⁽⁶⁾	Improve	OI	35											0	51	51	
D-11	East Market from A St to Chicago (847 LF 6-inch) ⁽⁶⁾	Improve	OI	98											0	139	139	
D-12	Saturday St from 6th and Thursday (1,000 LF 8-inch) ⁽⁶⁾	Improve	OI	152											0	217	217	
D-13	8th St from Conger to Martin (353 LF 8-inch) ⁽⁶⁾	Improve	OI	54											0	78	78	
D-14	East Aberdeen River Crossing (2,500 LF 12-inch) ⁽⁶⁾	Deficiency	OI	1,315											0	1,875	1,875	
D-15	Hwy 12 - Chehalis St to Fleet St (1,200 LF 12-inch) ⁽⁶⁾	Deficiency	OI	274											0	390	390	
D-16	Transmission Main Isolation Valves ⁽⁶⁾	Improve	OI	317											0	452	452	
D-17	Transmission Main Replacement	Improve	OI	TBD											0	TBD	TBD	
Total Costs of Water System Improvements				16,311	753	7,807	403	945	107	108	154	119	129	247	10,772	9,303	20,075	

Notes:

(1) Costs are escalated from Base Project Cost (2020 dollars) to stated year of construction, assuming a 3.0% annual increase in costs.

- (2) Purpose of Project: Deficiency = Addresses deficiencies identified in the Water System Plan; Improve = Does not address a deficiency, but improves overall system operation; O&M = Necessary for proper system maintenance.
- (3) Source of Funding: OI = Operating Income (Rates); LT = Long Term Debt.
- (4) Total costs associated with projects implemented in 2030 through 2039. Specific years of project implementation are noted where applicable.
- (5) Includes annually budgeted amount to cover unspecified project costs. These costs are escalated per Note 1 to account for construction cost increases.
- (6) Costs escalated to year 2032 for work beyond initial ten-year planning period.



HDR

Figure 9-1
Capital Improvement Map
CITY OF ABERDEEN
WATER SYSTEM PLAN
March 2021

9.2 Planned Projects

9.2.1 Water Distribution System (Piping)

D-1: Small Diameter Pipe Replacement Program – This is an annual budgeted program to replace aging and small diameter piping in the system. The City has developed a list of piping targeted for improvement. Table 9-2 shows the list of projects identified for replacement between 2020 and 2029.

Table 9-2. Small Diameter Replacement Program

Address	Description
Cushing St between Boone and Crockett	Replace 250 LF of 1" and 1-1/2" Steel with 2" PVC
West Blvd between Hogan and Mead	Replace 600 LF of 2" CI with 2" PVC
1st and Maple	Replace 80 LF of 3" Steel with 6" DI
Willard to Stewart to Holmes	Replace 1,500 LF of Various Steel with 2" PVC
Between 1st and 2nd and Jefferies and Thorton	Replace 600 LF of 2" Steel with 2" PVC
Between Clark and Lewis and McFarlane and Schley	Replace 250 LF of 2" CI with 2" PVC
10th and Broadway and Spur	Replace 900 LF of Various Steel with 2" PVC
2nd between B and Grant	Replace 350 LF of CI with 2" PVC
2300 blk Victory Ave	Replace 275 LF of 1-1/2" Steel with 2" PVC
3700 Wishkah Rd	Replace 950 LF of 2" Steel with 2" PVC
Market and Williams	Replace 225 LF of 4" CI with 4" DI
2600 Wishkah Rd	Replace 650 LF of Various Steel with 2" PVC

D-2: 2nd Street – Install approximately 257 LF of 6-inch ductile iron (DI) water line on 2nd Street from A Street to B Street.

D-3: A Street – Install approximately 304 LF of 6-inch DI on A Street from 2nd Street to 1st Street.

D-4: Friedlander Drive – Install approximately 537 LF of 6-inch DI water line on Friedlander Drive.

D-5: Burleigh Avenue – Install approximately 959 LF of 6-inch DI water line on Burleigh Avenue from F and Hanna Street to Arnold Street.

D-6: Evans Street – Install approximately 129 LF of 6-inch DI water line on Evans Street between Curtis Street and King Street.

D-7: Morgan and 2nd Street – Install approximately 1,525 LF of 6-inch water line in Alley between Morgan and 2nd Street from Conger Street to Wooding Street.

D-8: Mead Street – Install approximately 57 LF of 6-inch DI water line on Mead Street west of SR101.

D-9: Westerly Drive – Install approximately 835 LF of 6-inch DI waterline on Westerly Avenue from Bel Aire Avenue to Sherwood Lane.

D-10: Isabel Way – Install approximately 298 LF of 6-inch water line on Isabel Way west of Rice Street.

D-11: East Market Street – Install approximately 847 LF of 6-inch DI water line on East Market Street from A Street to Chicago Avenue.

D-12: Saturday Street – Install approximately 1,000 LF of 8-inch DI water line on Saturday Street from 6th Street and Thursday Street.

D-13: 8th Street – Install approximately 353 LF of 8-inch DI water line on 8th Street from Conger Street to Martin Street.

D-14: East Aberdeen River Crossing – Install approximately 2,500 LF of 12-inch DI water line beneath the Chehalis River to connect the existing water line on Junction City Road to another on Curtis Street. This will create a second connection to the Junction City Road area. The project creates redundancy and address fire flow deficiencies along Junction City Road.

D-15: Highway 12 Fire Flow Improvement – Install approximately 1,200 LF of 12-inch DI waterline along Highway 12 from Chehalis Street to Fleet Street. This project addresses fire flow deficiencies at hydrants along Highway 12 east of Chehalis Street and along Junction City Road.

D-16: Transmission Main Isolation Valves – This project will add isolation valves along the transmission main between the intake at the Malinowski Dam, the Filter Plant, and the Fairview Reservoirs such that sections of the main can be isolated for repairs.

D-17: Transmission Main Replacement – This project will replace distribution main sections that have high rates of leakage to reduce overall DSL.

9.2.2 Water Maintenance and Operations

M-1: Water System Plan Update – DOH requires periodic updates to the City's water system plan.

M-2: WTP Hypochlorination System – The chlorine gas-based disinfection system at the Water Treatment Plant will be replaced by a sodium hypochlorite-based system including on-site generation and storage of hypochlorite.

M-3: Fairview Reservoir Floating Cover Replacement – The existing floating covers installed in 2002 will be replaced. The existing liners will be replaced as the remaining life of the existing liners is significantly less than the expected lifespan of the new covers, and the covers, once constructed, cannot be removed to replace the liners.

M-4: WTP New Membranes – The membranes on the filters at the Water Treatment Plant require replacement approximately every five years.

M-5: Malinowski Reservoir Siltation Mitigation – This project will restore volume within the reservoir behind Malinowski Dam which is the source of Aberdeen's potable water. Siltation in the reservoir has reduced its operating volume which impacts operations during peak summer low flows on the Wishkah River.

M-6: Watershed Forestry Management – Expenses associated with forest management within the watershed, including road maintenance, culvert replacement, executing timber sales, reforestation, and thinning.

M-7: Re-Coating South Aberdeen Tank – The City's South Aberdeen tank will require re-coating and this project budgets for this expense.

M-8: Tank Inspection – This item budgets for inspection by divers of the City's reservoirs and tanks.

M-9: Wishkah Headworks Security and Communications Improvements – This item budgets for the installation of surveillance cameras, a satellite modem connection, and an improved communication system.

M-10: Water System Plan Update – DOH requires periodic updates to the City's water system plan.

M-11: DSL Reduction Strategies – The City identified several options for reducing DSL as part of its water loss control action plan including calibration of mag meters at the Fairview Reservoirs, hire a leak detection company to survey the distribution system, replace larger older meters, and purchasing leak detection equipment compatible with the City's AMI. This line item indicates the City will investigate feasibility of taking these actions in the future to reduce DSL.

10. Financial Plan

10.1 Introduction

The effective implementation of a Water System Plan (WSP) is dependent upon developing a document that can be financially supported by the utility; will meet State and local regulatory requirements; and provides the flexibility to deal with unforeseen changes.

This section presents a financial plan that reviews the sources of funds (revenues) and applications of funds (expenses) for the City of Aberdeen's (City) water system. The financial plan includes projected operating and capital costs of the system for the ten-year time horizon of 2020-2029. The revenues and expenses used in the financial plan were obtained from the City's 2020 budget in conjunction with historical consumption information. The capital costs contained within the financial plan utilize the Capital Improvement Plan (CIP) presented in Section 9. The results of the financial plan outline the annual operating and capital needs of the water system and determine if the current water revenues are sufficient to cover costs. This analysis is not sufficient to provide a detailed review of cost of service or rate adjustment requirements. However, the City may consider performing a rate review independent of this planning document to address those issues.

10.2 Past Financial History

Financial information for the water utility were evaluated to gain an understanding of the past performance of the utility, and at the same time, gain perspective of the current financial status of the water utility.

Table 10-1 is a summary of a three-year financial history (2017-2019) for the City's water utility, plus details of the 2020 budget year. A more detailed breakdown is provided in the water utility outlook generated by the City's rate study which is available as Appendix N.

Table 10-1. Water System Financial History (in thousands of dollars)

Year	2020 Budget	2019 Actual	2018 Actual	2017 Actual
Rate Revenues	3,282	3,288	3,323	3,316
Other Revenues	1,634	2,085	369	392
Transfer in from Reserve	387	0	0	0
Total Revenues	5,303	5,373	3,692	3,708
O & M Expenses	3,929	3,702	3,371	3,210
Transfer to Reserve	0	750	0	0
Debt Service	0	0	382	386
Capital Purchase/Improvements	2,122	86	72	62
Total Expenses	6,051	4,538	3,824	3,657
Balance (Deficiency)	(747)	835	(132)	51

For revenues, Table 10-1 illustrates steady rate revenues due to unchanging utility rates during the period and fairly static population and user base. A utility rate study completed in 2020 resulted in the passage of a five-year stepped rate increase, with the majority of rate payers not seeing an increase until 2021. Other revenues are subject to less year-to-year consistency as the Water Utility has periodic revenue from borrowing. The water department owns approximately 1,545 acres of managed timberland which also generates revenue for the utility. Revenue from timber sales is typically put into reserves and is then transferred in as needed to fund capital expenditures.

Concerning expenses, Table 10-1 illustrates steadily rising O&M expenses and a large increase in capital and improvements in budget year 2020. This correlates with annual cost escalation and with implementation of major capital improvements and planning getting underway in 2020. A utility rate study completed in 2020 resulted in the development of a new ten-year CIP with the initial work beginning in 2020. The 2020 budget year also included capital improvements that are being deferred to 2021.

10.3 Development of the Financial Plan

The development of the ten-year financial plan is intended to demonstrate the City's ability to meet its capital improvement and operating needs, while maintaining sufficient rate levels to support those needs. The City also has reserve fund balance goals, which were factored into the development of this financial plan. The financial plan was developed to review the projected revenues and expenses of the water system for 2020-2029.

The City's 2020 budget was used as the basis for the anticipated revenues and expenses of the system. Projections for future year revenues were developed by considering the City's low projected growth and transfers from reserves. Operating expenses were projected by applying an annual escalation factor dependent upon the type of expense being reviewed. Operation and maintenance (O&M) expenses and miscellaneous other revenues are inflated by 3.0 percent per year.

10.3.1 Sources of Funds

The first component of the financial plan is a review of the sources of funds of the water system. The different revenues received from operations are:

- Rate revenues – water sales to customers
- Other revenues – service repairs, fines and penalties, ancillary fees, and interest earnings
- Transfer from the reserve fund (Timber sales).

Rate Revenues

Rate revenues are projected to rise from \$4.0 million in 2020 to \$5.7 million in 2024 due to five years of stepped rate increases approved by ordinance. The rate revenues of the City come from retail sales from its residential and commercial customers as well as wholesale contracts with the City of Cosmopolis and Stafford Creek Corrections Center. The City's retail customers include both in-City residential and commercial customers as well as customers outside of the City Limits in an area referred to as Wishkah. After the last stepped rate increase goes into effect in 2024, each year beyond

will be subject to an annual adjustment based on the change in the Consumer Price Index. Rate revenue growth due to other factors is not anticipated due to low growth rate and decreasing consumption patterns.

Other Revenues

Currently other revenues from miscellaneous sources such as late fees are estimated to remain flat and insignificant at approximately \$7,000 per year.

Transfers

The City water department owns approximately 1,545 acres of managed timberlands. A forest management plan was created in 2018 to help establish harvest areas and rates to maximize timber sale revenue while responsibly managing the forest. The exact timing of timber sales may be subject to market conditions and planned capital expenditures. It is estimated that revenue from timber sales can provide a sustained average annual revenue source of \$500,000 over the next 10 years. Money from timber sales are typically placed in the water reserve fund and then transferred to the operating fund to fund capital improvements or mitigate the need for rate increases to fund operating costs.

There is a projected balance in the reserve fund at the end of 2020 of \$2.0 million. The City plans to utilize reserve funds to balance cash spending from the operating fund and borrowing for capital improvements from 2020 to 2025 with the estimated year-end balance of the reserve fund varying between \$1.1 million and \$2.7 million during this time.

10.3.2 Application of Funds

The second part of the financial plan is a review of the application of funds. In developing the financial forecast, four main cost components were reviewed:

- O&M Expenses
- Taxes/Transfer Payments
- Debt Service
- Capital Improvement Projects Funded from Rates

Operation and Maintenance Expenses

The 2020 budget was used as a starting point of developing O&M expenses. O&M expenses were categorized into ten major subcategories. They are:

- Administration
- Planning/Research/Development
- Depreciation Expense
- Training
- Customer Service
- Filtration O&M
- Source of Supply-Wishkah

- Pumping
- Reservoir/Treatment/Storage
- Transmission/Distribution.

An annual escalation factor of 3.0% was applied to the 2020 budget costs to obtain projected costs.

Taxes/Transfer Payments

The water system currently only has a tax obligation to the State in the form of the State excise tax. Excise tax is calculated as 5.029 percent of the water utility rate revenues. The water system also makes a payment in lieu of taxes to the City general fund. For 2019 these taxes/transfer payments totaled \$313,791. They are anticipated to increase to approximately \$315,000 in 2020 and \$346,500 in 2021. It should be noted that the projected taxes for the period assume constant tax rates over time.

Debt Service

The City of Aberdeen Water Utility currently has no debts to service. The City performed a utility rate study completed in 2020 that balanced rate revenue, borrowing, and use of reserves to fund the ten years of capital improvements listed in this plan from years 2020-2029. The only borrowing the plan indicates is \$3.2 million for the replacement of reservoir covers and liners in 2021. Other significant capital costs are anticipated to be covered by rate revenue and transfers from reserve.

Capital Improvement Projects from Rates

Capital improvement projects are related to the infrastructure of a utility. Capital improvement projects are generally divided into two categories: capital improvements related to renewal of existing plant and replacement of existing and depreciated facilities, including system expansion, system upgrades, and new customers.

A utility rate study was completed in 2020 and a ten-year CIP for years 2020-2029 developed. This financial plan has incorporated the capital projects outlined in the City's CIP presented in Chapter 9. The Aberdeen City Council passed an ordinance setting stepped increases to water utility rates to generate revenue needed for the CIP, with residential base rates increasing from \$26.78 in 2020 to \$38.78 in 2024, then annual adjustments afterward based on the Consumer Price Index. The rate study proposes a balance of rate revenue, borrowing, and use of reserves to fund the six years of capital improvements.

The outlook from the utility rate study is included as Appendix N.

If the City later determines that capital improvement projects other than those listed in the CIP are required and the reserve fund accumulations are not capable of satisfying the additional projects, the City may need to consider finding other funding sources such as new debt, or increase its water rates.

External Sources of Funds for Capital Projects

The City has the ability to apply for grant and loan funds available to public entities for water system projects. Table 10-2 provides a summary of the contacts for various funding agencies. It is important to note that these sources rarely provide full funding of a construction project. The City would need to

supplement these funds with other funding sources to ensure that implementation of the recommended capital improvement projects occurs.

Table 10-2. Funding Agency Contacts

Program	Address	Phone	Fax	Internet
Centennial Clean Water Fund	Department of Ecology P.O. Box 47600 Olympia, WA 98504-7600	(360)407-6566	(360) 407-6426	www.ecy.wa.gov
Drinking Water State Revolving Fund	Department of Health DWSRF PO Box 47822 Olympia, WA 98504-7822	(360)236-3095	(360) 236-2253	www.doh.wa.gov
Public Works Trust Fund	Public Works Board P.O. Box 48319 Olympia, WA 98504-8319	(360)586-7186	(360) 664-3029	www.pwb.wa.gov
USDA Rural Development	Rural Utilities Service USDA, Rural Development 1835 Black Lake Blvd. Suite C Olympia, WA 98512-5716	(360)704-7764	(360) 704-7775	www.rurdev.usda.gov
Infrastructure Database (over 200 funding programs)	Infrastructure Assistance Coordinating Council (IACC)	(360)725-5002		www.infrafunding.wa.gov

Centennial Clean Water Fund (CCWF)

The Centennial Clean Water Fund (CCWF) is available to local governments and tribes for measures to prevent and control water pollution. Both grants and loans are available on a yearly funding cycle.

CCWF is the largest State Grant Program. It provides grants for planning, design, and construction of facilities and other activities related to water quality. The primary focus of the program is pollution prevention and funding projects with a quantifiable water quality benefit. The program allows for some projects which address water quantity issues if they will improve water quality as well. However, funding cannot be used solely to provide a source of supply. Funds are available to protect a source of water supply, as well as funding of water conservation or water reuse projects, if they can be shown to be the cost-effective alternative to solve a water quality problem.

Another source of Washington Department of Ecology (Ecology) grant funding provided by the Remedial Action grant program is normally used only to mitigate contamination events.

Drinking Water State Revolving Fund (DWSRF)

The Washington Department of Health (DOH) manages these funds. Each state receives annual allocations from the federal government. In Washington State, the DWSRF is jointly managed by the Department of Health (DOH) Division of Drinking Water and the Public Works

Trust Fund Board (Board), along with its partner, the Department of Community, Trade and Economic Development.

DWSRF loans are available to all community public water systems. The loans may be used to address SDWA health standard violations, replace infrastructure for SDWA compliance, or consolidate supplies and acquire property if needed for SDWA compliance.

The terms of the loan are generally one percent less on interest than municipal utility revenue bonds, and life of the loan can extend for the life of the facility up to a 20-year maximum. A ten percent local match is required on all projects. In addition, eligible systems must demonstrate “adequate operational, technical, and financial capability to maintain compliance,” have an approved water system plan (WSP) to ensure the applicant project is included in the WSP Capital Improvement Program, and meet other eligibility criteria.

Public Works Trust Fund

The Public Works Trust Fund (PWTF) loan program is a loan program set up by the Legislature to assist cities, towns, counties, and special districts with funding for different types of public works projects. The projects can include streets, roads, drainage systems, water systems, and sanitary sewer systems. The emphasis of allocating funds for is based on replacement and/or repair of existing systems. No funds are allocated to install a new system. Rather, funds are granted to rehabilitate or replace an existing system serving an existing population.

U.S. Department of Agriculture, Rural Development

Loan monies are available through RD for the preliminary engineering, design, construction, and start-up of new water system facility projects. The application process allows for a thorough review of the engineering, environmental, and financial impacts of proposed projects before extending a loan offer. The RD loan program offers interest rates lower than municipal bonds and up to a 40-year term. The RD loan program requires some form of interim financing, as loan monies are made available after completion of the construction activity.

Infrastructure Assistance Coordinating Council

One key resource in identifying other funding programs is the Infrastructure Assistance Coordinating Council (Council). The Council is comprised of state and local organizations whose function is to provide funding for infrastructure repair and development. The purpose of the Council is to assist local governments in coordinating funding efforts for infrastructure improvements. This is an important resource as the Council will be aware of any new funding opportunities that may arise

While the above list of possible grant and loan opportunities for the City is not exhaustive, it does highlight the most probable outside funding sources, excluding revenue bonds, available to the City for its capital improvement needs.

Other outside funding sources available to offset capital costs include contributions received from new water connections, existing reserves and new revenue bond proceeds.

10.3.3 Internal Sources of Funds

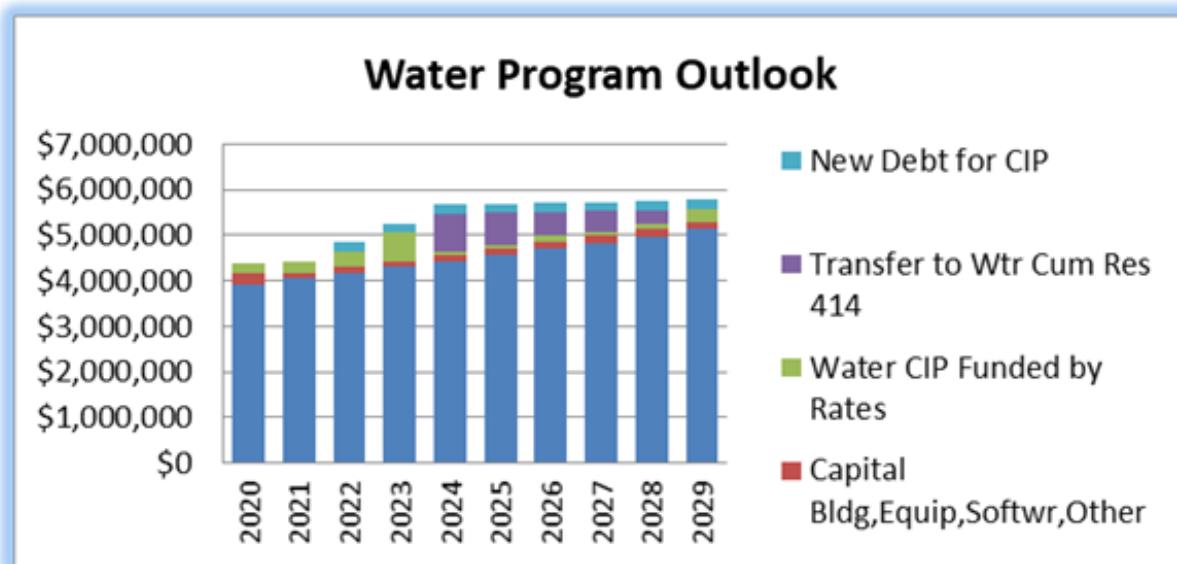
The previous section discussed external sources of funds. The City has the ability to internally generate funds other than those it currently anticipates in its financial plan. The City's current capital planning does not include any monies from contributions or grants. No allowances have been made for funding from interest earnings on capital reserve funds, connection charges, or rate surcharges. These are options available to the City for offsetting some of the funding requirements of their capital plan.

10.4 Summary of the Financial Projections

The City completed a utility rate study in 2020 to establish utility rates to provide sufficient revenue for the ten-year CIP. The plan includes a balance of rate revenue, borrowing, and transfers from reserves (including timber sales) to promote the financial well-being of the water utility. The water utility outlook from the study is included as Appendix N. A summary is provided below in Table 10-3.

Table 10-3. Summary of the City's Ten-Year Financial Plan (\$000)

Water Utility Fund 404 Financial Outlook	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
GROWTH SCENARIO										
Growth - New Homes per year	0									
Water Sales (existing rates)	3,648,152	4,056,800	4,465,500	4,874,200	5,282,900	5,282,900	5,282,900	5,282,900	5,282,900	5,282,900
Projected Other W Revenue	745,236	368,550	379,450	390,650	402,150	414,050	426,250	438,850	451,850	465,250
Projected W Expenditures	4,393,388	4,425,350	4,844,950	5,264,850	5,674,700	5,689,200	5,709,150	5,721,750	5,734,750	5,782,000
Increase/(use) of Reserves	-	-	-	-	10,350	7,750	-	-	-	33,850
Estimated Residential Base Rate	\$26.78	\$29.78	\$32.78	\$35.78	\$38.78	\$38.78	\$38.78	\$38.78	\$38.78	\$38.78
Estimated Monthly Increase	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Estimated Percentage Change	0%									



As can be seen from Table 10-3, the City identified that significant rate increases were required to fund capital improvements, pay for O&M costs, and maintain the financial health and stability of the water utility. The Aberdeen City Council approved five years of stepped rate increases to occur from 2020 to 2024 with annual adjustments for CPI to be performed for later years. These rates are codified in Aberdeen Municipal Code Chapter 13.60.

10.5 Extended Financial Plan 2030-2039

The City's utility rate study identified six years of capital improvements totaling \$10.1 million and developed a plan to generate the revenue to construct the improvements and service related debt. The Aberdeen City Council approved the five years of stepped utility rate increases necessary to implement the plan. Beyond 2025, this Water System Plan has identified \$9.7 million in capital improvements for the 14 years from 2026-2039. The utility rate revenue generated from year 2026 into the future far exceeds the capital costs planned during that time period. Excess revenue will be put into reserve or will be budgeted as-needed for unanticipated and emerging future capital improvements.

10.6 Review of the Water Rates

Water utility rates are established in Aberdeen Municipal Code Chapter 13.60 – Water Rates and Charges. Table 10-4 shows the water rates for the City. These rates have been set based on the results of a utility rate study completed in 2020 and are being implemented in conjunction with planned capital improvements as outlined in Chapter 9 of this Water System Plan.

Table 10-4. Monthly Water Rate

Adopted Water Rates, Ord. No. 6655, Nov. 2019	2020	2021	2022	2023	2024
Fixed-rate minimum - in hundred cubic feet	Monthly Rate				
Single-Family/Duplex residential - 0 - 3.99	\$26.78	\$29.78	\$32.78	\$35.78	\$38.78
Low-Income Senior (age & income-qualified)	\$21.42	\$23.82	\$26.22	\$28.62	\$31.02
Commercial (for 5/8 & 3/4 inch meters) - 0 - 3.99	\$28.09	\$31.23	\$34.38	\$37.52	\$40.67
Consumption in hundred cubic feet	Additional charge per hundred cubic feet				
4.00 - 12.99	\$1.89	\$1.97	\$2.04	\$2.13	\$2.21
4.00 - 12.99 (commercial only)	\$3.78	\$3.93	\$4.09	\$4.25	\$4.42
13.00 - 30.99	\$3.78	\$3.93	\$4.09	\$4.25	\$4.42
31.00 - 60.99	\$3.78	\$3.93	\$4.09	\$4.25	\$4.42
61.00 - up	\$2.57	\$3.00	\$3.50	\$4.00	\$4.42

The rates established above are codified to automatically increase each year, beginning the January 1, 2025, based on the change in Consumer Price Index (CPI) for the greater Seattle area for the 12-month period of July 1st to June 30th immediately preceding the date of the

increase provided that the annual CPI adjustment shall not be less than zero percent and shall not exceed five percent.

Aberdeen's water utility rate structure encourages conservation and allows customers to lower their bills by conserving. There is a single base rate that includes up to 3.99 ccf, then any additional water us paid for as used. To encourage conservation and reduce pressure on base rates, the higher volume tiers will be adjusted between 2020 and 2024 so that those that use more will pay more.

While these water rates are set to incrementally increase over five years to mitigate the impact of higher rates on ratepayers, the City is concerned about the impact of rates on senior low income residents. For age and income qualified residents, a 20% discount on water monthly base rates year-round is available as outlined in Aberdeen Municipal Code Chapter 12.64 – Low-Income Senior Citizens—Rate Remission.

10.7 Summary

The financial plan results presented in this section indicate that water rates have been established through a utility rate study to generate sufficient revenue to fund the water utility including planned capital improvements. The City has developed a ten-year CIP that is correlated with established utility rates, planned borrowing, and the use of reserve funds including reserve funds generated by timber sales. The City has been proactive in its financial management in the past and is continuing with this management style to enable the City to operate on a financially sound basis.

Appendix A

Water Facilities Inventory



WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 1
Updated: 01/09/2020

Printed: 9/28/2020

WFI Printed For: On-Demand

Submission Reason: No Change

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

1. SYSTEM ID NO. 00050 9	2. SYSTEM NAME ABERDEEN CITY OF	3. COUNTY GRAYS HARBOR	4. GROUP A	5. TYPE Comm								
6. PRIMARY CONTACT NAME & MAILING ADDRESS MIKE RANDICH [MANAGER] CITY OF ABERDEEN WATER DEPT 200 E MARKET ST ABERDEEN, WA 98520		7. OWNER NAME & MAILING ADDRESS ABERDEEN, CITY OF MIKE RANDICH 200 E MARKET ST ABERDEEN, WA 98520 MANAGER										
STREET ADDRESS IF DIFFERENT FROM ABOVE ATTN ADDRESS CITY STATE ZIP		STREET ADDRESS IF DIFFERENT FROM ABOVE ATTN ADDRESS CITY STATE ZIP										
9. 24 HOUR PRIMARY CONTACT INFORMATION Primary Contact Daytime Phone: (360) 537-3273 Primary Contact Mobile/Cell Phone: (360) 580-3149 Primary Contact Evening Phone: (xxx)-xxx-xxxx Fax: (360) 533-2959 E-mail:xxxxxxxxxxxxxxxxxxxx		10. OWNER CONTACT INFORMATION Owner Daytime Phone: (360) 537-3223 Owner Mobile/Cell Phone: (360) 580-3149 Owner Evening Phone: (xxx)-xxx-xxxx Fax: (360) 533-2959 E-mail:xxxxxxxxxxxxxxxxxxxx										
11. SATELLITE MANAGEMENT AGENCY - SMA (check only one) <input checked="" type="checkbox"/> Not applicable (Skip to #12) <input type="checkbox"/> Owned and Managed <input type="checkbox"/> Managed Only <input type="checkbox"/> Owned Only SMA NAME: _____ SMA Number: _____												
12. WATER SYSTEM CHARACTERISTICS (mark all that apply) <input checked="" type="checkbox"/> Agricultural <input checked="" type="checkbox"/> Commercial / Business <input checked="" type="checkbox"/> Day Care <input checked="" type="checkbox"/> Food Service/Food Permit <input type="checkbox"/> 1,000 or more person event for 2 or more days per year <input checked="" type="checkbox"/> Hospital/Clinic <input checked="" type="checkbox"/> Industrial <input checked="" type="checkbox"/> Licensed Residential Facility <input checked="" type="checkbox"/> Lodging <input type="checkbox"/> Recreational / RV Park <input checked="" type="checkbox"/> Residential <input checked="" type="checkbox"/> School <input type="checkbox"/> Temporary Farm Worker <input checked="" type="checkbox"/> Other (church, fire station, etc.): _____												
13. WATER SYSTEM OWNERSHIP (mark only one)			14. STORAGE CAPACITY (gallons) <input type="checkbox"/> Association <input type="checkbox"/> County <input type="checkbox"/> Investor <input type="checkbox"/> Special District <input checked="" type="checkbox"/> City / Town <input type="checkbox"/> Federal <input type="checkbox"/> Private <input type="checkbox"/> State 26,300,000									
15	16 SOURCE NAME LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	17 INTERTIE SYSTEM ID NUMBER	18 SOURCE CATEGORY WELL WELL FIELD SPRING SPRING IN SPRINGFIELD SEA WATER SURFACE WATER RANNEY / INF. GALLERY	19 USE PERMANENT OTHER SEASONAL	20 SOURCE METERED EMERGENCY	21 IRRADIATION (UV) FLUORIDATION FILTRATION CHLORINATION	22 DEPTH DEPTH TO FIRST OPEN TERVAL IN FEET	23 CAPACITY (GALLONS PER MINUTE)	24 SECTION NUMBER 1/4, 1/4 SECTION	TOWNSHIP	RANGE	
Source Number												
S01	Wishkah River		WELL		X	X	Y	X X X	X	4500	SE SW	34 21N 08W
S02	Hoquiam /34350 Aberdeen Ave (2 Way)	34350 1					X Y X			625	NE SW	04 18N 10W
S03	Hoquiam /34350 Port Dock (2 Way)	34350 1					X Y X			900	NE SE	04 18N 10W

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE									
00050 9	ABERDEEN CITY OF	GRAYS HARBOR	A	Comm									
			ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS									
			DOH USE ONLY! APPROVED CONNECTIONS	Unspecified									
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)			6625										
A. Full Time Single Family Residences (Occupied 180 days or more per year)			4929										
B. Part Time Single Family Residences (Occupied less than 180 days per year)			0										
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)													
A. Apartment Buildings, condos, duplexes, barracks, dorms			360										
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year			1696										
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year			0										
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)													
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)			0	0									
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.			725	725									
28. TOTAL SERVICE CONNECTIONS			7350										
29. FULL-TIME RESIDENTIAL POPULATION													
A. How many residents are served by this system 180 or more days per year? <u>16760</u>													
30. PART-TIME RESIDENTIAL POPULATION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?													
B. How many days per month are they present?													
31. TEMPORARY & TRANSIENT USERS		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?		17000	17000	17000	17000	17000	17000	17500	17500	17500	17000	17000	17000
B. How many days per month is water accessible to the public?		30	30	30	30	30	30	30	30	30	30	30	30
32. REGULAR NON-RESIDENTIAL USERS		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?		615	615	615	615	615	354	354	354	615	615	615	615
B. How many days per month are they present?		20	20	20	20	20	20	20	20	20	20	20	20
33. ROUTINE COLIFORM SCHEDULE		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
		20	20	20	20	20	20	20	20	20	20	20	20
34. NITRATE SCHEDULE		QUARTERLY				ANNUALLY				ONCE EVERY 3 YEARS			
(One Sample per source by time period)													
35. Reason for Submitting WFI:													
<input type="checkbox"/> Update - Change <input type="checkbox"/> Update - No Change <input type="checkbox"/> Inactivate <input type="checkbox"/> Re-Activate <input type="checkbox"/> Name Change <input type="checkbox"/> New System <input type="checkbox"/> Other _____													
36. I certify that the information stated on this WFI form is correct to the best of my knowledge.													
SIGNATURE: _____							DATE: _____						
PRINT NAME: _____							TITLE: _____						

WS ID WS Name
00050 ABERDEEN CITY OF

Total WFI Printed: 1



Water Facilities Inventory (WFI)

Report Create Date: 9/28/2020

Water System Id(s): 000509

Print Data on Distribution Page: ALL

Print Copies For: DOH Copy

Water System Name: ALL

County: -- Any --

Region: ALL

Group: ALL

Type: ALL

Permit Renewal Quarter: ALL

Water System Is New: ALL

Water System Status: ALL

Water Status Date From: ALL To ALL

Water System Update Date ALL To ALL

Owner Number: ALL

SMA Number: ALL

SMA Name: ALL

Active Connection Count From: ALL To: ALL

Approved Connection Count ALL To: ALL

Full-Time Population From: ALL To: ALL

Water System Expanding ALL

Source Type: ALL

Source Use: ALL

WFI Printed For: On-Demand

Appendix B
Municipal Code Chapters 12.56 and 13.60 and Cosi
Contract

Chapter 13.56

WATER SYSTEM REGULATIONS

Sections:

- 13.56.010 Definitions.**
- 13.56.020 Application for service.**
- 13.56.030 Application—Contract provisions.**
- 13.56.040 Effective date of contract.**
- 13.56.050 Connection with main—Premises abutting upon a street.**
- 13.56.060 Connection with main—Premises not abutting upon a street.**
- 13.56.070 Connection with main—Arrangement of service pipe.**
- 13.56.090 Service pipes—Specifications—Maintenance.**
- 13.56.100 Extension of water mains within the city limits.**
- 13.56.110 Extension of water mains outside the city limits.**
- 13.56.130 Public expenditures.**
- 13.56.140 Fees and charges for service - Installation fee required.**
- 13.56.142 System development charges.**
- 13.56.144 Fire flow - Connections restricted.**
- 13.56.150 Private service pipes—New and existing services.**
- 13.56.160 Change in size or location of pipe—Renewal of abandoned service.**
- 13.56.170 Laying of new main—Application for tap.**
- 13.56.180 Failing to comply with Section 13.56.170.**
- 13.56.190 Activation of service—Account set-up charge.**
- 13.56.200 Disconnection of service—Reconnection—Service fee.**
- 13.56.210 Unauthorized turn-on/shutoff at main or removal.**
- 13.56.230 Liability for rates and charges—Lien against premises—Refusal of service.**
- 13.56.240 Water for new construction and remodeling.**
- 13.56.260 Disconnection of service to condemned premises.**
- 13.56.290 Emergency water use restrictions.**
- 13.56.310 Irrigation and use of water hoses.**
- 13.56.340 Right of city to shut off water—Nonliability for damage.**
- 13.56.350 Responsibility for damages resulting from leaks on private premises - right to shut off service or make repairs.**
- 13.56.360 Leaks under a street—Excavation by water department—Repair of leak.**
- 13.56.370 Wasting of water unlawful.**
- 13.56.390 Fire protection services.**

- 13.56.400 Tapping of fire service pipe—Penalty.**
- 13.56.410 Inspection of premises supplied with water from city's mains.**
- 13.56.430 Meters—Property of city—Damaging.**
- 13.56.450 Failure to receive charges in mail.**
- 13.56.470 Enforcement of chapter - assistance from other departments.**
- 13.56.480 Unlawful to obstruct access to or injure fire hydrants.**
- 13.56.490 Unlawful to tamper with fire hydrant, or valves belonging to city - emergence use auxiliary water supply restricted.**
- 13.56.500 Unlawful to damage water department property.**
- 13.56.510 Unlawful to pollute city water supply.**
- 13.56.515 Addition of fluoride—Administration.**
- 13.56.520 Unlawful to connect with main or city water pipe without permission.**
- 13.56.530 Remission of rates—Generally.**
- 13.56.540 Payment of water service charges—Delinquencies - shut off notices.**
- 13.56.550 Delinquent payments - Hearings - Adjustments and security deposits.**
- 13.56.560 Utility service request notices - Prorated charges - Approved forms required.**
- 13.56.570 Utility service request notices - vacant premises - occupied premises - security deposits.**
- 13.56.580 Questions not covered by chapter.**
- 13.56.600 Violation—Penalty.**
- 13.56.610 Chapter part of contract—Suspension of action where injustice.**
- 13.56.620 Cross-connection Control Program.**

13.56.010 Definitions.

In construing the provisions of this chapter, except when otherwise declared or clearly apparent from the context, the following definitions and interpretations shall apply:

- A. “Equivalent residential unit (ERU)” as used in this chapter means the equivalent of one residential water service of 5/8” or 3/4” diameter, providing water service to a single family residence. One ERU is equal to two hundred six (206) gallons per day, at a nominal flow rate of not more than twenty (20.0) gallons per minute with a residual line pressure not less than that required by current Washington State standards, and a peak day demand of five hundred fifteen (515) gallons per day.
- B. “Fire flow” as used in this chapter means the flow rate of the water supply, measured in gallons per minute, required by the local fire authority to be available for firefighting at the point of service pursuant to the Uniform Fire Code as adopted by the city. “Fire flow duration” is the period of time that the fire flow is required to be available at the point of service.

C. "Person" as used in this chapter means natural persons, any individual receiver, partnership, firm, assignee, trustee in bankruptcy, company, joint-stock company, business trust, corporation, association, society, or any group of individuals acting as a unit, whether mutual, cooperative, fraternal, nonprofit or otherwise, and governmental units or agencies, including the United States or any instrumentality thereof.

D. "Superintendent" or "director" as used in this chapter means the Public Works Director, or any other employee authorized to act on behalf of the director.

E. *Grammatical Interpretation.* Words in the singular number shall include the plural, and the plural shall include the singular. Words in one gender shall include all other genders. Words in the present tense shall include the past and future tenses and vice versa. Words and phrases used in this chapter and not specifically defined shall be construed according to the context and approved usage of the language.

(Ord. 6497, Amended, 03/24/2010; Ord. 6149, Amended, 02/12/1997. Prior code § 10.18.010)

13.56.020 Application for service.

A property owner desiring to connect with the domestic water supply of the city of Aberdeen shall present at the office of the water department a completed application for a service connection on a standard form to be furnished for that purpose together with the fees for installation of water service as provided in this chapter.

(Ord. 6497, Amended, 03/24/2010)

13.56.030 Application—Contract provisions.

The standard application form required in AMC [13.56.020](#) shall contain a contract on the part of the person making the same to pay for the water applied for at the rate and in the manner specified in this chapter, and shall reserve to the city of Aberdeen the right to temporarily discontinue the service at any time without notice to the consumer and shall specify that said contract is subject to all the provisions of this chapter and of any ordinance of the city of Aberdeen relating to the domestic water system hereafter passed and shall provide that in case the supply of water is interrupted or fails by reason of accident or any other cause whatsoever, the city shall not be liable for damages for such interruption or failure, nor shall such failure or interruption for any reasonable period of time be held to constitute a breach of contract on the part of the city or in any way relieve the consumer from performing the obligations of his contract.

(Ord. 6497, Amended, 03/24/2010)

13.56.040 Effective date of contract.

All contracts shall take effect from the day they are signed and rates shall be charged from the day the premises are connected with the city's water supply and the water is turned on.

(Prior code § 10.18.040)

13.56.050 Connection with main—Premises abutting upon a street.

Upon the presentation at the office of the superintendent of the treasurer's receipt for the installation fees and execution of the contract hereinbefore provided for, premises abutting a street with a city water main installed shall be connected with the city's water main by service pipe extending at right angles from the main to within ten (10) feet of the property line, which connection shall thereafter be maintained by and kept within the exclusive control of the city. All service pipe and connections from the city's meter shall be installed and maintained by the owner or agent of the property served. Any leak or waste of water on the property owner's side of the meter will be charged for at the rate provided for in this chapter, and the owner of services is responsible for all leaks or damages on account of leaks from the service pipes leading from the city's meter to the premises served.

(Ord. 6497, Amended, 03/24/2010)

13.56.060 Connection with main—Premises not abutting upon a street.

Water service connections for premises not abutting a street in which there is a city water main shall be made by tapping the water main at the point nearest to the premises and extending the service pipe at right angles from the main to within ten (10) feet of the property line of the premises to be served and setting the meter. The city may, upon the payment of the actual cost thereof, extend the service to the premises of the applicant along and beneath any public street, but in no case shall such extension exceed one hundred feet in length. All service pipes and connections from the meter to the premises shall be installed and maintained by the owner or agent of the property served.

(Ord. 6497, Amended, 03/24/2010)

13.56.070 Connection with main—Arrangement of service pipe.

The service pipe must be so arranged that the supply to each separate house or premises may be controlled by a separate meter, and one person must pay for all the water used through said service for his or her own use, or for the use of others to whom it may be accessible.

(Ord. 6497, Amended, 03/24/2010)

13.56.090 Service pipes—Specifications—Maintenance.

All persons connecting to a city meter or laying their own private pipe shall be required to use only the pipe recognized and prescribed by the plumbing code adopted by the city of Aberdeen and all the pipes shall be laid not less than eighteen (18) inches below the surface of the ground; except, that in ungraded streets, where the

grade is already established, said services and pipes shall be laid at least eighteen (18) inches below said established grade. The superintendent will maintain private service from city mains in streets which are being graded or regraded and will have such access on private property as shall be necessary to maintain such pipes during the work, and shall as soon as practicable upon the completion of such work, relay said pipes in street. Owners shall maintain their private pipes from the city meter to and into their property.

(Ord. 6497, Amended, 03/24/2010)

13.56.100 Extension of water mains within the city limits.

When an applicant requests water service to property lying within the city limits but with no main in the adjacent street, a main, as approved by the current edition of the "Standard Specifications for Municipal Public Works Construction" as adopted by the city of Aberdeen, may be installed. Such installation shall be as follows:

A. Installation in city right-of-way.

1. The owner or owners of the property to be served shall bear the expense of the main extension. If the main extension is to be installed on city right-of-way, the city of Aberdeen shall have the option of performing the main extension with city crews or under contract let by the city. The superintendent of the water department shall estimate the expense of labor, equipment, materials and overhead and the estimated cost shall be paid to the city treasurer prior to the main installation. The estimate shall include the service connection fee in AMC [13.56.140](#). If the estimated amount, including the service connection fee, does not cover the cost of the installation, the deficit shall be charged to the property for which the installation was made and shall be paid to the city treasurer within sixty (60) days after the determination of the deficit. If the estimated amount is in excess of the actual cost of the installation, any amount in excess of the service connection fee shall be returned to the owner or owners paying for the main extension.
2. The superintendent of the water department is authorized to contract with the owner or owners of the property to be served to provide a means for recovering a portion of the cost of the main extension by means of a late-comer charge to abutting property owners who did not share in the costs of installation but who wish to connect into the service within ten years following installation of the water main. Any work contract shall be recorded in the office of the Grays Harbor County Auditor.

B. Installation on private property.

1. Any portion of a proposed main extension which is located on privately owned property may be installed to city specifications by a competent contractor at the expense of the owner. The owner shall reimburse the city for the cost of an inspector from the water department performing main installation inspections as deemed necessary by the superintendent.
2. For any main constructed on private property, the city shall have the option of requiring that an easement for access to the water main extension be obtained prior to such construction. Said easement shall be a minimum of five feet each way from the centerline of the pipe. The grantor shall not construct any buildings

or structures within the easement without first having obtained the approval of the superintendent of the water department.

C. *Local Improvement Districts.* The owners of property who desire an extension of the city water main may choose to have the main installed by the formation of a local improvement district ("L.I.D.") as prescribed by law.

D. Ownership of improvements - city may oversize main extensions.

1. The city shall own and maintain all water main extensions located upon city property or right-of-way.

2. If the city's water distribution needs are best served by a main sized larger than the main required of the developer, the city shall pay the difference between the cost of the standard pipe and that of the required pipe size.

(Ord. 6497, Amended, 03/24/2010)

13.56.110 Extension of water mains outside the city limits.

A. The superintendent of the water department may approve a request to extend the water main beyond the city limits; provided, that the supply to the proposed area is adequate to satisfy the anticipated demand without adversely affecting the supply to those customers tapped into the existing main. Any such proposal to extend the water main outside the city limits on a permanent basis shall be submitted to the boundary review board as provided in RCW [36.93.090](#).

B. Main extensions must conform to the "Standard Specifications for Municipal Public Works Construction" as adopted by the city of Aberdeen. The superintendent may require that a plan and profile of the proposed main extension be prepared by a licensed engineer.

C. The city shall have the option of installing said main extension with city personnel and charging the applicant for the expense of labor, equipment, materials and overhead, contracting for the installation with the payment for the installation to be made or reimbursed by the applicant, or permitting the applicant to have the main extended, pursuant to approved plans, by a competent contractor at the applicant's expense. If the extension is installed by a contractor, the applicant shall reimburse the city for the cost of an inspector from the water department performing such main installation inspections as deemed necessary by the superintendent.

D. The superintendent of the water department is authorized to contract with the applicant or others bearing the cost of a main extension to provide for a means of recovering a portion of the costs of the main extension by means of a late-comer charge to abutting property owners who did not share in the costs of installation but who wish to connect into the service within ten years following installation of the water main. Any such contract shall be recorded in the office of the Grays Harbor County Auditor.

(Ord. 6497, Amended, 03/24/2010. Prior code § 10.18.094)

13.56.130 Public expenditures.

No provision of this chapter shall be construed to prohibit the city from expending public funds to maintain or improve its existing water distribution system or to prohibit the city from spending public funds for such main extensions as may be deemed necessary for planned improvements of the city's water distribution system.

(Ord. 6497, Amended, 03/24/2010)

13.56.140 Fees and charges for service - Installation fee required.

- A. The Public Works Director shall determine, subject to city council approval and adoption by resolution, standard service fees, rates, and charges for applications, installations, repairs, extensions of service, and other service charges as necessary to implement the provisions of this chapter. If the installation fee or service charge is based on the actual cost of labor and materials for a specific service connection the director shall have the authority to determine the final charge.
- B. An installation fee shall be paid to the finance department by the person applying for such installation before the work of connecting the main with the property is begun; provided, that whenever the installation fee is based on the cost of labor and materials as determined by the director and the estimated cost is not sufficient to cover the total expense for labor and material, the deficit shall be charged to the property for which such installation was made and to the owner thereof. If the estimated cost is in excess of the actual costs of installation, any amounts in excess of the standard service connection fee shall be returned to the person applying for the installation. All delinquent and unpaid charges for installations shall become a lien upon the premises supplied and be collected in the same manner as other delinquent and unpaid charges for water.

(Ord. 6497, Amended, 03/24/2010; Ord. 6308, Amended, 11/07/2001)

13.56.142 System development charges.

A. General.

1. In addition to the fees for installation of water service as provided in this chapter, the utility shall collect system development charges (SDC) from property owners that directly benefit from utility-built or privately built water service facilities, except property owners who previously paid their fair share through an LID, ULID, or late-comer charge. Facilities that may be covered in a SDC include, but are not limited to, lines built from the water main to the property line, fire hydrant assemblies, pump stations, reservoirs and distribution and transmission mains.
2. The SDC is the property owner's equitable share of the established costs of the facilities he/she benefits from. The equitable share may include interest charges applied from the date of construction acceptance of the facility until the property connects, or for a period not to exceed 10 years, whichever is less, at a rate commensurate with the rate of interest applicable at the time of construction of the facility to which the

property owner is seeking to connect but not to exceed 10 percent per year; provided, that the aggregate amount of interest shall not exceed the equitable share of the cost of the facility allocated to such property owner.

B. *Computation of SDC.*

1. The SDC authorized by RCW [35.92.025](#) shall be levied in an amount determined by the director of public works and approved by the city council.
2. The costs of the facilities shall be allocated to benefiting property owners based on equivalent residential units (ERU) unless the superintendent determines that an allocation based on front footage or other reasonably based methodology better assures equitable sharing of cost by all properties benefiting from the facilities.
3. SDC that have been paid as a result of prior development activities or through participation in an LID or ULID will not be re-assessed.

C. *Payment of SDC.*

1. SDC shall be paid:
 - a. Before a property is allowed to connect to the public water system.
 - b. At the time of redevelopment of the property, if SDC apply that have not yet been paid such as charges for new facilities that directly benefit the property.
2. The utility may enter into contracts with the owners of existing single-family residences and with the owners of redevelopment projects that meet criteria specified by the utility for payment of SDC over time instead of as a lump sum. The utility will charge interest at a rate set by the finance director on any outstanding debt covered by a payment contract. A contract shall be payable in full at the time of closing upon sale of the property. Such installment contract shall describe the property served, shall be acknowledged by the property owner and shall be recorded by the superintendent with the Grays Harbor County auditor at the expense of the property owner. Delinquent payments under such installment contract shall be a lien upon the described property as provided in RCW [35.21.290](#) and the water service to such property may be cut off in accordance with RCW [35.21.300](#) until the delinquent installments are paid. Upon full payment of the contract, the superintendent on behalf of the city shall execute and deliver to the property owner a release of such lien.

(Ord. 6497, Amended, 03/24/2010)

13.56.144 Fire flow - Connections restricted.

No connection to the city water system shall be allowed, or building permit issued, for new construction, improvements, developments, redevelopments or modifications to existing buildings or portions of buildings that place additional demand on the water system after if the fire flow and flow duration requirements placed upon

the water system as a result of such connection would exceed the systems ability to meet the requirements established by the Uniform Fire Code as adopted by the city.

(Ord. 6497, Amended, 03/24/2010; Ord. 6149, Added, 02/12/1997)

13.56.150 Private service pipes—New and existing services.

Before the water will be turned on to any premises connected with the city's mains, the service pipes upon such premises must be made to conform to Chapter [15.32](#) AMC (Uniform Plumbing Code). Every existing service or branch service that is not in compliance with Chapter 15.21 AMC must be brought into compliance at the owner's expense as soon as the defect is noted.

(Ord. 6497, Amended, 03/24/2010)

13.56.160 Change in size or location of pipe—Renewal of abandoned service.

When new buildings are to be erected on the site of the old ones and it is desired to increase the size or change the location of the old service connection, or where a service connection to any premises is abandoned or allowed to be shut off for a period of one year, the superintendent may cut out or remove such service connection, after which, should a service connection be required to said premises, a new service shall be placed only upon the owner making an application and paying for a new tap and service in the regular manner. But any change made in tap shall be made from nearest point on property line.

(Ord. 6497, Amended, 03/24/2010)

13.56.170 Laying of new main—Application for tap.

When a new main is laid in any street or alley, owners of premises on said street or alley, or within one-half block on side streets, who are being supplied with city water from a private main or other city main or connection to a private service shall make application for tap and shall connect up with a separate service connection to the main as provided for in Section [13.56.050](#).

(Prior code § 10.18.150)

13.56.180 Failing to comply with Section 13.56.170.

Any person, firm or corporation owning, operating or receiving service from a private water main not complying with Section [13.56.170](#) within ninety (90) days shall be notified to remove or disconnect such service or water main where it extends along or across any street or alley within the city of Aberdeen. If the service or main is not

removed or disconnected within ten (10) days after such notice is served, the city may remove or disconnect such service or main without further notice to the parties affected by such action.

(Ord. 6497, Amended, 03/24/2010)

13.56.190 Activation of service—Account set-up charge.

Before the water will be turned on to any premises connected with the city's mains, or any closed account reactivated or new account opened, the owner, or an agent authorized in writing by the owner to open an account in the owner's name, must apply in writing at the water department office and pay an account set-up charge together with all delinquent water service charges which have become a lien against the premises under AMC [13.56.230](#). The property owner shall have the right to have water bills mailed to a tenant, or agent, but this shall not relieve the property from liability for water charges incurred.

(Ord. 6497, Amended, 03/24/2010)

13.56.200 Disconnection of service—Reconnection—Service fee.

A. Except as authorized in subsection C, below, it is unlawful for any owner of any premises connected with the city's water supply to disconnect the water on said premises unless he or she first files in the office of the superintendent, on a printed form to be furnished for that purpose, a written request that the service of water to said premises be discontinued and pays all arrearages on water rates for said premises. When water has been shut off from any premises upon the application of the owner thereof, or for nonpayment of water charges, or for any other cause, it is unlawful for any person again to connect such premises with water without first applying for an account pursuant to Section [13.56.190](#).

B. Where the owner or occupant requests a service call to turn the water service on or off in order to make repairs or replacements of the service pipe between the city shut-off valve and the building supplied, a service repair fee shall be charged for service calls.

C. Owners of premises may install a private premise isolation valve as approved by the superintendent for the purpose of turning the water service on or off without making a service call or incurring a service repair fee. If a service call is required to assist in the operation of a private premise isolation valve a service repair fee will be charged.

(Ord. 6497, Amended, 03/24/2010)

13.56.210 Unauthorized turn-on/shutoff at main or removal.

When a water service has been shut off or disconnected by the city for any cause, and the service is re-connected or turned back on by the owner or occupant, or for the benefit of the owner or occupant, no remission of rates will

be made on account of its having been shut off. In cases where a meter reading is not available the director shall estimate the monthly charge from the date the city shut-off or disconnected the service. In addition to the charges for water an "unauthorized activation fee" shall be charged to the account. The director, in order to prevent further unauthorized connections at the premises served, may shut off the water at the main, or remove a portion of the service connection in the street. If the owner of the property was responsible for, or directly benefited from, the unlawful activation the actual cost of cutting out and reinstating the water supply shall be charged against the account for the premises.

(Ord. 6497, Amended, 03/24/2010)

13.56.230 Liability for rates and charges—Lien against premises—Refusal of service.

A. The city shall have a lien against the premises to which water services were furnished for four months charges therefor due or to become due, but not for any charges more than four months past due; provided, that the owner of the premises or the owner of a delinquent mortgage thereon may give written notice to the superintendent to cut off service to such premises accompanied by payment or tender of payment of the then delinquent and unpaid charges for such service against the premises together with a cut-off charge, whereupon the city shall have no lien against the premises for charges for such service thereafter furnished, nor shall the owner of the premises or the owner of a delinquent mortgage thereon be held for the payment thereof.

B. In case any charges for water become a lien against any premises, the water shall be cut off until such charges are paid. No change of ownership or occupancy shall affect the application of this section.

(Ord. 6497, Amended, 03/24/2010)

13.56.240 Water for new construction and remodeling.

Water for new construction and remodeling will only be furnished upon the application of the owner of the property or an agent authorized in writing by the owner to apply for service. All water for new construction or remodeling shall be charged against the property upon which it is used and the owner thereof, and all delinquent and unpaid charges shall become a lien upon the premises supplied and be collected in the same manner as other delinquent and unpaid charges for water. Water for new construction shall be furnished for up to six months, and water for remodeling for up to two months, without monthly billing statements after which time the account will either be activated, together with other utility services, and all charges for water used during the construction or remodeling period will be brought current or the service will be shut off. The Director may for good cause authorize extensions of the six month or two month periods, upon payment of water charges only, where building permits are still active and other city utility services are not being utilized.

(Ord. 6497, Amended, 03/24/2010)

13.56.260 Disconnection of service to condemned premises.

The Building Official and county health officer shall report in writing to the director all buildings or premises condemned or closed by their orders, such report to contain the official house number, street name, the name of the owner of such building or premises, and the date the premises were ordered to be vacated. The director shall shut off or disconnect water service to the premises as required by the order of the Building Official or health officer. Water service necessary to repair the premises or comply with an abatement order may be provided pursuant to AMC [13.56.240](#).

(Ord. 6497, Amended, 03/24/2010)

13.56.290 Emergency water use restrictions.

- A. Director may restrict water use. The use of water for any purpose other than domestic consumption and sanitation may be restricted or prohibited in times of emergency or water shortage as determined by the director.
- B. *Public notice.* The director shall issue water use restrictions in writing setting forth the types of uses or means of distribution prohibited or restricted, the time of day or geographic areas affected, and any other restrictions necessary to preserve the city's domestic water supply. The restrictions shall be published in the official city newspaper before they take effect. In the event an emergency prevents prior publication of restrictions, the restrictions shall take effect immediately upon posting and shall be published as soon as practicable.
- C. *Penalties.* Any person violating a water use restriction imposed under this section shall be guilty of a misdemeanor. In addition to any criminal penalty, the director may shut-off or disconnect water service to the premises if necessary to prevent repeated violations. The account for any water service shut-off or disconnected shall be charged a service fee for both the shut-off and any subsequent reactivation.

(Ord. 6497, Amended, 03/24/2010)

13.56.310 Irrigation and use of water hoses.

- A. It is unlawful for any person to use water for sprinkling or irrigating lawns, gardens, flower beds, plants, trees, shrubs, or parking strips, or for washing cars, hosing windows, woodwork, porches, steps or walks, through any hose greater than one (1) inch in diameter or nozzle with a flow rating greater than XXX gallons per minute, or through any leaky or defective hose nozzle, or through more than one set of hose or through a hose with a nozzle detached, or through such hose with or without such nozzle attached.
- B. It is unlawful for any person wilfully to place any automatic sprinkling device or wilfully place or hold any hose in such position or manner that water there from falls on any person while on any public street or sidewalk.

(Ord. 6497, Amended, 03/24/2010)

13.56.340 Right of city to shut off water—Nonliability for damage.

The city reserves the right at any time, without notice, to shut off the water supply for repairs, extensions, nonpayment of rates, or any other reason, and the city shall not be responsible for any damage, such as bursting of boilers, supplied by direct pressure, the breaking of any pipes, or fixtures, stoppages or interruption of water supply, or any other damage, resulting from the shutting off of the water.

(Prior code § 10.18.330)

13.56.350 Responsibility for damages resulting from leaks on private premises - right to shut off service or make repairs.

The service pipes, connections and other apparatus within any private premises must be kept in good repair and protected from freezing at the expense of the owner or lessee, who will be responsible for all damages resulting from leaks and breaks. In case of neglect to promptly repair any service or fixtures, or make any changes or alterations required in this chapter, the superintendent shall have authority when deemed necessary to shut-off the water service or to go on the premises and make or cause to be made such changes, alterations or repairs, and charge the same against the premises and the owner thereof.

(Ord. 6497, Amended, 03/24/2010)

13.56.360 Leaks under a street—Excavation by water department—Repair of leak.

Where there is a leak under the street, and it is doubtful whether the water comes from a break in the city main, or from a private service pipe, the water department will make an excavation to determine which it is from. If the leak is found to be from the main, the water department will make all repairs, free of charge; but if it is from the service pipe, the owner of the property or agent will be notified and must immediately take charge of the excavation, repair the leak, and replace the street, and be responsible for all damages which may result. In case the owner or agent does not make repairs at once, the water department will proceed, and all bills for labor and material will become a charge against said property and shall be collected from the owner or agent at the end of the month. In case the bill is not paid, the enforcement of payment thereof will be performed in the same manner as for the payment of bills for water rentals.

(Prior code § 10.18.350)

13.56.370 Wasting of water unlawful.

It is unlawful for any person to waste water or allow it to be wasted by imperfect or leaking stops, valves, pipes, closets, faucets, or other fixtures, or to use water closets without self-closing valves, or allow any pipes of faucets

to run open to prevent the service from freezing or for any other reason, or to use the water for purposes other than those named in the application upon which rates for water are based, or for any other purpose than that for which his contract provides, or to use it in violation of any provision of this chapter.

(Prior code § 10.18.360)

13.56.390 Fire protection services.

- A. Connections with the city mains for standpipe and sprinkler service to be used for protection in case of fire, will be made upon application thereof as provided in Section [13.56.020](#) of this chapter. Such connections must be made entirely separate from the regular service taps, the complete installation to be made under the supervision of the water department and paid for by the applicant.
- B. To cover the cost of carrying a supply of water under pressure in such service, cost of inspection and possibility of leakage and waste, an annual charge will be made at the rates to be provided in the rules of the water department.
- C. Every valve or outlet must be sealed. Seals must be broken only in case of fire and in such case prompt notification must be made to the director, and the valve will be resealed. A broken seal fee will be charged to the premises served for each sealed valve opened without an immediate notification to the water department.
- D. The premises upon which any such fire protection service is installed shall be opened to the inspection of any authorized representative of the water department at all times, and the owner or tenant shall give such representative all reasonable facilities for making the inspection, and any information he may require. The owner or tenant can test the apparatus at any time by notifying the superintendent of water that such a test is desired, and a time will be fixed for the test to be made; no water shall be used for commercial purposes from fire hydrants or service pipes for fire hydrants. All service for fire protection and sprinkler systems shall be kept separate and disconnected from water pipes used for commercial purposes.

(Ord. 6497, Amended, 03/24/2010. Prior code § 10.18.380)

13.56.400 Tapping of fire service pipe—Penalty.

Any property owner or lessee on whose premises a fire protection service is installed, who shall tap or allow to be tapped, any fire service pipe on his or her premises, shall be guilty of a misdemeanor.

(Prior code § 10.18.390)

13.56.410 Inspection of premises supplied with water from city's mains.

The superintendent shall have the right to inspect at all reasonable hours all parts of buildings or premises supplied with water from the city's mains for the purpose of making assessments, inspecting the condition of pipes and fixtures, noting the amount of water used, and the manner in which it is used.

(Prior code § 10.18.400)

13.56.430 Meters—Property of city—Damaging.

- A. All meters shall be and remain the property of the city. The charge for flat or metered fire service shall be a ready-to-serve charge, and charge for water consumed.
- B. In all cases where meters are lost, injured or broken by carelessness or negligence of owners or occupants of premises, they shall be replaced or repaired by or under the direction of the superintendent and the cost charged against the owner or occupant, and in case of nonpayment, water shall be shut off and will not be turned on until such charge and the charge for turning on the water are paid. In event of the meter getting out of order by failing to register properly, the consumer shall be charged on an estimate made by the superintendent on the average monthly consumption during the last three months that the same was in good order, or from what he may consider to be the most reliable data at his command.

(Prior code § 10.18.440)

13.56.450 Failure to receive charges in mail.

Failure to receive mail will not be recognized as a valid excuse for failure to pay rates when due. Change in ownership of property and change in mailing addresses must be filed in writing at the office of the superintendent.

(Ord. 6497, Amended, 03/24/2010)

13.56.470 Enforcement of chapter - assistance from other departments.

The director is authorized to enforce the provisions of this chapter, the Cross-Connection Control Program adopted pursuant to AMC [13.56.620](#), and all other ordinances relating to the operation of the city's water utility. It shall be the duty of the employees of the police, fire, engineering, streets and sewer departments to give vigilant aid to the director in the enforcement of the provisions of this chapter, and to this end they shall report all violations thereof which come to their knowledge to the director. It shall be the duty of the chief of the fire department to report immediately to the director in case of fire in premises having metered service for fire protection purposes that the fire has occurred therein.

(Ord. 6497, Amended, 03/24/2010)

13.56.480 Unlawful to obstruct access to or injure fire hydrants.

It is unlawful for any person to obstruct the access to any fire hydrant by placing around or thereon any stone, brick, lumber, dirt, or other material, or to open or operate any fire hydrant, or draw or attempt to draw water therefrom, or to wilfully or carelessly injure the same.

(Prior code § 10.18.490)

13.56.490 Unlawful to tamper with fire hydrant, or valves belonging to city - emergency use auxiliary water supply restricted.

A. It is unlawful for any person, except when duly authorized by the superintendent, or who shall be a member of the fire department, to open, operate, close, turn on, turn off, interfere with, attach any pipe or hose to or connect anything with any fire hydrant, or valve belonging to the city.

B. Any person requiring the use of any hydrant or valve belonging to the city for auxiliary water supply must make written application for the same in advance to the superintendent. The superintendent shall require the applicant to execute a contract containing the appropriate backflow prevention measures under the city's Cross-Connection Control Program for the particular use intended and requiring payment of all fees and charges for equipment and water use. The superintendent may require that tanker trucks and other auxiliary supply vessels use a designated hydrant filling station maintained by the city. All hydrant use shall be metered. The superintendent may require a deposit in advance for supplying such water.

(Ord. 6497, Amended, 03/24/2010)

13.56.500 Unlawful to damage water department property.

It is unlawful for any person, unless duly authorized by the superintendent, to disturb, interfere with or damage any water department facility or equipment, including any water main, water pipe, machinery, tools, meters, or any other appliances, buildings, improvements, lawns, grass plots, flowers, vines, bushes or trees belonging to, connected with or under the control of the municipal water supply system of the city of Aberdeen.

(Ord. 6497, Amended, 03/24/2010)

13.56.510 Unlawful to pollute city water supply.

It is unlawful for any person, firm or corporation to deposit, or suffer to be deposited, in any spring, well, stream, river, reservoir, or lake, the water of which is, or may be, used for drinking purposes, or on any property owned,

leased or otherwise controlled by the city of Aberdeen as a water shed or drainage basin for the water system of the city of Aberdeen, or any part or portion thereof, any matter or thing whatsoever, dangerous or deleterious to health, or any matter or thing which may or could, pollute the waters of such spring, well, stream, river, reservoir, lake or water system.

(Prior code § 10.18.520)

13.56.515 Addition of fluoride—Administration.

A source of fluoridation approved by the state of Washington Department of Health shall be added to the city of Aberdeen water supply under the rules and regulations of said department, such addition to be administered by the superintendent.

(Ord. 6191, Added, 07/15/1998)

13.56.520 Unlawful to connect with main or city water pipe without permission.

It is unlawful for any person to make connections with any fixtures or connect any pipe with any water main or water pipe belonging to the municipal water supply system, without first complying with Section [13.56.020](#).

(Prior code § 10.18.530)

13.56.530 Remission of rates—Generally.

Remission of rates shall only be made on recommendation of the public works committee and adopted by the city council; provided, that a consumer whose meter bill is excessive over bills of the preceding three months, and the consumer declares that his or her use of water was not in excess of previous months, the superintendent shall investigate such premises; if he finds leaky pipes and said leaks are so concealed that the consumer would not ordinarily in the occupation of the premises discover said leaks, then and in that event, the superintendent may grant said consumer credit for a part of the water so used. In the adjustment of an excessive bill caused by a leaky water pipe, or other common causes, the superintendent shall, by considering the past three months use of water, so make an adjustment that the city and the owner each shall stand one-half of the loss by leakage over and above the ordinary use of water; provided, that all pipes and fixtures on the premises shall have been immediately repaired, upon the consumer discovering, or being notified of said leak. In the event of a broken pipe caused by freezing, floods, slides, or other unforeseen cause, adjustments may be made by the superintendent in conformance with foregoing paragraph, when in his judgment, proper precautions were taken to protect said water pipes from such damages.

(Prior code § 10.18.540)

13.56.540 Payment of water service charges—Delinquencies - shut off notices.

- A. All fixed rates, flat rates and ready-to-serve rates for water service by the city shall be billed and payable monthly.
- B. All metered water accounts shall be billed and payable monthly. Metered accounts shall be charged the minimum meter rate, together with a charge for water used in excess of the minimum rate during the preceding period. Meter readings shall be made monthly.
- C. All water charges shall be paid at the finance department during regular business hours. In the event the water charges are not received within twenty-one (21) days of date of billing, the same shall be delinquent. When the twenty-first day falls upon a Saturday, Sunday or legal holiday, the date of delinquency shall be the next following business day. In the event of any delinquency, the City shall have all remedies as provided in this chapter or by any other applicable law, including, without limitation, liens and/or shutting off the service. A delinquency charge will be assessed against the account, regardless of whether the water has been shut off or not. Whenever water service is shut off by reason of delinquency a service restoration charge shall be made in advance to have water service restored.
- D. Before any water service is shut off for delinquency, the director shall provide written notice of nonpayment at least 10 days prior to actual shut off of service. The written notice shall be mailed to the premises' occupant and owner or owner's agent, if the owner provides written instructions to mail notices to an agent. The notice shall include the following information:
 1. That payment for service is overdue, the total amount due, and that the statutory lien may be imposed;
 2. That service will be shut off unless payment in full is made to the City within 10 days; that tenants in possession will not be required to pay delinquencies for previous occupants who moved out before the current occupants moved in;
 3. The address and telephone number to contact for billing information or to request a hearing;
 4. That service will not be shut off while a hearing is pending;
 5. That the City will charge a shut-off and turn-on fee before service is resumes following a shut-off of service.

(Ord. 6497, Amended, 03/24/2010; Ord. 6252, Amended, 06/28/2000)

13.56.550 Delinquent payments - Hearings - Adjustments and security deposits.

The director, or the director's designee, shall conduct any hearings requested to contest delinquencies, shut-off notices, or security deposit requirements. If the director determines that the security deposit required was not

justified by a tenant's own credit worthiness or the delinquency was due to billing errors, the intervention of strangers, sickness, or other meritorious causes, the director may correct any errors in the amount of the security deposit or billing and issue a credit memorandum receipt in lieu of the delinquency charge and shall state on the credit memorandum receipt the cause or causes for issuance.

(Ord. 6497, Amended, 03/24/2010)

13.56.560 Utility service request notices - Prorated charges - Approved forms required.

- A. All utility service request notices to activate or discontinue services shall be made in writing upon a form provided by the water department for that purpose and shall be filed with the Finance Department during regular business hours. The director may accept requests to discontinue service by mail when the writing substantially complies with the approved form, is signed by the owner listed on the account, and contains the street address of the premises. It is the responsibility of the owner or designated agent to confirm that service request deposited in the mail were actually received by the city.
- B. When a utility service request to activate or discontinue services is received by the city, monthly charges for water, and all other city utility services billed through the water account shall be prorated. The effective date for prorating will be the business day that the notice is received by the city.
- C. Premises shall not be supplied with water, except for new construction or remodeling, until the correct house number is in place near the entrance of the building.

(Ord. 6497, Amended, 03/24/2010)

13.56.570 Utility service request notices - vacant premises - occupied premises - security deposits.

- A. The owner of any vacant or occupied premises may at any time sign a utility service request notice to activate water service and other mandatory city utilities billed through the water account to the premises upon a form provided for that purpose at the office of the water department.
- B. The owner of any vacant premises may at any time discontinue services by filing a service request notice. Upon the filing of the request and the payment of all service and shut-off charges, the owner shall be relieved of further responsibility regarding water charges accrued against the premises and the water service shall be shut off.
- C. The owner of any dwelling unit occupied by someone other than the owner may at any time file a service request notice to discontinue services for occupied premises on a form provided for that purpose by the water department. The owner shall provide the names, mailing addresses, and telephone numbers, if known, of the persons occupying the dwelling unit. Upon the filing of the request and the payment of all service and shut-off

charges, the owner shall be relieved of further responsibility regarding water charges accrued against the premises. The water service to occupied dwelling units shall not be shut off on the owner's request until at least ten days notice has been posted on the premises informing the occupants that: [1] the owner has signed a shut off order; [2] the occupants may maintain water service by paying all current charges from the date of the shut-off order; [3] the amount of the current charges due; [4] whether or not a security deposit will be required; [5] the address and telephone number to contact for billing questions or to request a hearing; and [6] service will not be shut-off while a hearing is pending.

D. The director may require security deposits, as approved by the city council, as a condition of authorizing continued water service to occupied dwelling units after the owner of the premises has signed a shut-off order. The security deposit shall be based on the occupant's own creditworthiness and shall be uniformly applied to all tenants where the owner is delinquent or has signed a shut-off notice.

(Ord. 6497, Amended, 03/24/2010)

13.56.580 Questions not covered by chapter.

The superintendent, with the approval of the Public Works committee shall have the authority to decide any question which may arise and which is not fully covered by any of the provisions contained in this chapter, and their decision in such cases shall be final.

(Ord. 6497, Amended, 03/24/2010)

13.56.600 Violation—Penalty.

Any person violating any of the provisions of this chapter shall be deemed guilty of a misdemeanor.

(Ord. 6497, Amended, 03/24/2010)

13.56.610 Chapter part of contract—Suspension of action where injustice.

A. A copy of this chapter may be obtained without charge by all owners of property and consumers of water. The provisions of the chapter shall be considered a part of the contract made between the city and every owner and consumer.

B. When it appears to the director that a strict enforcement of the provisions of this chapter would work a gross injustice upon a utility customer, the director is authorized to suspend action in such case until it is referred to the public works committee and acted upon as provided in AMC [13.56.580](#).

(Ord. 6497, Amended, 03/24/2010)

13.56.620 Cross-connection Control Program.

A. *Adoption of state regulations – Director authorized to adopt further regulations.* Rules and regulations of the Washington State Department of Health regarding public water supplies, entitled "Cross-Connection Control," WAC [246-290-490](#), as they presently exist and as they may, from time to time, be amended, are hereby adopted and incorporated herein by this reference as if set forth in full. The Public Works Director is authorized and directed to adopt and enforce a Cross-Connection Control Program (CCP) regulating the provision of water services. The CCP shall be consistent with state regulations and this chapter. The CCP shall be published on the city's web page and copies shall be furnished without charge upon request. It shall be unlawful to violate or fail to comply with the regulations adopted by the director and published in the CCP.

B. *Backflow prevention assemblies to be installed.* In addition to situations requiring backflow prevention assemblies as set forth subsection A, above, the city reserves the right, as a condition of water service, to require any party seeking water service to install a backflow prevention assembly when the city, or the city's designated cross-connection control specialist, determines a need to protect the city's water system and/or facilities. All backflow prevention assemblies shall be installed and maintained by, and at the expense of, the customer.

C. *Inspection of backflow prevention assemblies.* Backflow prevention assemblies installed shall be inspected and tested:

1. At the time of initial installation;
2. Annually after initial installation;
3. After the device is repaired;
4. After the device is moved, relocated, or reinstated; and
5. More often if tests indicate repeated failures

The city shall provide 30-day advance notification to the customer of the required annual test of the backflow prevention assembly. Failure of the city to provide notification shall not affect the customer's duty to obtain testing under this section. The customer shall have such test performed by a Backflow Assembly Tester certified by the Washington State of Health, and the results shall be delivered to the city on a form prescribed by the city. If such test is not performed within the time required herein, the city may initiate proceedings for termination of water service.

D. *Repair, overhaul or replacement.* The customer shall be responsible for the repair, overhaul or replacement of backflow prevention assemblies as required by the city whenever they are found to be defective within a time period as required by the city.

(Ord. 6497, Amended, 03/24/2010)

The Aberdeen Municipal Code is current through Ordinance 6661, passed February 26, 2020.

Disclaimer: The city clerk's office has the official version of the Aberdeen Municipal Code. Users should contact the city clerk's office for ordinances passed subsequent to the ordinance cited above.

Note: This site does not support Internet Explorer. To view this site, Code Publishing Company recommends using one of the following browsers: Google Chrome, Firefox, or Safari.

[City Website: www.aberdeenwa.gov](http://www.aberdeenwa.gov)

City Telephone: (360) 537-3231

[Code Publishing Company](http://www.codepublishing.com)

Chapter 13.60

WATER—RATES AND CHARGES

Sections:

- 13.60.010 Rates.**
- 13.60.020 Charges for temporary connections.**
- 13.60.030 Ready-to-serve charge of different size services for fire protection.**
- 13.60.040 Rates for users outside corporate limits.**
- 13.60.050 Industrial water for commercial purposes.**
- 13.60.060 Computation of rates per meter.**

13.60.010 Rates.

A. The following rates, consisting of a fixed-rate minimum plus a tiered metered rate for additional consumption, shall be charged for the use of city water within the corporate limits of the city:

	2020	2021	2022	2023	2024+
Fixed-rate minimum—in hundred cubic feet	Monthly Rate				
Single-Family/Duplex Residential: 0—3.99 (A duplex with two individual meters shall be billed as two single-family residences)	\$26.78	\$29.78	\$32.78	\$35.78	\$38.78
Low-Income Senior (age- and income-qualified)	\$21.42	\$23.82	\$26.22	\$28.62	\$31.02
Commercial (for 5/8 and 3/4 inch meters): 0—3.99	\$28.09	\$31.23	\$34.38	\$37.52	\$40.67
Consumption in hundred cubic feet	Additional Charge per Hundred Cubic Feet				
4.00—12.99	\$1.89	\$1.97	\$2.04	\$2.13	\$2.21
4.00—12.99 (commercial only)	\$3.78	\$3.93	\$4.09	\$4.25	\$4.42
13.00—30.99	\$3.78	\$3.93	\$4.09	\$4.25	\$4.42
31.00—60.99	\$3.78	\$3.93	\$4.09	\$4.25	\$4.42
61.00—up	\$2.57	\$3.00	\$3.50	\$4.00	\$4.42

Annual CPI Adjustment. The rates established above shall be increased automatically each year, beginning with January 1, 2025, based on the change in the Consumer Price Index (CPI) for the greater Seattle area for the twelve

(12) month period of July 1st to June 30th immediately preceding the date of the increase; provided, that the annual CPI adjustment shall not be less than zero (0) percent and shall not exceed five (5) percent.

B. The fixed-rate minimum charge for commercial accounts, multiple family dwellings, mobile home parks, and housing projects with meter sizes larger than three-fourths-inch diameter shall be determined by applying the above additional consumption charges to the following minimum consumption levels:

Minimum Consumption (in hundreds of cubic feet)	Meter size (in inches)
12	1
26	1 1/2
48	2
105	3
190	4
440	6
750	8 and larger.

(Ord. 6655 § 2, Amended, 11/13/2019; Ord. 6555, Amended, 01/08/2014; Ord. 6536, Amended, 12/12/2012; Ord. 6422, Amended, 12/13/2006; Ord. 6351, Repealed & Replaced, 02/25/2004; Ord. 6271, Reenacted, 11/22/2000; Ord. 6232, Amended, 11/24/1999; Ord. 6208, Amended, 12/16/1998; Ord. 6168, Amended, 11/19/1997; Ord. 6139, Amended, 10/23/1996)

13.60.020 Charges for temporary connections.

Temporary connections for circuses, carnivals, cisterns, tanks, or similar uses shall be charged a minimum fixed rate of two hundred fifty dollars (\$250.00) and the additional consumption metered charges in Section [13.60.010](#).

(Ord. 6655 § 3, Amended, 11/13/2019; Ord. 6351, Amended, 02/25/2004; Ord. 6271, Reenacted, 11/22/2000; Ord. 6232, Amended, 11/24/1999; Ord. 6208, Amended, 12/16/1998; Ord. 6168, Amended, 11/19/1997; Ord. 6139, Amended, 10/23/1996)

13.60.030 Ready-to-serve charge of different size services for fire protection.

The monthly charge for all fire protection ready-to-serve services shall be as follows:

Four inches and smaller in diameter	35.00
Six and eight inches in diameter	60.00
Ten inches and larger in diameter	120.00

(Ord. 6655 § 4, Amended, 11/13/2019; Ord. 6351, Amended, 02/25/2004)

13.60.040 Rates for users outside corporate limits.

Beginning March 1, 2004, the rate charged for users of domestic water outside the corporate limits of the city shall be twenty-five (25%) higher than the rates scheduled in Section [13.60.010](#); provided, however, that existing contract rights shall not be affected hereby.

(Ord. 6351, Amended, 02/25/2004; Ord. 6232, Amended, 11/24/1999; Ord. 6208, Amended, 12/16/1998; Ord. 6168, Amended, 11/19/1997; Ord. 6139, Amended, 10/23/1996)

13.60.050 Industrial water for commercial purposes.

The rates for water charged for users of industrial water for commercial purposes shall be individually contracted for with the city.

(Ord. 6351, Amended, 02/25/2004; Ord. 6168, Amended, 11/19/1997)

13.60.060 Computation of rates per meter.

The rates by meter established by this chapter shall be computed separately on the basis of the reading on each individual metered service regardless of the number of meters any particular user may have.

(Ord. 6351, Amended, 02/25/2004)

The Aberdeen Municipal Code is current through Ordinance 6661, passed February 26, 2020.

Disclaimer: The city clerk's office has the official version of the Aberdeen Municipal Code. Users should contact the city clerk's office for ordinances passed subsequent to the ordinance cited above.

Note: This site does not support Internet Explorer. To view this site, Code Publishing Company recommends using one of the following browsers: Google Chrome, Firefox, or Safari.

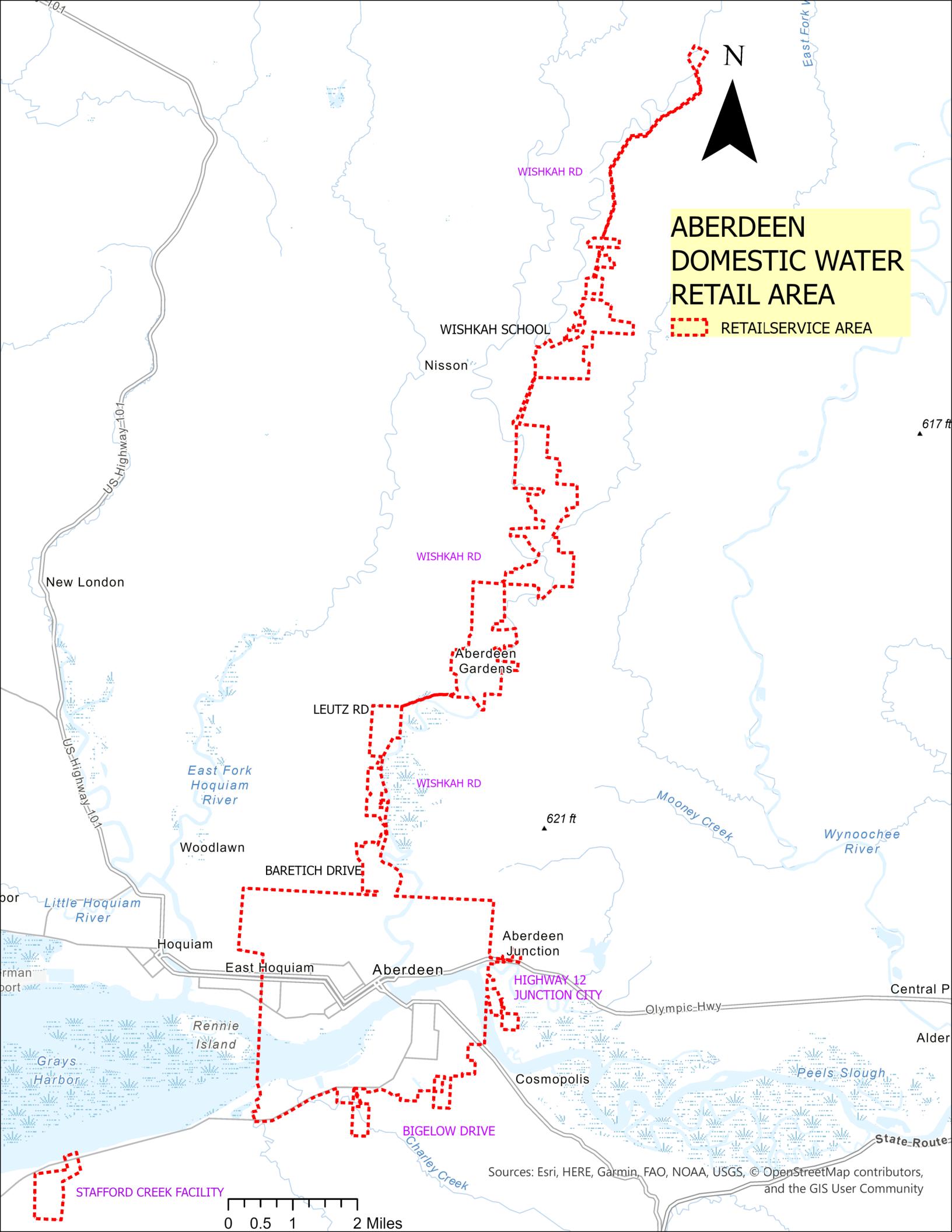
[City Website: www.aberdeenwa.gov](http://www.aberdeenwa.gov)

City Telephone: (360) 537-3231

[Code Publishing Company](#)

Appendix C

Retail Service Area



SERVICE AREA WISHKAH-3



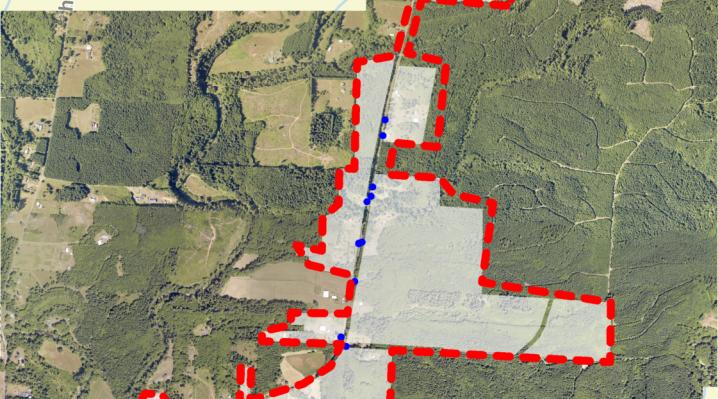
STATE FISHERIES

LEGEND

- WATER SERVICE RETAIL AREA
- WATER METERS
- WISHKAH RD SERVICE AREA



PIERCE RD



Greenwood-Rd

h-Rd

River

Helm Creek

2,500 1,250 0 2,500 Feet

Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

SERVICE AREA WISHKAH-2

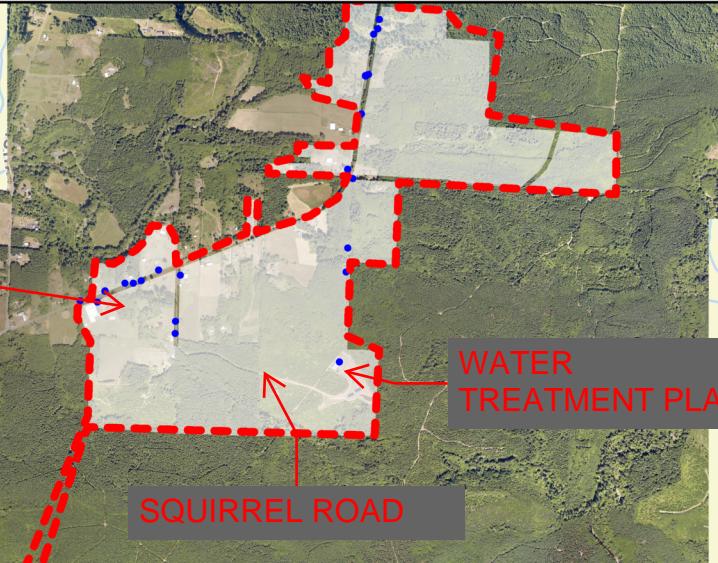
WISHKAH SCHOOL

Nisson

Hoquiam-Wishkah-Rd

E-Hoquiam-Rd

Wyman Creek

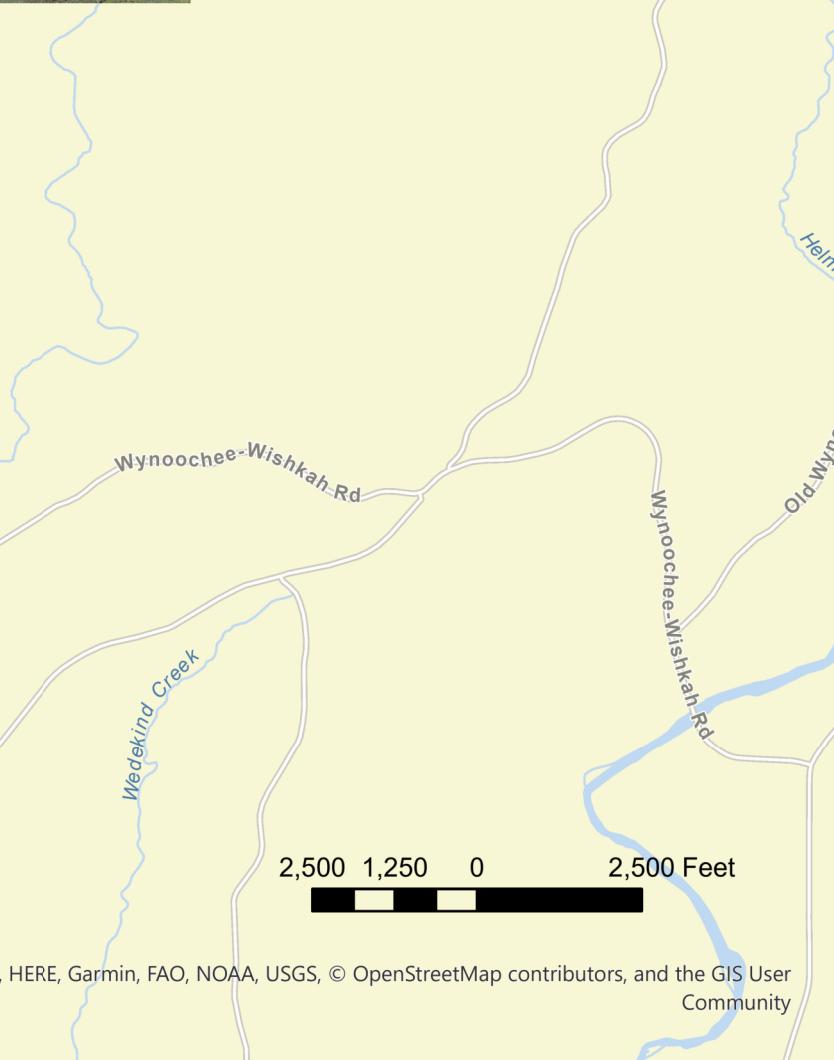


LEGEND

- WATER SERVICE RETAIL AREA
- WATER METERS
- WISHKAH RD SERVICE AREA

SQUIRREL ROAD

WATER
TREATMENT PLANT



2,500 1,250 0 2,500 Feet

Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

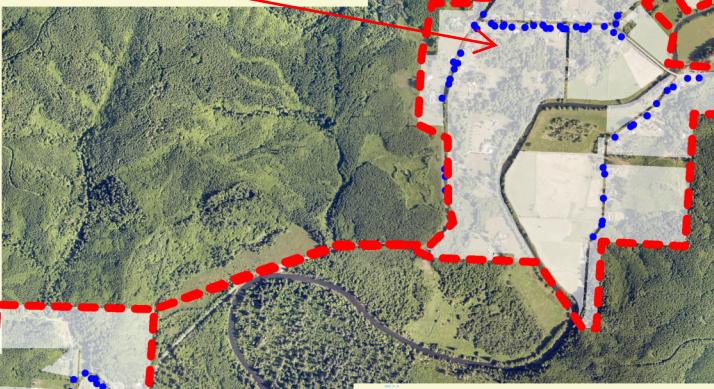
SERVICE AREA WISHKAH-1



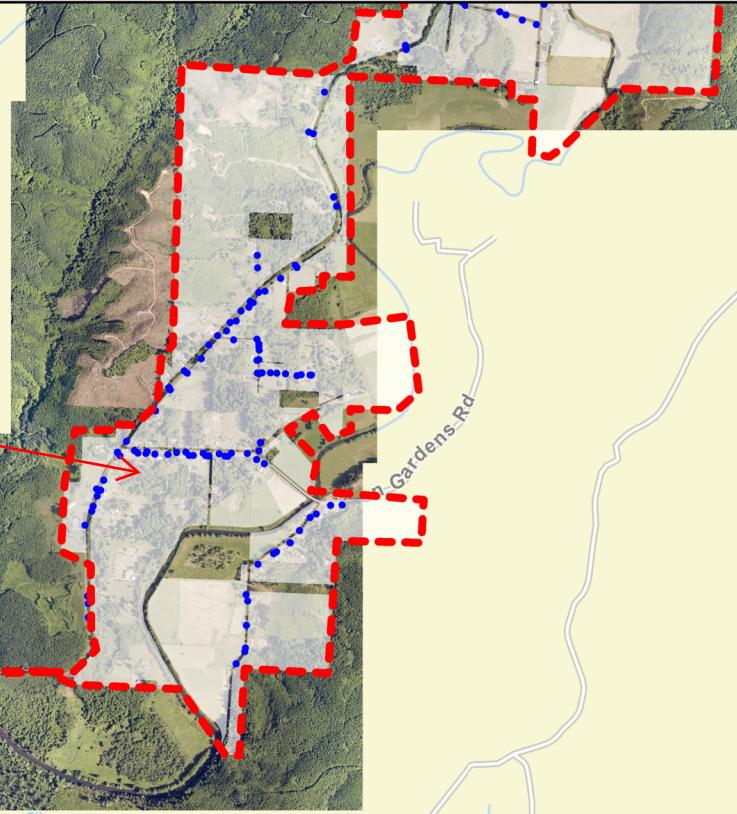
ABERDEEN
GARDENS

LEUTZ RD

BARETICH RD



WISHKAH RIVER



Bear Creek

Bear Creek

Mooney Creek

LEGEND

- WATER SERVICE RETAIL AREA
- WATER METERS
- WISHKAH RD SERVICE AREA

2,500 1,250 0 2,500 Feet

Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, ©OpenStreetMap contributors, and the GIS User Community

SERVICE AREA HWY12 & JUNCTION CITY



LEGEND

- WATER SERVICE RETAIL AREA
- WATER METERS
- HWY12 Service Area
- Junction City Service Area
- CITY OF ABERDEEN

HWY 12

SIERRA PACIFIC

JUNCTION CITY

Olympic Hwy

Linkshire Dr

Grays Harbor
Country Club

1,000 0 1,000 Feet

Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

2nd St
Cosmonopolis

SERVICE AREA BIGELOW & STAFFORD CRK

CITY OF
HOQUIAM

LEGEND

- WATER SERVICE RETAIL AREA
- WATER METERS
- BIGELOW SERVICE AREA
- CITY OF ABERDEEN



CITY OF
ABERDEEN

BIGELOW DRIVE

STAFFORD CREEK
CORRECTIONS
FACILITY



Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

2,500 1,250 0 2,500 Feet



Appendix D

**City of Aberdeen Consistency Checklist and County
Consistency Checklist**

Local Government Consistency Determination Form

Water System Name: City of Aberdeen PWS ID: 000509

Planning/Engineering Document Title: Water System Plan Plan Date: March 10, 2021

Local Government with Jurisdiction Conducting Review: City of Aberdeen Planning Division

Before the Department of Health (DOH) approves a planning or engineering submittal under Section 100 or Section 110, the local government must review the documentation the municipal water supplier provides to prove the submittal is consistent with **local comprehensive plans, land use plans and development regulations** (WAC 246-290-108).

Submittals under Section 105 require a local consistency determination if the municipal water supplier requests a water right place-of-use expansion. The review must address the elements identified below as they relate to water service.

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

	For use by water system	For use by local government
Local Government Consistency Statement	Identify the page(s) in submittal	Yes or Not Applicable
a) The water system service area is consistent with the adopted <u>land use and zoning</u> within the service area.	Pages 2-1 and 2-2	Yes
b) The <u>growth projection</u> used to forecast water demand is consistent with the adopted city or county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.	Page 3-11	Yes
c) For <u>cities and towns that provide water service</u> : All water service area policies of the city or town described in the plan conform to all relevant <u>utility service extension ordinances</u> .	Pages 1-2 and 1-3	Yes
d) <u>Service area policies</u> for new service connections conform to the adopted local plans and adopted development regulations of all cities and counties with jurisdiction over the service area.	Pages 1-2 through 1-6	Yes
e) <u>Other relevant elements</u> related to water supply are addressed in the water system plan, if applicable. This may include Coordinated Water System Plans, Regional Wastewater Plans, Reclaimed Water Plans, Groundwater Management Area Plans, and the Capital Facilities Element of local comprehensive plans.	Aberdeen Municipal Code – Page 1-2 and Appendix B; Reclaimed water - Page 5-6	Yes

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



Signature

Lisa Scott, Community Development Director, City of Aberdeen

Printed Name, Title, & Jurisdiction

2/17/2021

Date

Consistency Review Guidance

For Use by Local Governments and Municipal Water Suppliers

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

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

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

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

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

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

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

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



Local Government Consistency Determination Form

Water System Name: City of Aberdeen PWS ID: 000509

Planning/Engineering Document Title: Water System Plan Plan Date: March 10, 2021

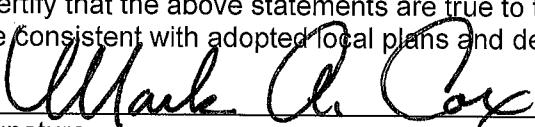
Local Government with Jurisdiction Conducting Review: Gray's Harbor County Planning Division

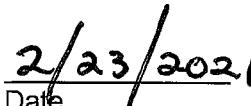
Before the Department of Health (DOH) approves a planning or engineering submittal under Section 100 or Section 110, the local government must review the documentation the municipal water supplier provides to prove the submittal is consistent with **local comprehensive plans, land use plans and development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

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

	For use by water system	For use by local government
Local Government Consistency Statement	Identify the page(s) in submittal	Yes or Not Applicable
a) The water system service area is consistent with the adopted <u>land use and zoning</u> within the service area.	N/A	Yes
b) The <u>growth projection</u> used to forecast water demand is consistent with the adopted city or county's population growth projections. If a different growth projection is used, provide an explanation of the alternative growth projection and methodology.	Page 3-11	N/A
c) For <u>cities and towns that provide water service</u> : All water service area policies of the city or town described in the plan conform to all relevant <u>utility service extension ordinances</u> .	Pages 1-2 and 1-3	N/A
d) <u>Service area policies</u> for new service connections conform to the adopted local plans and adopted development regulations of all cities and counties with jurisdiction over the service area.	Pages 1-2 through 1-6	N/A
e) <u>Other relevant elements</u> related to water supply are addressed in the water system plan, if applicable. This may include Coordinated Water System Plans, Regional Wastewater Plans, Reclaimed Water Plans, Groundwater Management Area Plans, and the Capital Facilities Element of local comprehensive plans.	Aberdeen Municipal Code – Page 1-2 and Appendix B; Reclaimed water - Page 5-6	N/A

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


Signature


Date

Mark A. Cox, Director of Community Development, Gray's Harbor County
Printed Name, Title, & Jurisdiction

Consistency Review Guidance

For Use by Local Governments and Municipal Water Suppliers

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



Local Government Consistency Determination Form

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

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

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

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

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

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

The Department of Health is an equal opportunity agency. For persons with disabilities, this document is available on request in other formats. To submit a request, please call 1-800-525-0127 (TTY 1-800-833-6388).

Appendix E
Watershed Control Report 2021

WATERSHED CONTROL PROGRAM SUMMARY CITY OF ABERDEEN 2021

Introduction

This Watershed Control Program Summary documents the key components of the City of Aberdeen's (City's) watershed control program, pursuant to WAC 246-290-668. Many of the required components have been prepared as separate documents/items, which are referenced or attached to this summary.

Watershed Description

The Wishkah watershed is defined as “the watershed for the domestic water supply of the city of Aberdeen” in the Grays Harbor County Code, chapter 13.12.010. The code sets the boundaries of the watershed. The subsequent sections of chapter 13.12 declare the County's jurisdiction over the watershed and establish the prohibitions, enforcement, and penalties of violating the laws established in the code.

The watershed encompasses a variety of landowners including lands of the City of Aberdeen and private lands. The code lays out rules about unlawful entrance into the watershed and explicitly prohibits deposit of any materials or substances which might in any way pollute or be harmful to the water derived in the area. The code chapters can be viewed here: [Grays Harbor Code - Chapter 13.12](#)

Forest Management Plan

The City of Aberdeen maintains a Forest Management Plan, most recently updated in 2018, that describes the City's management practices and future plans with its forest lands, including those lands within the Wishkah watershed. The City has a forester on staff who oversees management of the City's forests, including oversight of forest practices applications per the Department of Natural Resources Forest Practices Application Review System (FPARS).

Pertinent sections of the plan related to the Wishkah watershed are included in Attachment A. The plan states that the City's forests “shall be intensively managed to maximize wood fiber production and optimize revenue returns while ensuring the protection of ecosystem services such as clean air, clean water and wildlife habitat. Additionally, the plan notes that the Wishkah Watershed Management Block provides water supplies to the City, and that additional management considerations including seasonal logging and haul restrictions, low-impact operations, restrictions on herbicide use, and access control are implemented to protect water quality and quantity.

Watershed Ownership and Activities

For the past two decades, activity within the Wishkah Watershed has remained mainly timber

harvesting by the large landowners. Other than timber harvest, activity within the Watershed has remained limited, because of the remote location and controlled access.

Ownership in the Watershed has consolidated with Marvin Reiner selling to Rayonier in 2005 and Robert Reiner selling previously to Green Diamond. These sale agreements are included as attachments B and C, respectively. Both large landowners' activities are monitored through the Forest Practice Reviewer notification process for parcels within the Wishkah Watershed. At this time Rayonier has harvested approximately ninety percent of their ownership within the Watershed, while Green Diamond has been harvesting at a much more conservative amount yearly. Increased riparian buffers have helped maintain water quality along all major tributaries. Green Diamond has reported yearly on planned activities, while Rayonier has reported activities when scheduled, with both landowners abiding by the Watershed Agreements with the City of Aberdeen.

Wishkah Watershed hydrological boundary markings are maintained yearly along with new signage as needed. Landowner cooperation has maintained limited public entry, per Grays Harbor County Ordinance No. 50, except for Forest Service ownership.

In 2004 an access road and gravel pad were constructed on the east side of diversion reservoir to remove sediment from the 1997 failure of dam #2 on the west tributary. Since 2009 sediment removal has not occurred due to bridge restrictions on the Wishkah County Road. Bridge repairs are scheduled for 2011 and sediment removal should resume in 2012. A rain on snow event occurred in January 2009, resulting in a couple of road failures in the upper limits of the western portion of the Watershed, producing heavy sediment concentrations at the diversion dam. The Filtration facility has proven to be able to handle high NTU readings along with the City's ability to operate on reservoir storage for peak sediment events.

The City of Aberdeen harvested 41 acres of timber in 2006 in the central portion of the Watershed. The decision to harvest resulted from clear cutting abutting properties surrounding City ownership. Without this harvest a huge loss would have occurred with the 2007 storm, where thousands of acres of forest were blown down.



CITY OF ABERDEEN FOREST MANAGEMENT PLAN

Prepared 2018 by

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Scope and Purpose

The purpose of this plan is to provide the City of Aberdeen with a summary of current forestland resources, current resource conditions and recommended management practices. This plan is intended to be flexible and serve as a living document and tool to guide the implementation and attainment of resource objectives into the future. Inventory and analysis conducted as part of this plan has been done so with the purpose of providing a baseline of information for the development of a plan of action. More in-depth examination of select resources outside the scope and purpose of this plan may be required and recommended as part of ongoing and future management of the property.

This plan aims to:

- Provide an update as to current forest conditions and future management needs and opportunities to help meet forestland objectives.
- Provide a “road map” for management activities to be implemented by City staff and their designated consultants into the future.
- Educate and inform staff on issues relating to forestry and forestland management, operating and maintenance procedures, and best management practices.
- Serve as a mechanism for information sharing for City staff as well as with consultants, contractors or anyone performing work on the City of Aberdeen owned forestlands.

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MANAGEMENT GOALS & OBJECTIVES

Goals

The management goals of the City of Aberdeen include timber production and revenue, long-term sustainability, and healthy forest conditions. The City Forest shall be intensively managed to maximize wood fiber production and optimize revenue returns while ensuring the protection of ecosystem services such as clean air, clean water and wildlife habitat. Quality silvicultural operations, including density management, vegetation control and others, will ensure full stocking, rapid tree growth and production of high quality wood products. Adherence to rules and regulations of the Washington Forest Practices Act will ensure continued good water quality and quantity as well as fish and wildlife habitat.

The City Forest, specifically the Wishkah Watershed Management Block, provides current and future water supply sources for the City. Additional management considerations including seasonal logging and haul restrictions, low-impact operations, restrictions on herbicide use and access control have been implemented to ensure the protection of water quality and quantity within this area.

Objectives

- 1) Identify an area eligible for an upcoming timber sale. Work with a consultant to prepare a timber sale for 2018/2019.
- 2) Identify and prioritize intermediate stand management activities.
- 3) Create the City's Road Maintenance and Abandonment Plan (RMAP)
- 4) Develop the framework for a Timber Harvest Plan that will identify and prioritize the harvest of stands that contain oversized timber.
- 5) Identify an area for the City of Aberdeen Sewage Soils Disposal Program

INTRODUCTORY OVERVIEW OF THE PROPERTY

General Property Description

The City of Aberdeen owns and manages approximately 2,588 acres of non-contiguous forestland ranging in location from the upper reaches of the Wishkah River Watershed in the north to Charley Creek in the south. The bulk of the ownership occurs within and around the headwaters of the Wishkah River approximately 20 miles north, northeast of Aberdeen City proper. The second largest tract is located at Lake Aberdeen approximately 3 ½ miles east of Aberdeen along U.S. Highway 12. The remainder of the ownership consists of smaller properties located within and around the Aberdeen, Hoquiam, Montesano vicinity. In total, the City of Aberdeen ownership is comprised of 8 separate tracts or *management blocks* based on their location:

<i>Management Block</i>	<i>Acreage Forested</i>	<i>Legal Description (abbr.)</i>
Wishkah Watershed	1405	Portion of Sec. 21, 26, 28, 33, 34, T21N R08W
Lake Aberdeen	649	Portion of Sec. 01, 12, T17N R09W Portion of Sec. 06, T17N R08W
Wynoochee Headworks	174	Portion of Sec. 28, T18N R08W
Charley Creek	98	Portion of Sec. 20, 21, T17N R09W
City West Highlands	80	Portion of Sec. 06, T17N R09W
Stewart Park	77	Portion of Sec. 33, T18N R09W
City Reservoirs	58	Portion of Sec. 05, T17N R09W
Aberdeen Filter Plant	47	Portion of Sec. 23, 24, T19N R09W



Forestland Management Blocks City of Aberdeen



Management Block	
Aberdeen Filter Plant	
Charley Creek	
City Reservoirs	
City West Highlands	
Lake Aberdeen	
Stewart Park	
Wishkah Watershed	
Wynoochee Headworks	

City of Aberdeen
200 E Market
Aberdeen, WA 98520

0 5 10 Miles



Disclaimer: This is not intended as legal representation of property boundaries and is provided for information purposes only.

Highly productive soils coupled with considerable annual rainfall support excellent tree growth throughout the City Forest. In general, these are productive sites composed primarily of well-drained rolling hilltops and Site Class II. The City Forest contains a range of forest cover types and age classes, soil types and subsequent productivity, terrain and topography as well as aquatic sites including streams, wetlands and open water. In general, timber types consist largely of even-aged Douglas-fir and western hemlock plantations, scattered hardwood stands and areas of mixed hardwood and conifer species. Terrain ranges from stream adjacent flat lowlands to rolling foothills and areas of relatively steep hills and valleys. Elevation ranges from near sea level at Charley Creek to 1100 feet above sea level at its highest point within the Wishkah Watershed Management Block.

The City Forest contains a variety of aquatic sites associated with fish bearing streams, small non-fish bearing perennial and seasonal streams, lakes, wetlands and shorelines of the state. A history of careful management including active steps to ensure full stocking and adequate vegetative buffering along water features has resulted in favorable water quality conditions and aquatic habitat throughout the ownership. The City of Aberdeen derives its water supply from the Wishkah River. A dam and intake structure located on the river collects and gravity feeds water via an underground pipe to a filter plant located near the town of Wishkah, approximately 10 miles north of Aberdeen. Water is filtered through a membrane filter system before continuing on to several holding tanks within city limits. The City of Aberdeen owns and operates an industrial water intake located on the Wynoochee River approximately 4 miles north of U.S. Hwy 12. Water from the Wynoochee River is collected and piped to Aberdeen via Lake Aberdeen.

Access onto and within the City Forest varies depending upon location. The majority of the forestland occurs behind locked gates with little or no public access. Vehicle access is designated primarily for city personnel for management and maintenance needs. Access is gained by a combination of city owned and managed forest roads as well as travel through adjoining landowner property. Access within the property is provided, in most cases, by an existing forest road system maintained by the City.

Climate/Weather

As with much of Western Washington, the climate of this region is influenced heavily by the Pacific Ocean, terrain and the semi-permanent high and low-pressure regions located over the North Pacific Ocean. In spring and summer, high pressure systems dominate the North Pacific Ocean causing air to rotate in a clockwise fashion resulting in prevailing winds from the northwest. In fall and winter, low pressure systems take over the North Pacific resulting in a counter clockwise flow of air and prevailing winds primarily from the southwest. These prevailing winds shape the climate of this region. In general, temperate conditions result in relatively cool, dry summers and mild, wet winters.

Due to its location close to the coast, the area receives the full force of severe storms moving inland from over the ocean and therefore, can receive heavy precipitation and winds of gale force during the winter season. The last large-scale wind event was the “Great Coastal Gale of 2007”. This long duration wind event produced hurricane force winds in excess of 120 mph, toppling hundreds of acres of trees and brought devastating flooding to the area.

Surrounding Land Uses

Forestland is the dominant cover across the region. Forestland ownership consists of a mixture of state, private, tribal and federal lands. Private forestlands consist of both industrial timberland and non-industrial private forestland (NIPF). Industrial timberlands are devoted primarily to commercial timber production while NIPF properties tend to be managed for a variety of objectives including timber production, recreation, wildlife habitat and aesthetics. Agriculture and urban development also occur primarily within and along the many streams, rivers and lowland areas of the region.

Past Management History

The majority of forests in this region, including those of the City of Aberdeen, have been managed for timber production for many years. Timber harvests followed by both natural and artificial reforestation have been recorded on most, if not all timberlands throughout the City Forest. Past management considerations and decisions have focused primarily on protecting and ensuring future water supply for the city as well as the growing and selling of merchantable timber to produce revenue to the city. Periodic timber harvests have been conducted throughout the past with the most recent occurring within the Wishkah Watershed Management Block in 2014. Within the past 20 years approximately 5 timber sales have been executed on an “as needed” basis. Prompt reforestation and intermediate cultural practices have resulted in favorable stocking rates as well as healthy and vigorous stands within the majority of the ownership.

Surveys & Property Corners

Portions of the City Forest are believed to be surveyed while other areas are unknown. Property corners marked with monuments and property boundaries blazed with paint were observed within portions of the City Forest. The entire Wishkah Watershed which expands across portions of the City Forest, Green Diamond Resource Company, Rayonier and Grays Harbor County owned forestlands is blazed with yellow paint.

FOREST RESOURCE INFORMATION & INVENTORY

FOREST HEALTH

Factors affecting forest health are common throughout the region. Factors may be biotic or abiotic in nature and include forest insects, disease, drought, weather events, soil erosion and degradation, invasive species, habitat loss/fragmentation or any other condition that may contribute to an identified forest health concern. In general, most factors affecting forest health are natural components of the forest ecosystem, and at low levels do not significantly impact the health of the forest. Tree mortality at some level is essential for creating diversity, forest resiliency and wildlife habitat. However, an imbalance in factors affecting forest health may negatively impact an otherwise healthy system. Such instances may require assistance and manipulation to begin a path toward a more desirable condition.

The overall forest health condition and tree vigor across the City Forest is good. Trees of good color and vigor were observed throughout the property. Active steps to ensure vegetative buffering on stream and wetland areas have resulted in favorable water quality and quantity. Habitat features including large standing snags, areas of diverse understory vegetation, a variety of fruiting shrubs and trees as well as small openings and thicker cover provide habitat for many species of birds and mammals. The primary forest health concerns observed during the development of this plan include overstocking and wind damage.

Stocking and Stand Density

Overstocking is one of the more common forest health concerns within the region. For any forested site, growth potential is based on a finite amount of water, nutrients and light which limit the total volume of wood fiber a stand will produce within a given rotation. As trees grow they eventually occupy all the growing space and begin to compete amongst each other for these essential resources. Competition among trees can slow diameter growth resulting in tall, skinny trees and an increased risk of wind damage. Overstocked stands can also lead to other forest health issues including increased stress and susceptibility to forest insects and disease.

Thinning is generally a recommended treatment for overstocked stands. Pre-commercial thinning (PCT) is a thinning method performed prior to trees reaching merchantable size. The objective of PCT is to release retained trees in overstocked stands by reducing densities to prevent stagnation and increase the growth of the remaining trees. Thinning increases the size of individual trees through the redistribution and concentration of a site's growth potential. Thinning does not increase total wood fiber but rather increases the usable fiber a stand produces by channeling the water, nutrients and light into fewer trees. This results in fewer, yet larger more valuable logs rather than an abundance of small less valuable logs. Thinning has a host of other beneficial effects as well including an increase tolerance to environmental pressures, improved wildlife habitat and a reduction in wildfire threat.

Thinning, however, is not applicable in all situations and stand conditions. For any thinning, there is a certain level of risk associated primarily with wind damage to residual trees. Severely overstocked stands lacking sufficient height to diameter ratios (H/D) are at most risk and should be inventoried thoroughly in order to determine if thinning is an applicable management tool for the site.

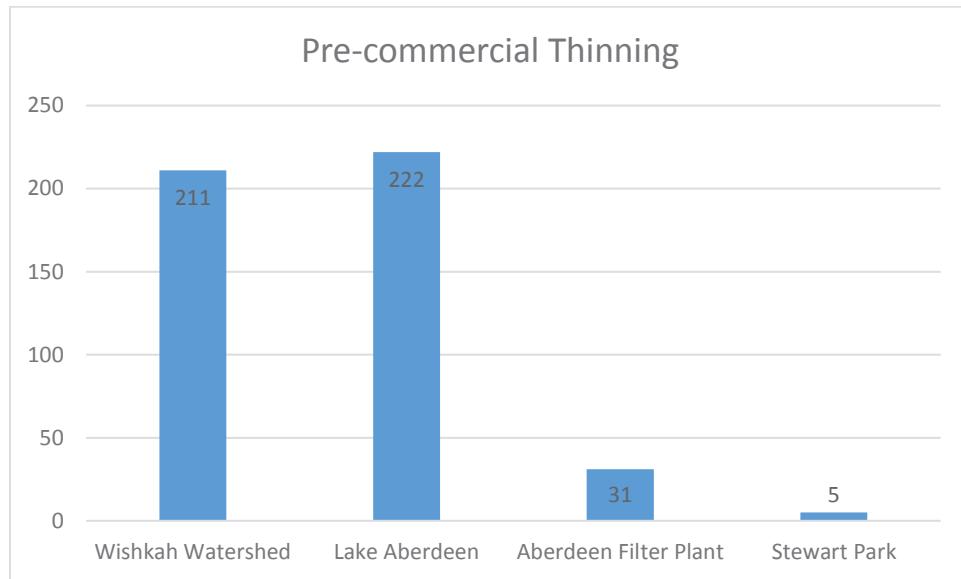


Figure 1. Estimated # of acres requiring PCT on the City Forest within the next 5 yrs.

Insects & Disease

Forest insects and disease are naturally occurring “agents of change” that have co-evolved with their hosts and therefore, are common occurrences within many forest ecosystems. These “disturbance agents” generally increase ecosystem diversity by selectively killing susceptible host species thus providing growing space for less susceptible tree and shrub species. Common tree diseases of the region include Laminated Root Rot, Armillaria Root Disease, Annosus Root Disease, Red Ring Rot or White speck and Swiss Needle Cast. Common forest insects identified within the region include Douglas-fir Beetle, Douglas-fir Engraver Beetle, Douglas-fir Pole Beetle and the White Pine Tip Weevil on Spruce.

Infected trees fall and create stand openings and increase both vertical and horizontal stand structure, therefore, for some landowners a “no-treatment” approach may be taken. Within intensively managed forests, however, insects and disease can pose a major challenge to regeneration and production. Because forest insects and disease are strongly associated with trees under stress, enhancing tree/stand vigor is the best management approach to prevent an infection/attack.

No major instances of insects and/or disease affecting tree growth were observed during the development of this plan. Minor occurrences of root disease were noted within portions of the Wishkah Watershed management block, however, levels are well within the norm of the ecology of the region.

Abiotic Factors & Animal Damage

Forest health can be affected by abiotic or non-living factors. Common abiotic factors affecting forest health include snow and ice damage, drought, frost damage, excessive soil moisture/flooding and wind. Without question, semi-frequent wind events are the most common large-scale abiotic factor affecting forest health. The most recent large-scale wind event was the “Great Coastal Gale of 2007”. This long duration wind event produced hurricane force winds in excess of 120 mph, toppling hundreds of acres of trees and brought devastating flooding to the region. The City Forest experienced areas of considerable wind damage. Mature and sub mature stands within the Lake Aberdeen and Wishkah Watershed management blocks were most severely affected. A combination of overstocking and exposure resulted in several acres of windthrown and damaged trees within each management block. Currently these areas are composed of a combination of naturally regenerating western hemlock and brush species. Controlling tree density to ensure appropriate spacing and healthy trees with adequate H/D ratios will help reduce the incidence of wind damage in these areas.

A variety of animals live and utilize the forested environment. Many of these animals can cause anywhere from limited to significant damage. Trees which experience the most significant impact are young trees, ranging from newly planted to approximately 30-35 years of age. Some of the more common damage issues associated with trees include browse damage to young seedlings, antler rub damage to young pole size trees, porcupine and/or bear damage to tree boles.

Invasive Species

Invasive exotic species of plants threaten ecosystems by out-competing native plants, replacing native forage, reducing biodiversity and degrading fish and wildlife habitat. Within the forest, invasive species can be a major competitor to young seedlings. Commonly controlled invasive species affecting forestland within the region include Himalayan blackberry, cutleaf blackberry, scotch broom, knotweed and reed canary grass.

Wildfire

Normally, the risk of wildfire across Western Washington is relatively low in comparison to Eastern Washington. High average humidity along with a significant amount of annual rainfall put this region at low risk for wildfire. However, over the last several years, Western Washington has experienced above average drought conditions increasing the potential for a severe wildfire. An easterly flow can significantly lower humidity, creating very dry conditions and increasing the potential for a severe wildfire. An abundance of young plantations, thick

understory vegetation, overstocked stands, and forest fuels common of Western Washington also add to this risk.

Management Recommendations

- Practice good silviculture.
 - Evaluate forest stands for signs of tree competition and overstocking. Insect and disease agents are more prevalent in stagnated and stressed trees, therefore, many of the above mentioned forest health concerns can be avoided simply by managing density (i.e. thinning).
- Address insects and disease.
 - Monitor property for forest insects and disease and evaluate if management action is necessary.
- Control invasive species.
 - Monitor property for invasive exotic species of plants and evaluate if management action is necessary.
- Maintain up-to-date fire emergency contact information
 - Washington DNR Forest Fire Reporting (800) 562-6010

SOILS

Soils of the City Forest are derived from a unique history of geologic activity and include several distinct geologic regions. Parent material ranges from marine volcanic and sedimentary rock to areas of glacial deposition. Understanding soil type and structure plays an important role in management of the property. Characteristics of the soil that may affect management activities include productivity/site index, erosion potential, compaction resistance, water depth to restrictive layer, wetness, seasonal flooding and drought potential. Management implications related to soil characteristics may include soil suitability for roads and trails, equipment operability as well as tree species selection.

Soils of the City Forest range from highly productive well-drained rolling hilltops to lessor areas of low-lying hydric soils associated with water tolerant species. All soils within the ownership are susceptible to compaction if operated on during wet and saturated conditions. Soil type and landform features can also combine to create potentially unstable slopes increasing the risk of mass wasting especially after timber harvest. Harvest units should be evaluated prior to timber harvest in an effort to identify potentially unstable slopes.

Soil surveys are designed to provide information about the properties of the soils in the survey area to help in land use planning and management. Soils data provides information on how to avoid soil erosion, rutting, compaction and other damage that can cause water pollution and reduce the long-term health and productivity of the forest. According to the most recent soil survey, approximately 31 different soil map units have been identified across the City Forest. Of these, four account for nearly 75 percent of the ownership: Copalis silt loam (30-65% slope), Le Bar lilt loam (30-65% slope), Lytell silt loam (30-65% slope), Zenker silt loam (30-65% slope) and Zyzyl gravelly loam (30-65% slope). Refer to Soils Maps for soil location information. For additional soils information, refer to <https://websoilsurvey.sc.egov.usda.gov>.

Copalis silt loam (30-65% slope)

This soil series is typically found on slopes ranging from 30-65 percent and at an elevation ranging from 100-980 feet. The parent material consists of glacial drift. Landforms associated with these soils are typically terraces. Soils of this type are typically found in areas with a mean annual precipitation of 80-140 inches and a mean annual air temperature of 50 degrees F. This is a well drained soil with a depth to restrictive feature of more than 80 inches. Available water capacity of this soil is moderate at about 6.7 inches. The typical soil profile of Copalis silt loam (30-65% slope) consists of medial silt loam from 0-11 inches, 11-26 inches and 26-38 inches and cemented material from 38-60 inches..

This soil series has a *moderate resistance* to soil compaction, meaning the soil has one or more features that favor the formation of a compacted layer, especially if logging occurs during moist to wet soil conditions. Soil compaction tends to reduce water infiltration which affects plant production and composition and increases runoff which generally increases erosion rates. This soil has a *low* potential for seedling mortality based on flooding, depth to water table, available

water capacity, soil moisture and temperature regime, aspect and slope. This soil is considered *unsuited* for mechanical site preparation due to slope. Rutting hazard of this soil is *severe*, meaning ruts form readily. This soil is considered *poorly suited* for roads as low strength can often result in an increased potential for erosion. Forest road construction on this soil may require special design, extra maintenance and costly alteration.

Le Bar silt loam (30-65% slope)

This soil series is typically found on slopes ranging from 30-65 percent and at an elevation ranging from 300-1,180 feet. The parent material consists of old alluvium. Landforms associated with these soils are typically terraces. Soils of this type are typically found in areas with a mean annual precipitation of 80-120 inches and a mean annual air temperature of 50 degrees F. This is a well drained soil with a depth to restrictive feature of more than 80 inches. Available water capacity of this soil is high at about 11.9 inches. The typical soil profile of Le Bar silt loam (30-65% slope) consists of medial silt loam from 0-12 inches, 12-22 inches and 22-60 inches.

This soil series has a *moderate resistance* to soil compaction, meaning the soil has one or more features that favor the formation of a compacted layer, especially if logging occurs during moist to wet soil conditions. Soil compaction tends to reduce water infiltration which affects plant production and composition and increases runoff which generally increases erosion rates. This soil has a *moderate* potential for seedling mortality based on soil reaction, soil moisture and temperature regime, aspect and slope. This soil is considered *unsuited* for mechanical site preparation due to slope. Rutting hazard of this soil is *severe*, meaning ruts form readily. This soil is considered *poorly suited* for roads as low strength can often result in an increased potential for erosion. Forest road construction on this soil may require special design, extra maintenance and costly alteration.

Lytell silt loam (30-65% slope)

This soil series is typically found on slopes ranging from 30-65 percent and at an elevation ranging from 0-1,700 feet. The parent material consists of colluvium derived from sandstone and siltstone. Landforms associated with these soils are typically slumps. Soils of this type are typically found in areas with a mean annual precipitation of 70-125 inches and a mean annual air temperature of 48-50 degrees F. This is a well drained soil with a depth to restrictive feature of more than 80 inches. Available water capacity of this soil is high at about 10.3 inches. The typical soil profile of Lytell silt loam (30-65% slope) consists of medial silt loam from 0-10 inches, medial silty clay loam from 10-16 inches, medial silty clay loam from 16-50 inches and weathered bedrock from 50-60 inches.

This soil series has a *moderate resistance* to soil compaction, meaning the soil has one or more features that favor the formation of a compacted layer, especially if logging occurs during moist to wet soil conditions. Soil compaction tends to reduce water infiltration which affects plant production and composition and increases runoff which generally increases erosion rates. This soil has a *low* potential for seedling mortality. This soil is considered *unsuited* for mechanical site preparation due to slope. Rutting hazard of this soil is *severe*, meaning ruts form readily. This soil is considered *poorly suited* for roads as low strength can often result in an increased

potential for erosion. Forest road construction on this soil may require special design, extra maintenance and costly alteration.

Zenker silt loam (30-65% slope)

This soil series is typically found on slopes ranging from 30-65 percent and at an elevation ranging from 50-980 feet. The parent material consists of colluvium derived from sandstone. Landforms associated with these soils are typically hills. Soils of this type are typically found in areas with a mean annual precipitation of 70-110 inches and a mean annual air temperature of 46-50 degrees F. This is a well drained soil with a depth to restrictive feature of more than 80 inches. Available water capacity of this soil is high at about 10.5 inches. The typical soil profile of Zenker silt loam (30-65% slope) consists of medial silt loam from 0-11 inches, medial silt loam from 11-17 inches and medial loam from 17-60 inches.

This soil series has a *moderate resistance* to soil compaction, meaning the soil has one or more features that favor the formation of a compacted layer, especially if logging occurs during moist to wet soil conditions. Soil compaction tends to reduce water infiltration which affects plant production and composition and increases runoff which generally increases erosion rates. This soil has a *low* potential for seedling mortality. This soil is considered *unsuited* for mechanical site preparation due to slope. Rutting hazard of this soil is *severe*, meaning ruts form readily. This soil is considered *poorly suited* for roads as low strength can often result in an increased potential for erosion. Forest road construction on this soil may require special design, extra maintenance and costly alteration.

Zyzyl gravelly loam (30-65% slope)

This soil series is typically found on slopes ranging from 30-65 percent and at an elevation ranging from 600-1,800 feet. The parent material consists of colluvium and residuum derived from marine basalt. Landforms associated with these soils are typically mountains. Soils of this type are typically found in areas with a mean annual precipitation of 120-180 inches and a mean annual air temperature of 48-50 degrees F. This is a well drained soil with a depth to restrictive feature of more than 80 inches. Available water capacity of this soil is low at about 5.4 inches. The typical soil profile of Zyzyl gravelly loam (30-65% slope) consists of gravelly medial loam from 0-9 inches, gravelly medial sandy loam from 9-39 inches, gravelly medial sandy loam from 39-45 inches and weathered bedrock from 45-49 inches.

This soil series has a *moderate resistance* to soil compaction, meaning the soil has one or more features that favor the formation of a compacted layer, especially if logging occurs during moist to wet soil conditions. Soil compaction tends to reduce water infiltration which affects plant production and composition and increases runoff which generally increases erosion rates. This soil has a *low* potential for seedling mortality. This soil is considered *unsuited* for mechanical site preparation due to slope. Rutting hazard of this soil is *slight*, meaning ruts may form readily. This soil is considered *poorly suited* for roads as low strength can often result in an increased potential for erosion. Forest road construction on this soil may require special design, extra maintenance and costly alteration.

Site Index

Tree Site Index is a measure of site productivity and is defined as the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. Site Class is a specific grouping of Site Index values. The lower the Site Class the higher the Site Index values and subsequent productivity. Higher Site Index values mean greater soil productivity and faster tree growth. Higher Site Index often means forest management activities may occur sooner in comparison with less productive sites.

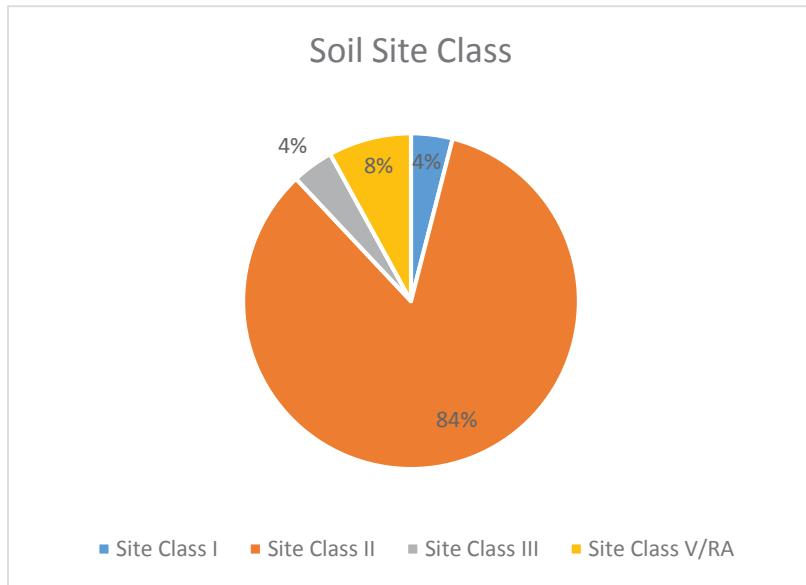


Figure 2. *Distribution of Site Class, City Forest*

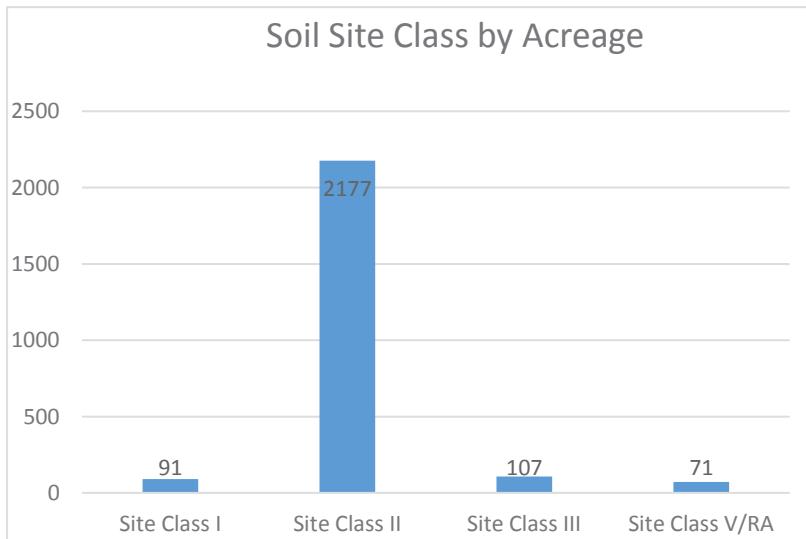


Figure 3. *Distribution of Site Class by acreage, City Forest*

Management Recommendations

- Limit compaction/soil disturbance.
 - Schedule forest operations requiring heavy equipment for seasonally dry periods in order to avoid rutting, soil compaction, erosion and damage to tree roots, especially within the Wishkah Watershed management block.
- Monitor roads and open spaces annually for erosion and rutting and treat accordingly.

WATER QUALITY/RIPARIAN AND FISH HABITAT/WETLANDS

**A detailed stream/wetland classification should be conducted prior to any forest activities which require a DNR-approved Forest Practices Application.*

The City Forest occurs within the lower reaches of the Chehalis River Watershed. With the exception of the Columbia River, the Chehalis River Watershed is the largest river watershed in Washington covering an area of approximately 2,613 square miles. The Chehalis River Watershed contains several major river systems and 11 watershed sub-basins. The City Forest occurs within the Hoquiam/Wishkah, Wynoochee, and the South Harbor Sub-basins.

According to the Washington State Dept. of Natural Resources and data collected during the development of this plan, the City Forest contains an estimated combined 26.2 stream miles composed of Type S (Shorelines), Type F (Fish Bearing), and Type N (Non-Fish Bearing) waters. Type S and F waters consist primarily of larger, low-lying perennial stream systems while Type N waters tend to be characterized as small, low-flow headwater or transport reaches.

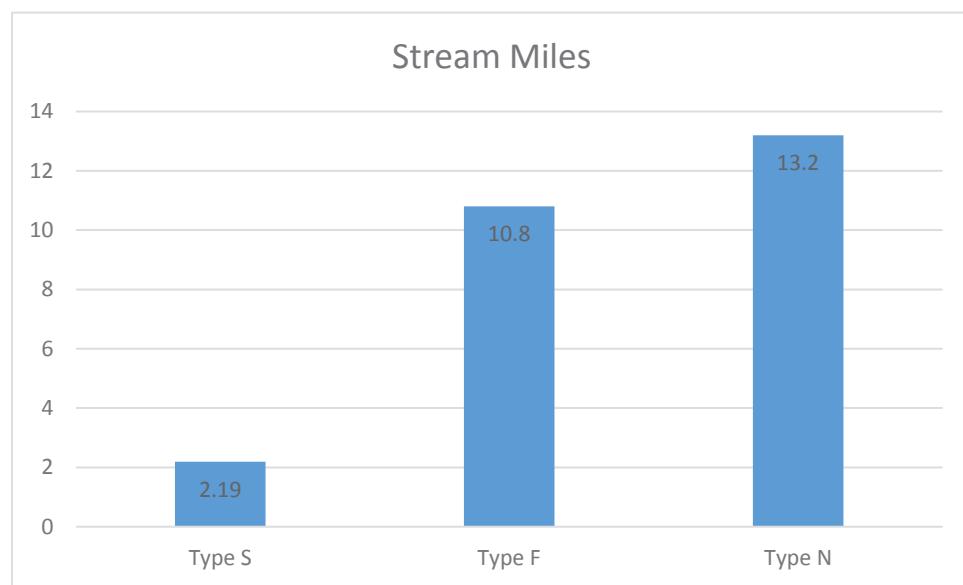


Figure 4. Total stream miles, City Forest

The City Forest contains an abundance of aquatic sites including lakes, streams, rivers and wetlands. In general, water quality and aquatic habitat is good. Vegetative buffers as well as upgrades and maintenance to the forest road system have resulted in improved water quality and habitat conditions throughout the property. Retention/protection of forest riparian areas associated with water features large and small improves water quality, water quantity and fish habitat by providing 1) protection from streambank erosion 2) thermal buffering to help stabilize water temperature 3) introduction of large woody debris and leaf litter for fish habitat complexity 4) upland wildlife habitat in the form of food and cover 5) and a means to filter and

recycle runoff and trap soil particles before they enter open water. Stream adjacent forest riparian cover within the City Forest varies depending upon stream segment, however, in general, riparian areas tend to be well vegetated with a diverse mix of tree, shrub and herbaceous species. Both hardwood and conifer species including red alder, black cottonwood, willow, western red cedar, Sitka spruce, Douglas-fir and western hemlock occupy these areas. According to the Washington State Dept. of Fish and Wildlife, documented salmonid species within waters of the City Forest include fall, spring and summer Chinook; Coho; fall chum; cutthroat trout; and summer and winter steelhead.

Management Recommendations

- ⊕ Follow Forest Practices Rules & Best Management Practices (BMPs).
 - Adequately buffer streams in accordance with Forest Practices Rules and regulations.
 - Avoid the use of heavy equipment in and around riparian areas or on saturated soils in an effort to reduce erosion and sediment delivery.
 - Monitor roads and open spaces for erosion and sedimentation and treat accordingly.

FOREST INVENTORY/TIMBER/WOOD PRODUCTS

The City Forest consists of approximately 2,588 acres of non-contiguous forestland delineated into 8 separate management blocks. Within the ownership, roads, riparian/wetland buffers and potentially unstable slope areas account for estimated 570 acres. The estimated total production land base of the City Forest is 2,018 acres or 78%.

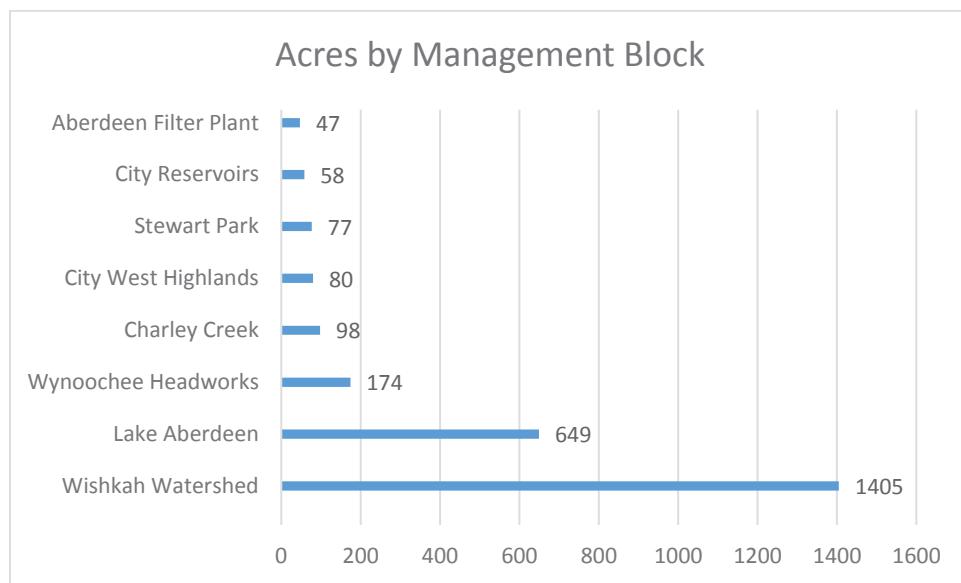


Figure 5. Total acres by Management Block, City Forest

Timber types across the City Forest consist largely of plantation stands of Douglas-fir and western hemlock. Lessor areas composed primarily of hardwoods and/or mixed hardwood and conifer species are also present. The City Forest contains a range of growing conditions including changes in terrain, elevation, topography, soils, and precipitation. Most if not all of the ownership is considered highly productive forestland. Stands are generally well stocked with trees of good color and vigor, however, areas of overstocking, stagnation and wind damage were observed. Age classes range from newly established to large mature second growth timber in excess of 70 years of age. The Wishkah Watershed management block contains the oldest and largest volume of timber within the ownership. The majority of trees within this area range in age from 61-80 years. In contrast, the Lake Aberdeen management block contains largely sub-mature stands ranging in age from 11-30 years.

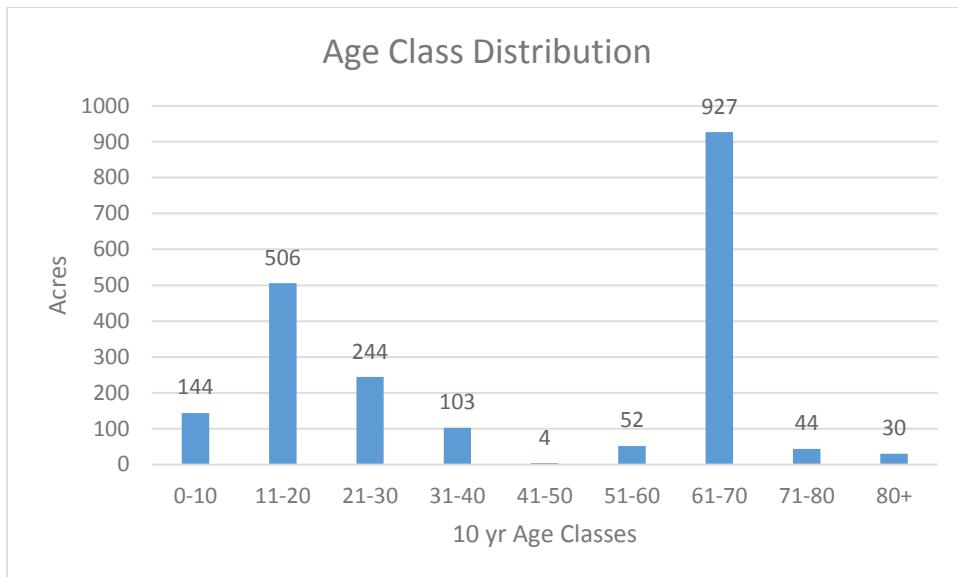


Figure 6. *Age Class Distribution, City Forest*

For management purposes, each management block has been delineated into distinguishable units or stands based on uniform age-class, species composition and/or structure. Stand delineation may also be based on past management activities such as previous harvest units or proposed activities. *Stands should be interpreted as suggested delineations which can be changed depending upon future management needs.* A total of 39 stands have been recorded across the 8 management blocks.

The following forest inventory contains three parts:

- 1. General description of the management block**
- 2. Brief description and inventory summary for each stand**
- 3. Management block recommendations**

Wishkah Watershed

The Wishkah Watershed management block consists of 1,405 acres located within the upper reaches of the Wishkah River watershed approximately 20 miles north, northeast of Aberdeen. The Wishkah Watershed management block accounts for nearly 54 percent of the total ownership. A dam, pond and intake structure are located within the southwest corner of the property. Primary access is provided by the Wishkah Road as well as the Green Diamond 7425, a main haul route connecting the Wynoochee and Wishkah drainages. Access within the property is somewhat limited. This area has been relatively unmanaged and therefore is largely inaccessible. However, a series of old rail grades and spur roads observed throughout the property may serve as access points for future road construction. Adjoining lands are owned and operated by Green Diamond Resource Company, Rayonier Timberlands, Grays Harbor County and the U.S. Forest Service. Timber types consist primarily of large mature second growth Douglas-fir and western hemlock. The Wishkah Watershed management block contains riparian areas associated with Type S, Type F and Type N watercourses. Understory vegetation throughout the Wishkah Watershed Management Block is plentiful and consists of a mixture of small tree, shrub and herbaceous species including sword fern, salal, cascara, salmonberry, red huckleberry and vine maple.

Approximately 71% or 1000 acres of the Wishkah Watershed management block is composed of large second growth timber between the ages of 60-80 years old. An estimated 10% of trees within this area contain diameters equal to or greater than 28". Due to limited mill capacity to process large diameter wood, marketing of large logs has become challenging. With fewer mills buying large logs, prices have trended downward. In addition to marketing challenges, older trees tend to accumulate more decay and defect overtime reducing value. In order to avoid losses associated with a decline in value of large logs as well as expected volume losses in older trees, consider an increase in harvest within this area. Work with a consultant to prioritize harvest of large oversized timber prior to an anticipated decrease in value. A harvest plan should take into consideration the following: location of stands with high percentage of large diameter timber, available access, market conditions and protection of water quality and quantity. Trees, through the process of transpiration, consume large quantities of water. Removal of forest cover can alter hydrologic function until revegetated. In order to ensure protection of water quality and quantity, consider consultation with a hydrologist while developing a harvest plan for this area.

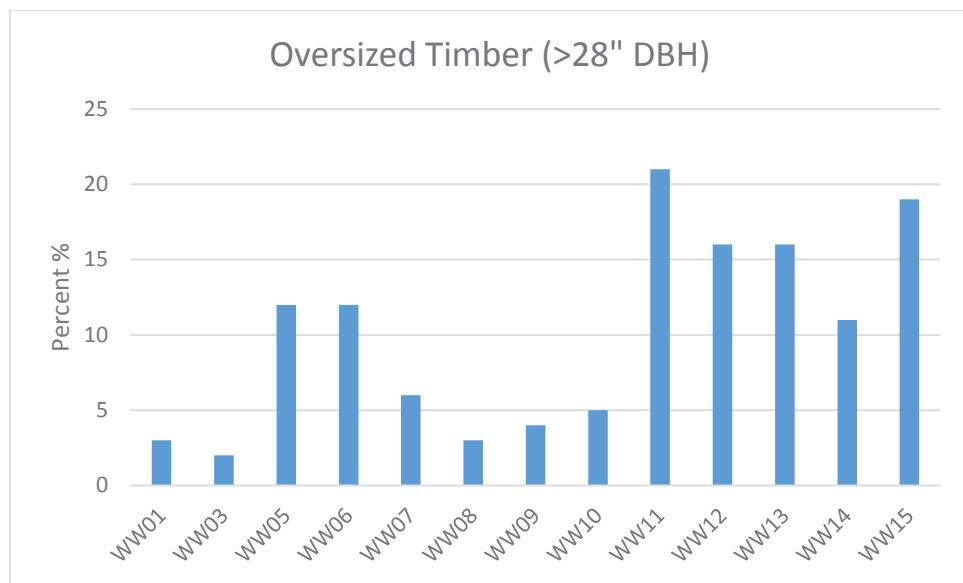


Figure 7. Percent oversized timber by stand, Wishkah Watershed Management Block

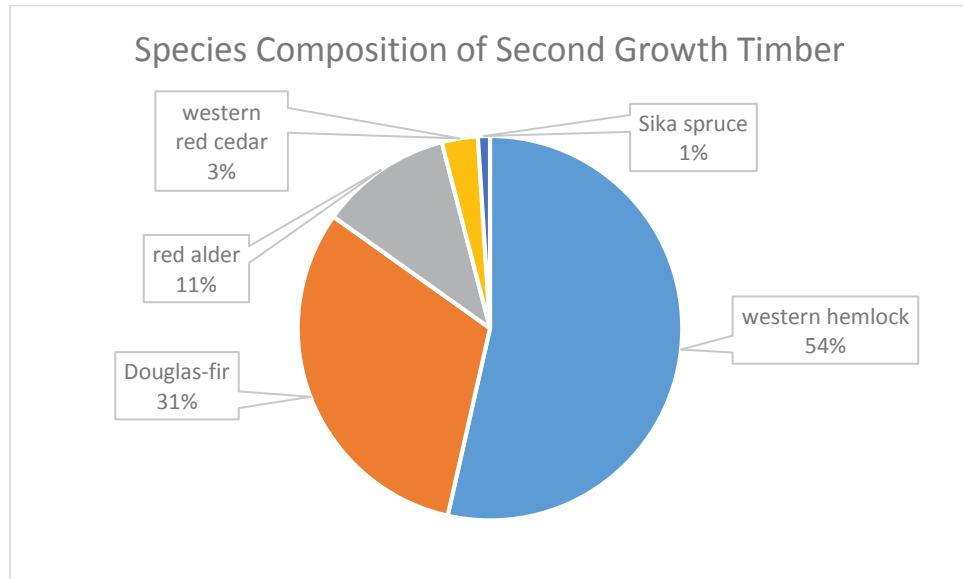
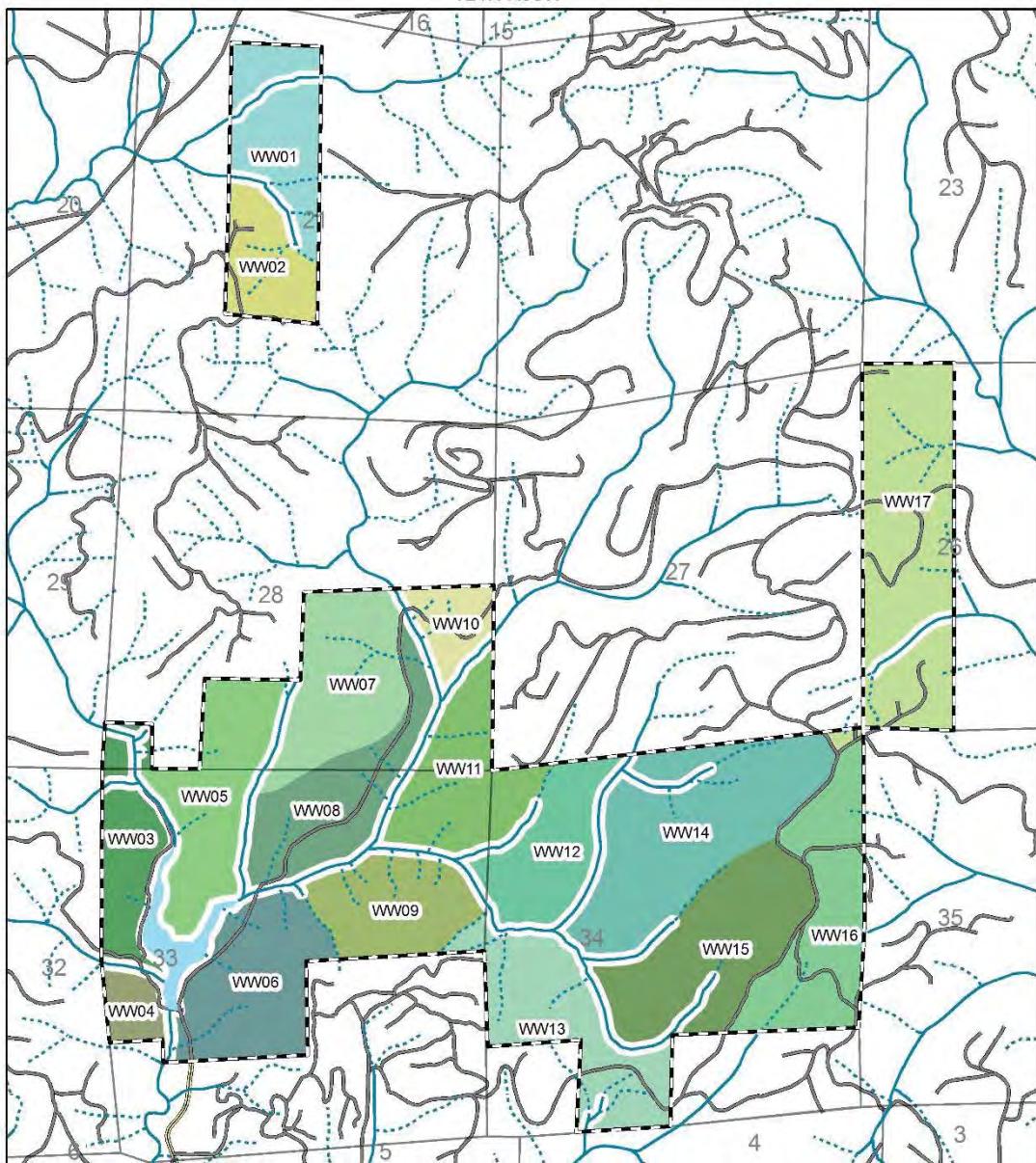


Figure 8. Species composition of second growth timber, Wishkah Watershed Management Block



Forest Stand Map Wishkah Watershed

T21N R08W



Legend

- City of Aberdeen
- Type S & F
- Type N
- Forest Road

0 0.5 1 Miles

City of Aberdeen
200 E Market
Aberdeen, WA 98520



Disclaimer: This is not intended as legal representation of property boundaries and is provided for information purposes only.

WW01

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height
59	61-70	western hemlock, Douglas-fir	235	16"	127'

WW01 consists primarily of large second growth western hemlock and Douglas-fir with scattered pockets of red alder. WW01 contains approximately 235 trees per acre with an average diameter at breast height of 16" and a DBH range of 9-35 inches. Average stand height is 127 feet with a height range of 85-164 feet. Approximately 6 acres of windthrown and wind damaged trees occur within the northwest corner of the stand. A dense stand of western hemlock saplings approximately 10 feet in height now occupy the wind damaged area. Terrain ranges from relatively flat within the northwest portion of the stand to areas of steep slopes in excess of 35% in the southern half. Currently there is no vehicle access to WW01.

WW02

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height	Average LCR
44	11	Douglas-fir, western hemlock	1000	3"	24'	68

WW02 consists of an even-aged Douglas-fir and western hemlock plantation established in 2007. WW02 contains approximately 1000 trees per acre with an average diameter at breast height of 3 inches and a DBH range of 1-6 inches. Average stand height is 24 feet with a height range of 15-35 feet. Average live crown ratio is 68 percent. WW02 has reached crown closure and entered into a stem exclusion stage characterized by reduced live crowns, self pruning and a reduction in understory vegetation.

WW03

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height
44	71-80	western hemlock, Douglas-fir	186	19"	141'

WW03 consists of 44 acres located along the western property boundary. WW03 consists primarily of large second growth western hemlock and Douglas-fir. WW03 contains approximately 186 trees per acre with an average diameter at breast height of 19" and a DBH range of 10-32 inches. Average stand height is 141 feet with a height range of 81-181 feet. Western hemlock and Douglas-fir are the dominant species throughout the stand with a lesser component of Sitka spruce and western red cedar located primarily in the southern third of the stand. WW03 is a steep unit with slopes in excess 40 -50 %. A stream adjacent forest road composed primarily of native material provides access along the east side and base of the unit.

WW04

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height	Average LCR
17	9	western hemlock, Douglas-fir, red alder	1475	2"	11'	100

WW04 consists of an even-aged Douglas-fir plantation established in 2009. Naturally regenerating western hemlock and red alder have established alongside Douglas-fir increasing the overall density. WW04 contains approximately 1475 trees per acre with an average diameter at breast height of 2" and a DBH range of 1-4 inches. Average stand height is 11 feet with a height range of 5-20 feet. Average life crown ratio (LCR) remains at 100%. Overall stocking is adequate with minor stand openings as a result of competing vegetation and unburnt slash. WW04 contains areas of steep and potentially unstable slopes.

WW05

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height
79	61-70	western hemlock, Douglas-fir	121	21"	138'

WW05 consists primarily of large second growth western hemlock and Douglas-fir. WW05 contains approximately 121 trees per acre with an average diameter at breast height of 21 inches and a DBH range of 9-38 inches. Average stand height is 138 feet with a height range of 85-175 feet. Western hemlock and Douglas-fir are the dominant species. Scattered hardwood areas consisting primarily of red alder are also present. Small to medium sized stand openings were observed scattered throughout this stand. Openings are believed to be a result of a

combination root disease and windthrow. Terrain is generally rolling, however slopes in excess of 35% do occur within this area. Currently there are no roads within this unit. Previous access was gained via a rail grade from the east.

WW06

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height
86	61-70	western hemlock, Douglas-fir	136	21"	136'

WW06 occurs along the eastside of the intake pond within the southwest corner of the management block. WW06 consists of a mixture large second growth western hemlock, Douglas-fir and scattered red alder. WW06 contains approximately 136 trees per acre with an average diameter at breast height of 21 inches and a DBH range of 8-38 inches. Average stand height is 136 feet with a height range of 85-176 feet. A component of Port Orford cedar was observed within the northern portion of the stand. Terrain is generally rolling, however, slopes in excess of 35% occur within the upper southeast corner of the stand. Currently there is no vehicle access within WW06.

WW07

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height
83	61-70	Douglas-fir, western hemlock	134	19"	136'

WW07 occurs along the west side of the 8000 road in the southeast quarter of section 28. WW07 is bounded by an old rail grade to the south. WW07 contains a mix of second growth western hemlock, Douglas-fir and scattered red alder. WW07 contains approximately 134 trees per acre with an average diameter at breast height of 19 inches and a DBH range of 8-34 inches. Average stand height is 136 feet with a height range of 92-175 feet. Terrain is variable, generally increasing in slope toward the northwest corner of the stand.

WW08

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height
75	61-70	red alder, western hemlock, Douglas-fir	114	18"	111'

WW08 contains a mix of hardwood and conifer species including red alder, western hemlock and Douglas-fir. WW08 contains approximately 114 trees per acre with an average diameter at breast height of 18 inches and a DBH range of 10-29 inches. Average stand height is 111 feet with a height range of 64-158 feet. Red alder dominates the eastern portion of the stand, east of the 8000 road and along the stream. Scattered stand openings were also noted throughout the stand and believed to result from of a combination of root disease and windthrow. Terrain is generally rolling with slopes in most cases less than 35%. The 8000 road bisects this stand running generally north to south.

WW09

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height
64	61-70	red alder, western hemlock, Douglas-fir, western red cedar	145	16"	121'

WW09 is a diverse area consisting of multiple species, age classes and stocking levels. WW09 contains a mixture of red alder, western red cedar, western hemlock and scattered Douglas-fir. WW09 contains approximately 145 trees per acre with an average diameter at breast height of 16 inches and a DBH range of 10-31 inches. Average stand height is 121 feet with a height range of 63-165 feet. Stocking is highly variable and indicative of a naturally regenerated stand. Ridges, hilltops and benches contain rather dense stands of western hemlock and/or Douglas-fir while slopes and draws tend to be occupied by red alder and western red cedar. WW09 contains slopes in excess of 60%. Several untyped and presumably seasonal streams drain the upland portions of this stand.

WW10

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height
25	61-70	western hemlock, Douglas-fir,	130	19"	119'

WW10 is composed primarily of large second growth western hemlock and Douglas-fir. WW10 contains approximately 130 trees per acre with an average diameter at breast height of 19 inches and a DBH range of 9-37 inches. Average stand height is 119 feet with a height range of 86-143 feet. The 8000 road bisects this stand running generally east to west. This stand contains slopes in excess of 35%.

WW11

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height
72	61-70	western hemlock, Douglas-fir,	124	21"	129"

WW11 consists primarily of large second growth western hemlock and Douglas-fir. WW11 contains approximately 124 trees per acre with an average diameter at breast height of 21 inches and a DBH range of 10-38 inches. Average stand height is 129 feet with a height range of 75-169 feet. Scattered hardwood dominated zones were observed located primarily within draws and along streams. In contrast with neighboring stands, WW11 contains relatively gentle slopes. Currently there is no vehicle access to this stand.

WW12

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height
57	61-70	western hemlock, Douglas-fir,	105	19"	121"

WW12 consists primarily of large second growth western hemlock and Douglas-fir intermixed with scattered pockets of red alder located primarily within the southern half of the unit. WW12 contains approximately 105 trees per acre with an average diameter at breast height of

19 inches and a DBH range of 9-36 inches. Average stand height is 121 feet with a height range of 60-162 feet. Terrain is generally rolling with slopes less than 35%. Currently there is no vehicle access to this stand.

WW13

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height
87	61-70	western hemlock, Douglas-fir,	109	21"	129'

WW13 consists primarily of large second growth western hemlock and Douglas-fir. WW13 contains approximately 109 trees per acre with an average diameter at breast height of 21 inches and a DBH range of 8-43 inches. Average stand height is 129 feet with a height range of 68-173 feet. Stocking levels vary depending upon location within the stand. Both stand openings as well as areas of high density western hemlock were observed throughout this stand. Terrain ranges from relatively flat to areas of steep slopes in excess of 60% within the west northwest portion of the stand. The 7425 bisects the southern extent of WW13 running generally east to west.

WW14

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height
137	61-70	western hemlock, Douglas-fir,	152	18"	118'

WW14 occurs along the west side of the 7400 mainline haul route. WW14 consists primarily of large second growth western hemlock and Douglas-fir. WW14 contains approximately 152 trees per acre with an average diameter at breast height of 18 inches and a DBH range of 8-36 inches. Average stand height is 118 feet with a height range of 60-160 feet. Scattered pockets of red alder were observed located primarily within draws and along the stream. Terrain is generally rolling with slopes equal to or less than 35%. Currently there is no vehicle access, however, old rail grades were observed traversing through this stand.

WW15

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height
103	61-70	western hemlock, Douglas-fir,	115	21"	130'

WW15 consists primarily of large second growth western hemlock and Douglas-fir. WW15 contains approximately 115 trees per acre with an average diameter at breast height of 21 inches and a DBH range of 8-39 inches. Average stand height is 130 feet with a height range of 84-178 feet. Scattered pockets of red alder were observed within draws and along streams. Terrain is generally rolling with slopes less than 35%. Currently there is no vehicle access, however, old rail grades were observed traversing this stand.

WW16

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height
95	4	Douglas-fir	450	1"	4'

WW16 consists of a fully stocked even-aged Douglas-fir plantation established in 2014. WW16 contains approximately 450 trees per acre. Average tree height is 4 feet with a height range of 2-6 feet. Trees are healthy with good color and vigor. The majority of trees are already free-to-grow. Where present competing vegetation includes bracken fern, cutleaf blackberry and salal.

WW17

Total Acres	Age	Dominant Species	Trees per acre	Average DBH	Dominant Height
153	13	Douglas-fir, western hemlock	633	5"	33'

WW17 consists of an even-aged Douglas-fir and western hemlock plantation established in 2005. WW17 contains approximately 633 trees per acre with an average diameter at breast height of 5 inches and a DBH range of 1-10 inches. Average stand height is 33 feet with a height range of 20-50 feet. Average life crown ratio (LCR) is 58%. This stand has reached crown closure and entered into a stem exclusion stage characterized by reduced live crowns, self pruning and

a reduction in understory vegetation. Terrain ranges from gentle slopes and benches to ridges and steep areas with slope in excess of 60%. An existing forest road system constructed during previous harvest operations provides adequate access throughout this stand.

Management Recommendations

Location (Stand ID)	Practice/Activity	Year	Extent (acres)	Comments
WW01 WW03 WW05- WW15	Work with a consulting forester to prioritize harvest of large oversized timber prior to an anticipated decrease in value. A harvest plan should take into consideration the following: location of stands with high percentage of large diameter timber, available access, market conditions and protection of water quality and quantity.	2018-On	1000	Trees, through the process of transpiration, consume large quantities of water. Removal of forest cover can alter hydrologic function until revegetated. In order to ensure protection of water quality and quantity, consider consultation with a hydrologist while developing a harvest plan for this area.
WW02 WW04 WW17	Pre-commercial thin prior to live crowns receding beyond 40 percent. Thin to a spacing of approximately 12-13 feet or 258-302 trees per acre.	2018-2023	214	Thin from below extracting the most suppressed and defective trees.
WW16	Evaluate stand for pre-commercial thinning.	2024-2029	95	

PROPERTY ACCESS/ FOREST ROADS

Forest roads are an important component to a well-managed forest. Properly constructed and maintained roads ensure future access, reduce long-term costs, help minimize soil erosion and protect forest productivity, water quality and fish/wildlife habitat. Forest roads and transportation systems are typically the single most expensive capital cost within a working forest. Forest roads are also known point sources for erosion and sediment delivery. Therefore, regular maintenance to the forest road system is critical to the management and resource protection of the property. Common road maintenance plans may include grading and resurfacing, clearing ditches and culverts, repairs from wash-outs or slides, roadside vegetation control (daylighting) and seeding of exposed soils.

The City Forest contains a network of forest roads that provide access for forest management activities as well as Water Department operations. The City Forest contains an estimated 14.5 total road miles including 44 culverts and two bridges. The forest road system features a combination of year-round haul roads, seasonal-use roads, connecting spurs, stream adjacent, mid-slope and ridgeline roads. Existing roads are generally well rocked and in good condition, however, overall access is limited. The City Forest contains large roadless areas requiring a combination of new road construction and/or travel through adjoining landowner property to gain access.

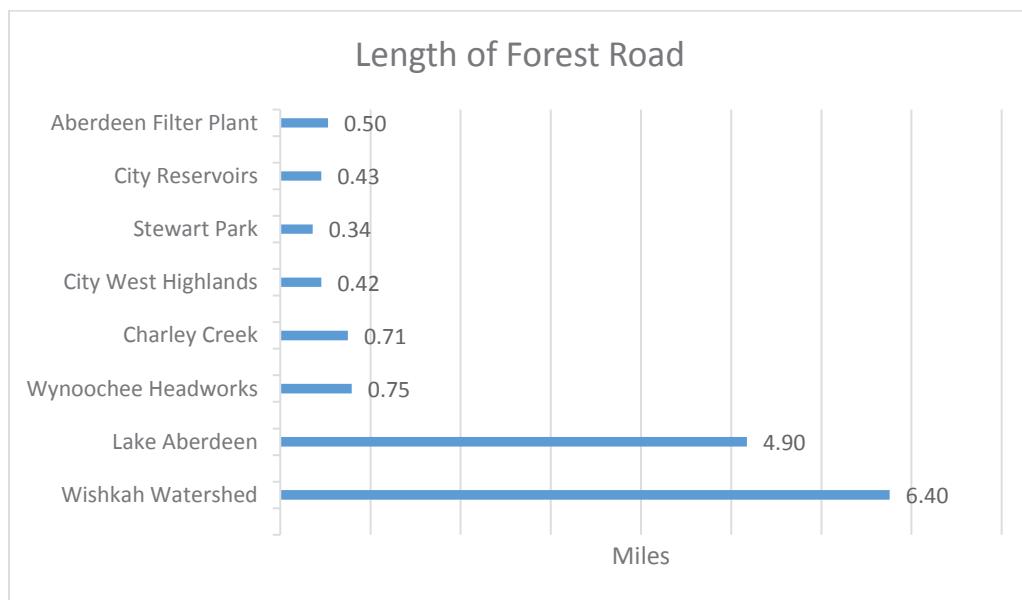


Figure 9. Length of forest road by management block, City Forest

Road Maintenance and Abandonment Plan

All forest roads on state and private lands are required to meet forest road construction, maintenance and abandonment standards adopted in the 2001 Forest Practices Rules and Regulations. Forest roads that meet RMAP standards and state regulated Best Management Practices (BMP) follow a plan that addresses a variety of maintenance checks and needs to ensure protection of public resources including water quality, quantity and wildlife habitat. Common upgrades include replacing stream crossing structures that allow for fish passage, drainage and relief culvert installation, improved road surfacing and/or road abandonment. RMAP requirements, however, vary if the timber owner is a small forest landowner.

Small Forest Landowner

RCW 76.09.450 defines a small forest landowner as an owner of forestland who has harvested less than two million board feet of timber per year during the previous three years. Small forest landowners are required to submit a road maintenance and abandonment checklist (Checklist RMAP) on roads actively being used for forest practices activities. The Checklist RMAP identifies and requires necessary upgrades solely on roads being used by the proposed activities. The City of Aberdeen currently meets the definition of a small forest landowner per RCW 76.09.450. However, as harvest volumes are predicted to increase, the City will transition into large landowner status thus requiring an RMAP for the entire ownership.

Current Condition

In general, existing roads are composed of compacted rock and in good working condition. Frequently used and newly constructed roads contain drainage features including ditch relief and extension culverts, waterbars and sediment traps designed to control water and prevent road damage and sedimentation. Efforts to control encroaching roadside vegetation were observed within portions of the ownership. Roadside clearing should be included in an annual maintenance plan as daylighting roads can help reduce the incidence of ponding water and erosion of the road surface. Based on observations made during the development of this plan, anticipated road upgrades may include replacement of undersized culverts, grading and road resurfacing, and installation of adequate drainage.

The City Forest contains a total of 44 culverts: 21 stream crossing culverts, 22 ditch relief culverts and 1 ditch extension culvert. Of these, an estimated 12 stream crossing culverts and 10 ditch relief culverts will require upgrades to meet RMAP standards due to under sizing and/or improper installation. An estimated 9 of the 12 stream crossing culverts present potential barriers to fish passage. These potential barriers will need be evaluated for necessary upgrades to allow for fish passage per RMAP standards. *Refer to Road & Access Maps for culvert and upgrade location information.*

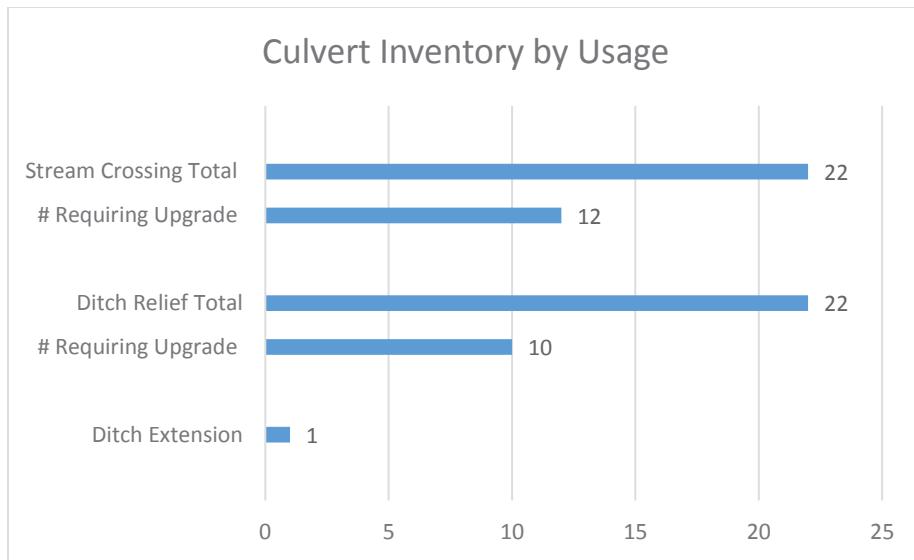


Figure 10. Culvert Installation & necessary upgrades, City Forest

Wishkah Watershed.

The Wishkah Watershed management block contains approximately 6.40 miles of forest road and an estimated 6.24 miles of abandoned railroad grade. Primary access is provided by the Wishkah Road. Access to the east is gained via the 7425 and 7400 roads. A 120 acre non-contiguous section of the Wishkah Watershed Management block (WW01 & WW02) is largely inaccessible. Travel through Rayonier property from the west provides access to the southern half of the unit. Neighboring roads along the northern half of this area may provide points for future access. An estimated six potential barriers to fish passage associated with undersized and/or perched culverts were noted on the Wishkah Watershed management block. An additional three stream crossing culverts on non-fish bearing streams and seven ditch relief culverts are undersized and will require upgrades. Portions of the stream adjacent 8000 and 9000 roads should be evaluated for grading, resurfacing and necessary drainage upgrades. Both roads occur along the bottom of relatively steep hillsides bisecting several seasonal and perennial watercourses that drain the uplands.

Two stringer bridges located on the 8000 road have been recently resurfaced. Both bridges, however have approaches unfavorable to log truck traffic. Examine bridge capacity and load limits as well as options for upgrades or alternative access.

Lake Aberdeen

The Lake Aberdeen management block contains an estimated 4.90 miles of forest road. Powerlines run east to west along the southern property boundary. Roads are in good working condition and provide adequate access for forest management needs. An estimated two potential barriers to fish passage associated with undersized and/or perched culverts were

Road Access and Easements

Access to portions of the City Forest require travel through adjoining landowner property. Alternatively, roads within the City Forest provide access to neighboring property. Access is critical in the ongoing management of the City Forest, therefore, consider pursuing written access agreements on all roads for which established agreements are not currently documented. Furthermore, consider maintaining a clear record of easements and road agreements for ease of future use.

Management Recommendations

- Work with a consultant to prioritize and implement necessary upgrades throughout the City Forest to meet current state regulated Best Management Practices as detailed in the Washington State Forest Practices Act. Develop and submit a plan to the Washington Dept. of Natural Resources defining necessary upgrades, schedule of operations and future maintenance plans. Costly upgrades often coincide with future harvest operations.
- Refer to Road & Access Maps and accompanying GIS data for specific road/culvert location, size, install and type throughout the City Forest.

WILDLIFE

The best wildlife habitats are diverse, with a mix of tree size, composition, openings and well-developed layers of shrubs and forbs. The City Forest contains a variety of terrestrial and aquatic habitat types that support healthy populations of wildlife. Common large species found throughout the City Forest include Roosevelt elk, Columbian black-tailed deer, black bear and cougar. Smaller species such as bobcat, coyote, raccoon, porcupine, rabbit, opossum and squirrel are also common. Reptiles include garter snakes, salamanders, frogs, and toads. Common bird species of this area include a variety of ducks, raptors, cavity nesters, song birds, owls as well as forest grouse.

The City Forest is capable of producing both high quality timber and wildlife habitat simultaneously. Silvicultural treatments can often be tailored to benefit both tree production and wildlife habitat. A key concept in wildlife management is forest succession. Forest succession refers to the process of ecological change in species and vegetative structure of a given location over time. After a disturbance such as logging, fire or wind damage, a series of predictable successional stages occur through the development of a forest. Each stage results in different habitat for wildlife species. In a region dominated by even-aged Douglas-fir forests similar to the City Forest, maintaining a mix of successional stage (age class) habitats creates for landscape scale diversity and improved habitat conditions and opportunities. For stand level management, retaining defective or dead trees (snags), leaving or creating down logs (coarse woody debris), retaining legacy structures such as wolf trees (large, broad, limby trees with spreading crown of little value) or large stumps can help increase available habitat.

Management Recommendations

- Monitor stand density to ensure a healthy level of shrub and herbaceous understory species. Thin within areas where crown closure may have reduced available light. Monitor young stands for crown closure and thin prior to reductions in understory vegetation, this will increase stand productivity and wildlife habitat.
- Retain snags and wildlife trees consistent with rules and regulations of the Washington State Forest Practices Act.

PROTECTION OF SPECIAL RESOURCES AND BIODIVERSITY

Unique, Special and/or Important Sites

Unique, special and/or important sites are those identified by the landowner that are significant and/or deserving of recognition and protection. Common sites include but are not limited to a unique tree, grove, large stump, habitat community, trail, water feature or other natural or man-made attribute on the property. These areas often require extra management consideration such as buffering or signage to ensure protection from forest management activities. Unique, special and/or important sites of note on the City Forest include the Malinowski Dam, Lake Aberdeen Recreational Area and James Stewart Memorial Park.

Threatened, Endangered, Candidate Species of Concern, Priority Habitat - Animal and/or Plant

The Endangered Species Act (ESA) defines an endangered species as one in danger of extinction and a threatened species as one likely to become endangered in the future. Protected species most likely to be encountered within the region include the marbled murrelet and Northern spotted owl. Bull trout is the only federally listed fish species under the Endangered Species Act in the region.

Priority Habitats and Species or PHS are identified by the Washington Department of Fish and Wildlife as species and habitats that require protective measures for their survival due to their population, status, sensitivity to habitat alteration, and/or recreational, commercial, or tribal importance. PHS species include State endangered, threatened, sensitive and candidate species. Additional protection measures may be required for certain threatened and endangered species while conducting forest practices requiring an approved Forest Practices Application. The WA DNR Forest Practices Division will assist in identifying the presence of a threatened or endangered species on forestland.

A Marbled Murrelet Habitat Assessment and Protocol Survey was conducted in conjunction with neighboring Olympic Resource Management on a portion of land (LA02) within the Lake Aberdeen management block in 2000. The purpose of the survey was to determine if sufficient potential marbled murrelet nesting platforms as defined under the Washington State forest Practices Rules (WAC 222-10-042) existed prior to timber harvest. Results suggested sufficient habitat was not detected and no marbled murrelet survey was required. LA02 was subsequently harvested the following year.

Cultural Resources and/or Historical Sites

This region contains a rich history of indigenous human activity as well as early pioneering settlements and homesteaders. Cultural resources and historical sites include archaeological sites and objects; historic sites and objects; as well as traditional sites and objects used by Native Americans. Examples of cultural resources may include human graves, settlement and traditional sites, culturally modified trees, shell middens, tools and fish traps. Examples of

historical sites may include cabins, fences, mining/logging camps, roads/trestles, logging equipment, tools, pottery and cans. The WA DNR Forest Practices Division will assist in identifying the presence of a cultural resource or historical site on forestland. Identification of cultural or historical resources does not always mean forest practices must cease. Decisions are based on resource type, location as well as if the proposed activity will disturb the resource.

Biodiversity

The City Forest supports a diverse mixture of vegetation. Species diversity occurs within each forest layer including the tree, shrub and herbaceous layers. Diverse forests are less susceptible to negative impacts from forest pathogens and insects and are better able to withstand damage from abiotic events such as wind, drought or fire. Maintaining a biodiverse forest may significantly decrease impacts from common forest health concerns within the City Forest.

Forests of Recognized Importance (FORI)

Forests of Recognized Importance or FORI represent globally, regionally and nationally significant large landscape areas of exceptional ecological, social, cultural and/or biological values. These forests are evaluated at the landscape level, rather than the stand level and are recognized for the combination of unique values, rather than a single attribute (e.g. National Parks). FORIs can also include such things as natural area preserves and conservation areas managed by government agencies and private conservation groups. Examples of potential FORI within the region include the Olympic National Forest, Olympic National Park, State/County Parks, Natural Area Preserves, Natural Resource Conservation Areas or other identified forested areas of major significant.

Management Recommendations

- Identify and protect special sites pertaining to the property. Follow Forest Practice rules pertaining to the protection of special sites.

SUMMARY OF RECOMMENDATIONS

Forest Health

1. Evaluate forest stands for signs of tree competition and overstocking. Insect and disease agents are more prevalent in stagnated and stressed trees, therefore, many of the mentioned forest health concerns can be avoided simply by managing density.
2. Monitor property for forest insects and disease and evaluate if management action is necessary.
3. Monitor property for invasive exotic species of plants and evaluate if management action is necessary.
4. Maintain up-to-date fire emergency contact information: Washington DNR Forest Fire Reporting (800) 562-6010

Soils

1. Limit compaction/soil disturbance.
2. Schedule forest operations requiring heavy equipment for seasonally dry periods in order to avoid rutting, soil compaction, erosion and damage to tree roots, especially within the Wishkah Watershed management block.
3. Monitor roads and open spaces annually for erosion and rutting and treat accordingly.

Water/Quality/Riparian and Fish Habitat/Wetlands

1. Adequately buffer streams in accordance with Forest Practices Rules and regulations.
2. Avoid the use of heavy equipment in and around riparian areas or on saturated soils in an effort to reduce erosion and sediment delivery.
3. Monitor roads and open spaces for erosion and sedimentation and treat accordingly.

Forest Inventory/Timber/Wood Products

**Refer to “Management Recommendations” within the Forest Inventory/Timber/Wood Products section for stand specific recommendations and timeline.*

1. Pre-commercial thin young stands prior to live crowns receding beyond 40 percent. For even-aged management, this typically occurs around 10-15 years of age. Thin from below extracting the most suppressed and defective trees.
2. Work with a consulting forester to prioritize harvesting of large oversized timber within the Wishkah Watershed Management Block prior to an anticipated decrease in value. A harvest plan should take into consideration the following: location of stands with high percentage of large diameter timber, available access, market conditions and protection of water quality and quantity.
3. Consider consultation with a hydrologist in conjunction with developing a harvest plan for the Wishkah Watershed management block. Trees, through the process of

transpiration, consume large quantities of water. Removal of forest cover can alter hydrologic function until revegetated.

4. Evaluate early harvest and conversion of overstocked stand conditions. Overstocking and stagnation has resulted in stands of unproductive and wind damaged trees. Thinning is not recommended as trees under these conditions are at an increased risk of wind damage.

Property Access/ Forest Roads

1. Work with a consulting forester to prioritize and implement necessary upgrades throughout the City Forest to meet current state regulated Best Management Practices as detailed in the Washington State Forest Practices Act. Develop and submit a plan to the Washington Dept. of Natural Resources defining necessary upgrades, schedule of operations and future maintenance plans. Costly upgrades often coincide with future harvest operations.
2. Refer to Road & Access Maps and accompanying GIS data for specific road/culvert location, size, and type throughout the City Forest.
3. Access is critical in the ongoing management of the City Forest, therefore, consider pursuing written access agreements on all roads for which established agreements are not currently documented. Furthermore, consider maintaining a clear record of easements and road agreements for ease of future use.
4. Examine and establish clear records as to which property boundaries and corners have been surveyed and marked. Consider an effort to survey and establish property corners not yet completed. Survey and blaze property boundaries where mature timber exists.
5. Two stringer bridges located on the 8000 road have approaches unfavorable to log truck traffic. Examine bridge capacity and load limits as well as options for upgrades or alternative access.

Wildlife

1. Monitor stand density to ensure a healthy level of shrub and herbaceous understory species. Thin within areas where crown closure may have reduced available light. Monitor young stands for crown closure and thin prior to reductions in understory vegetation, this will increase stand productivity and wildlife habitat.
2. Retain snags and wildlife trees consistent with rules and regulations of the Washington State Forest Practices Act.

Protection of Special Resources and Biodiversity

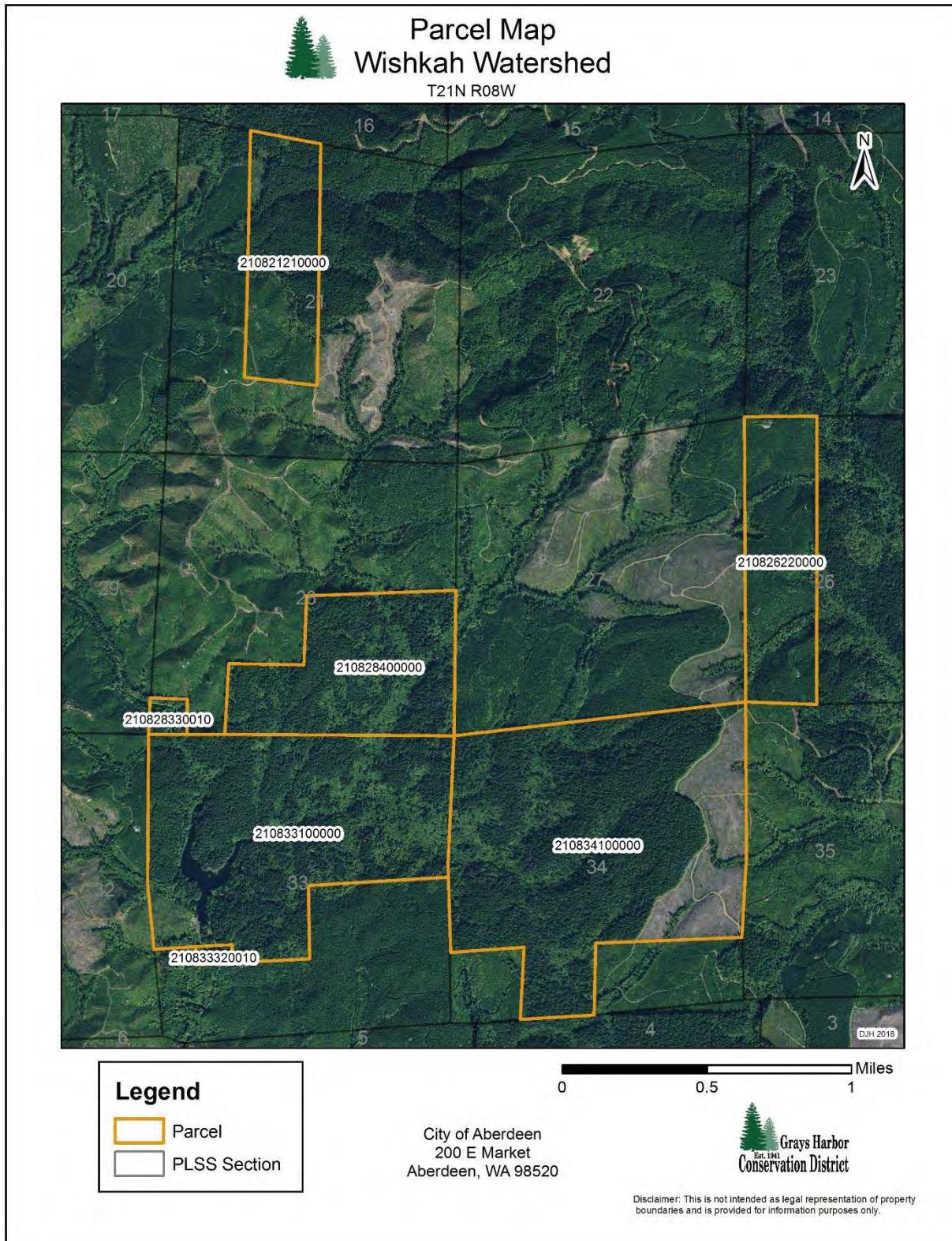
1. Identify and protect special sites pertaining to the property. Follow Forest Practice rules pertaining to the protection of special sites.

AERIAL PHOTO(S)/PROPERTY AND RESOURCE MAP(S)

The following resources maps are included for each individual management block:

- Parcel Map
- Stand Map
- Road & Access Map
- Topographic Map
- Water Type Map
- Site Class Map
- 2018 Age Class Distribution Map
- LiDAR Map (if LiDAR data available)
- Soils Map

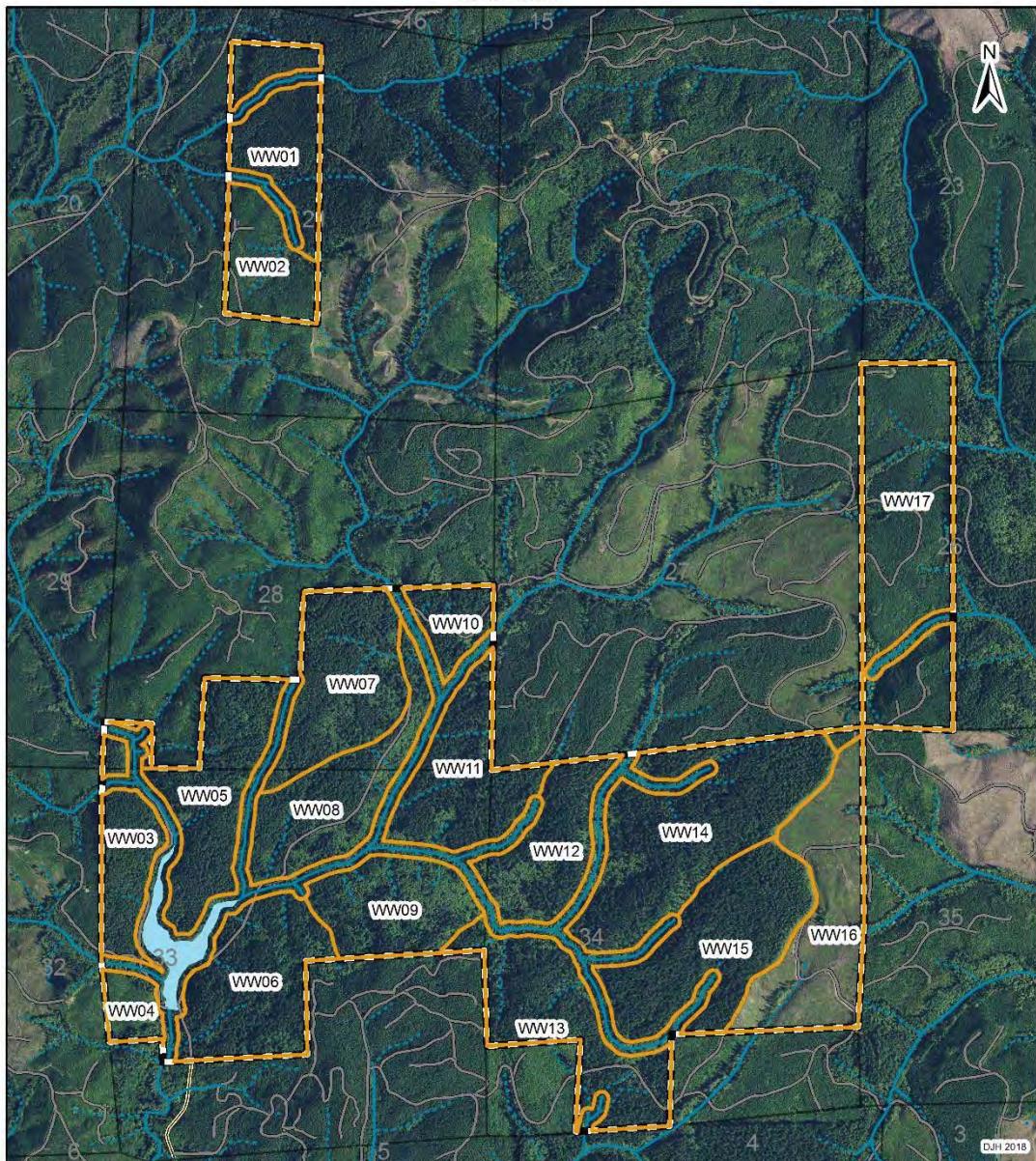
Wishkah Watershed





Forest Stand Map Wishkah Watershed

T21N R08W



Legend

- City of Aberdeen
- Stand
- Type S & F
- Type N
- Forest Road

0 0.5 1 Miles

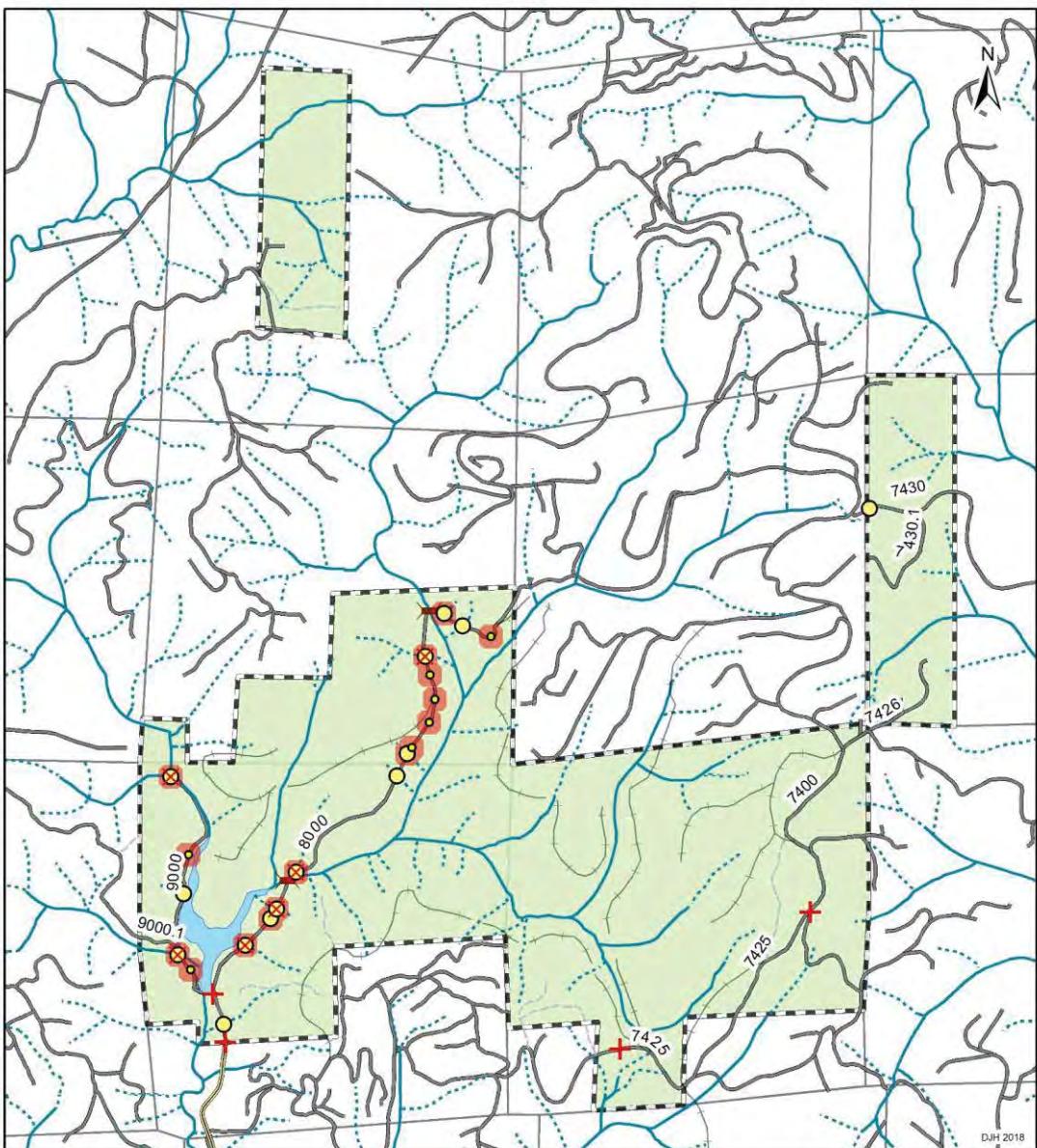
City of Aberdeen
200 E Market
Aberdeen, WA 98520



Disclaimer: This is not intended as legal representation of property boundaries and is provided for information purposes only.



Road & Access Map Wishkah Watershed



Legend

City of Aberdeen	Type S & F
Forest Road	Type N
Rail Grade	
Skid Road	
Bridge	Culvert Ditch Relief
Gate	Culvert Stream Crossing
	Culvert Upgrade Required
	Fish Barrier

0 0.5 1 Miles

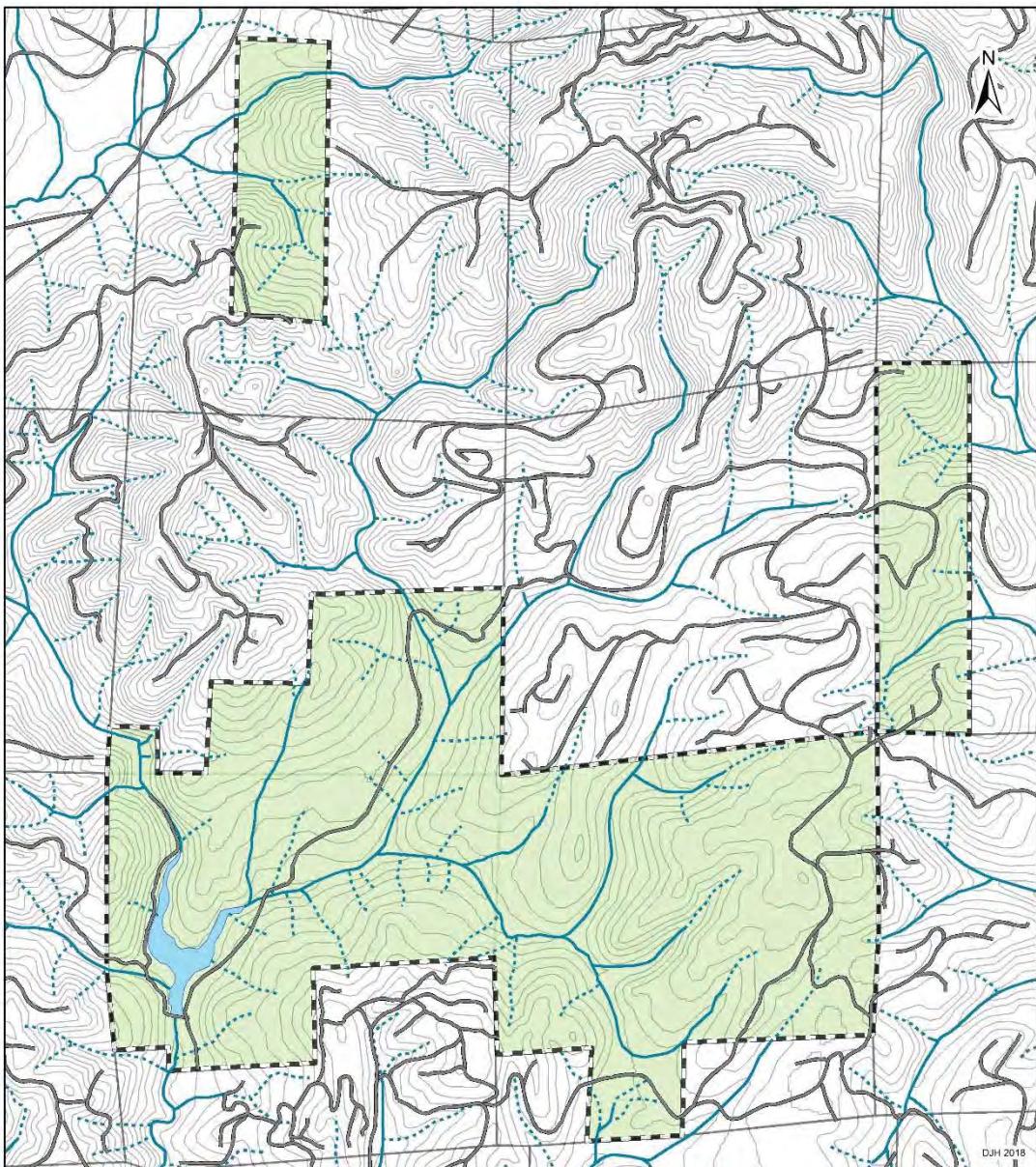
City of Aberdeen
200 E Market
Aberdeen, WA 98520



Disclaimer: This is not intended as legal representation of property boundaries and is provided for information purposes only.



Topographic Map Wishkah Watershed



Legend

- City of Aberdeen
- Contour 40'
- Forest Road
- Type N
- Type S & F

0 0.5 1 Miles

City of Aberdeen
200 E Market
Aberdeen, WA 98520

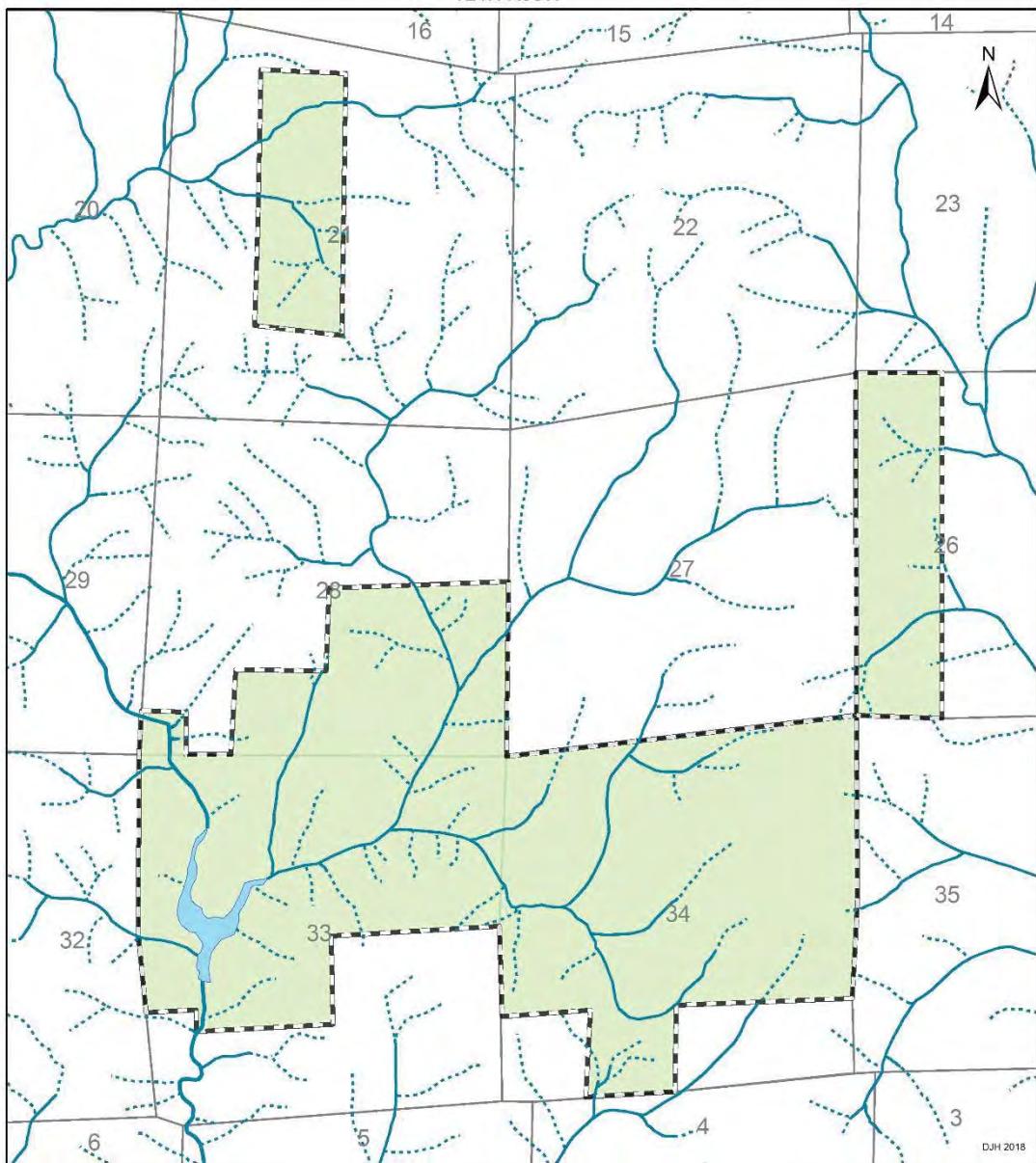


Disclaimer: This is not intended as legal representation of property boundaries and is provided for information purposes only.



Water Type Map Wishkah Watershed

T21N R08W



Legend

- City of Aberdeen
- Type S (0.5mi)
- Type F (6.0 mi)
- Type N (7.5 mi)
- Intake Pond

0 0.5 1 Miles

City of Aberdeen
200 E Market
Aberdeen, WA 98520

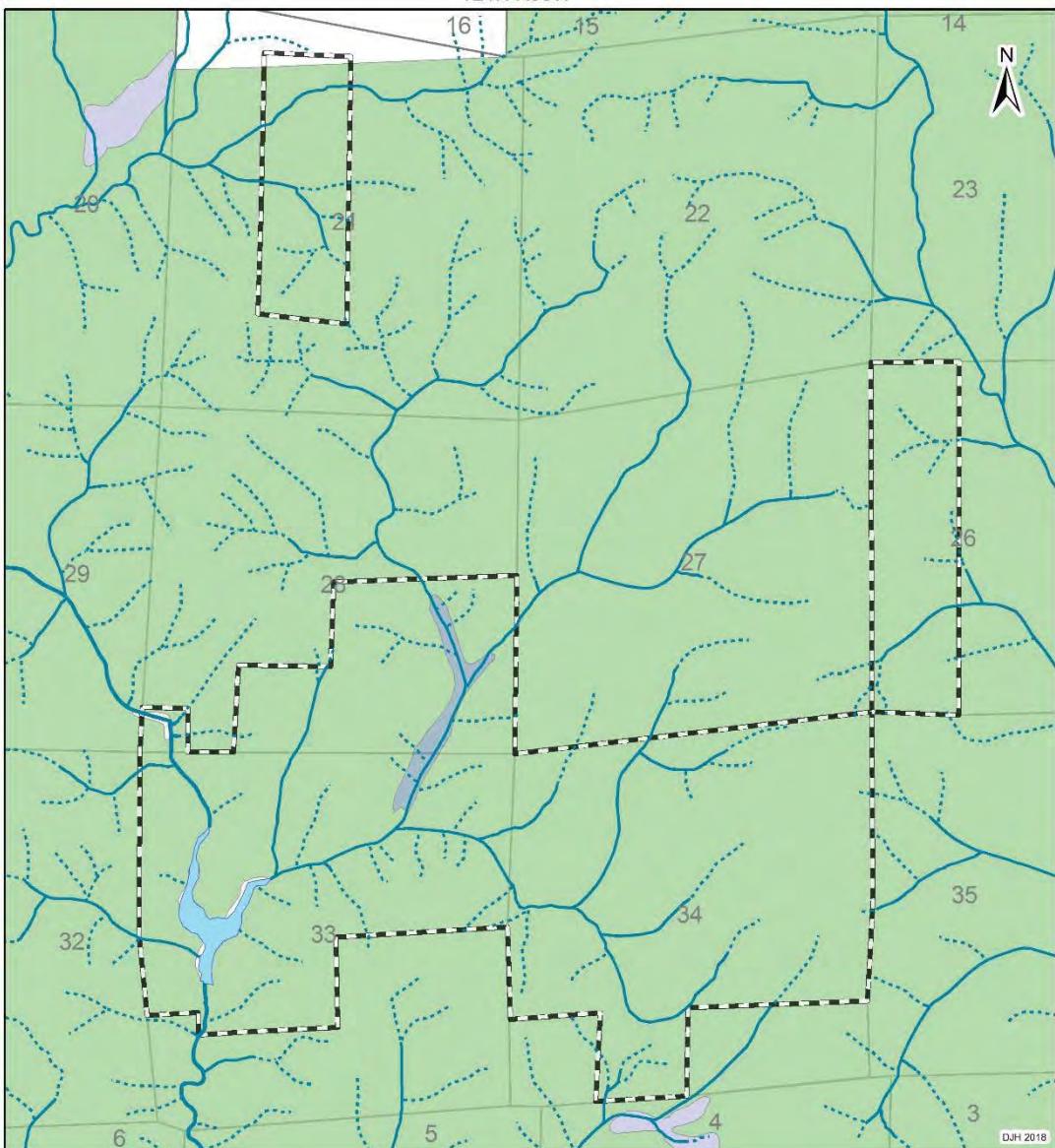


Disclaimer: This is not intended as legal representation of property boundaries and is provided for information purposes only.



Site Class Map Wishkah Watershed

T21N R08W



Legend

Site Class

- I
- II
- III
- IV
- RA
- V

0 0.5 1 Miles

City of Aberdeen
200 E Market
Aberdeen, WA 98520

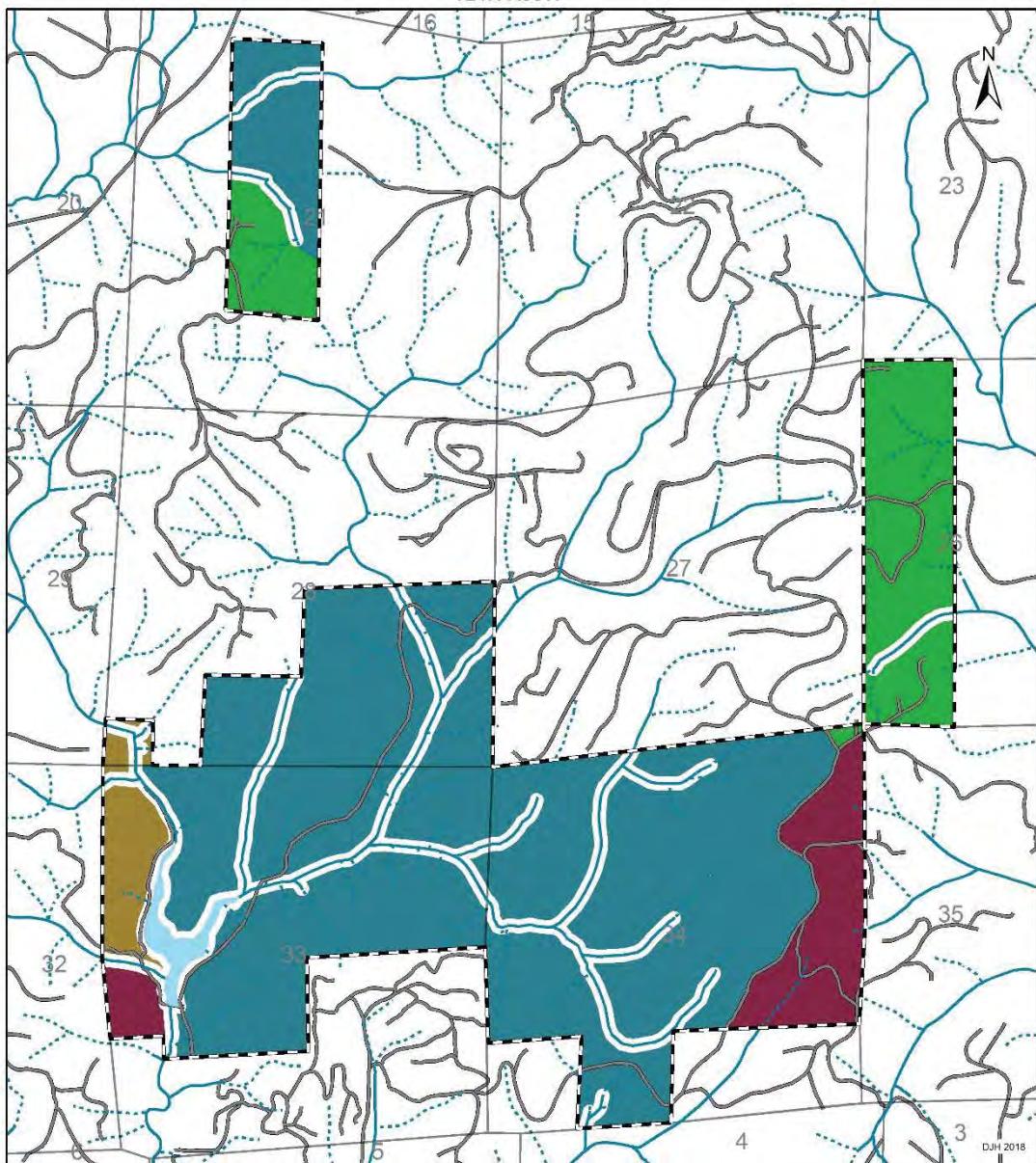


Disclaimer: This is not intended as legal representation of property boundaries and is provided for information purposes only.



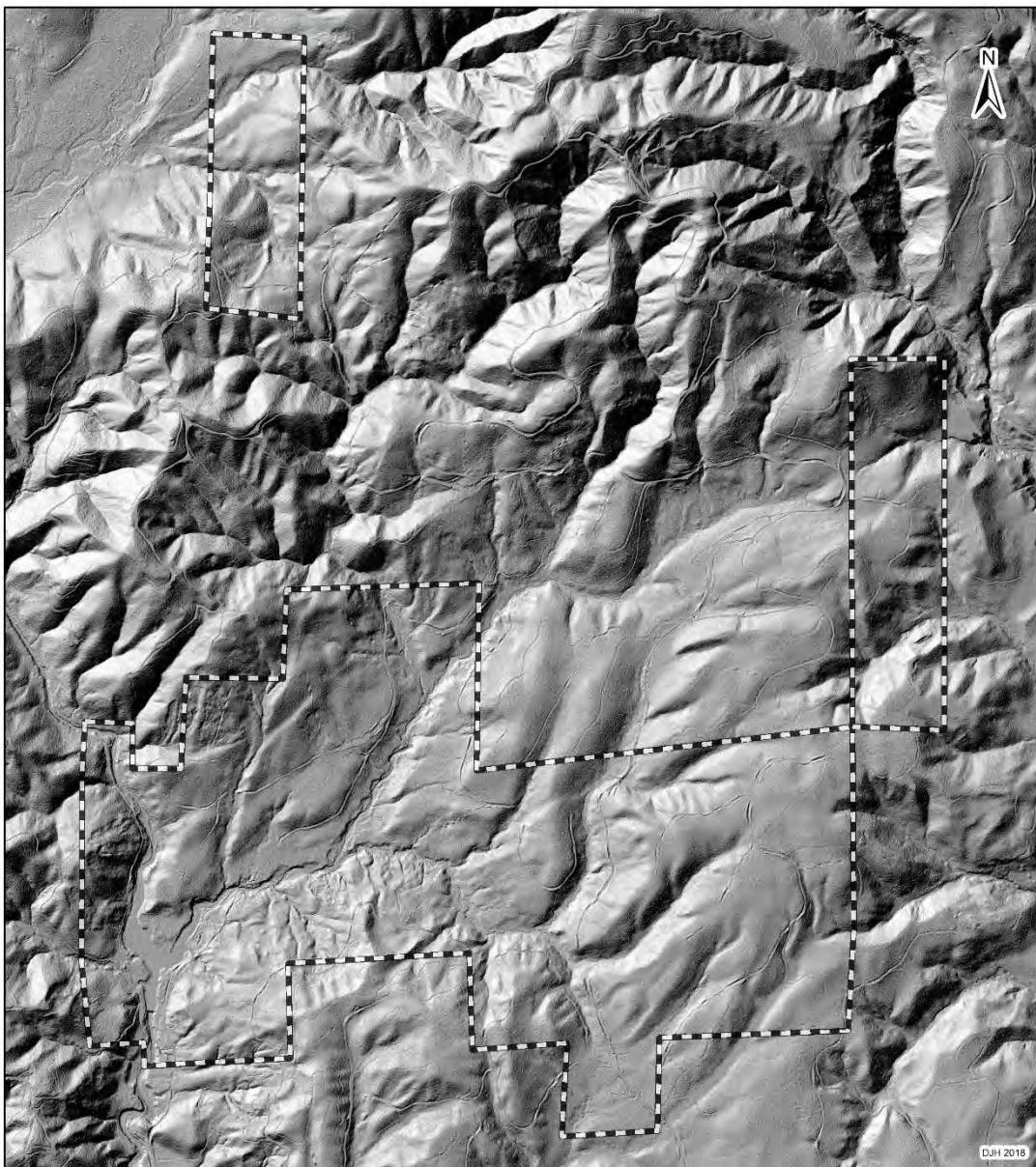
2018 Age-Class Distribution Map Wishkah Watershed

T21N R08W

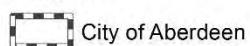




LiDAR Map Wishkah Watershed



Legend



City of Aberdeen

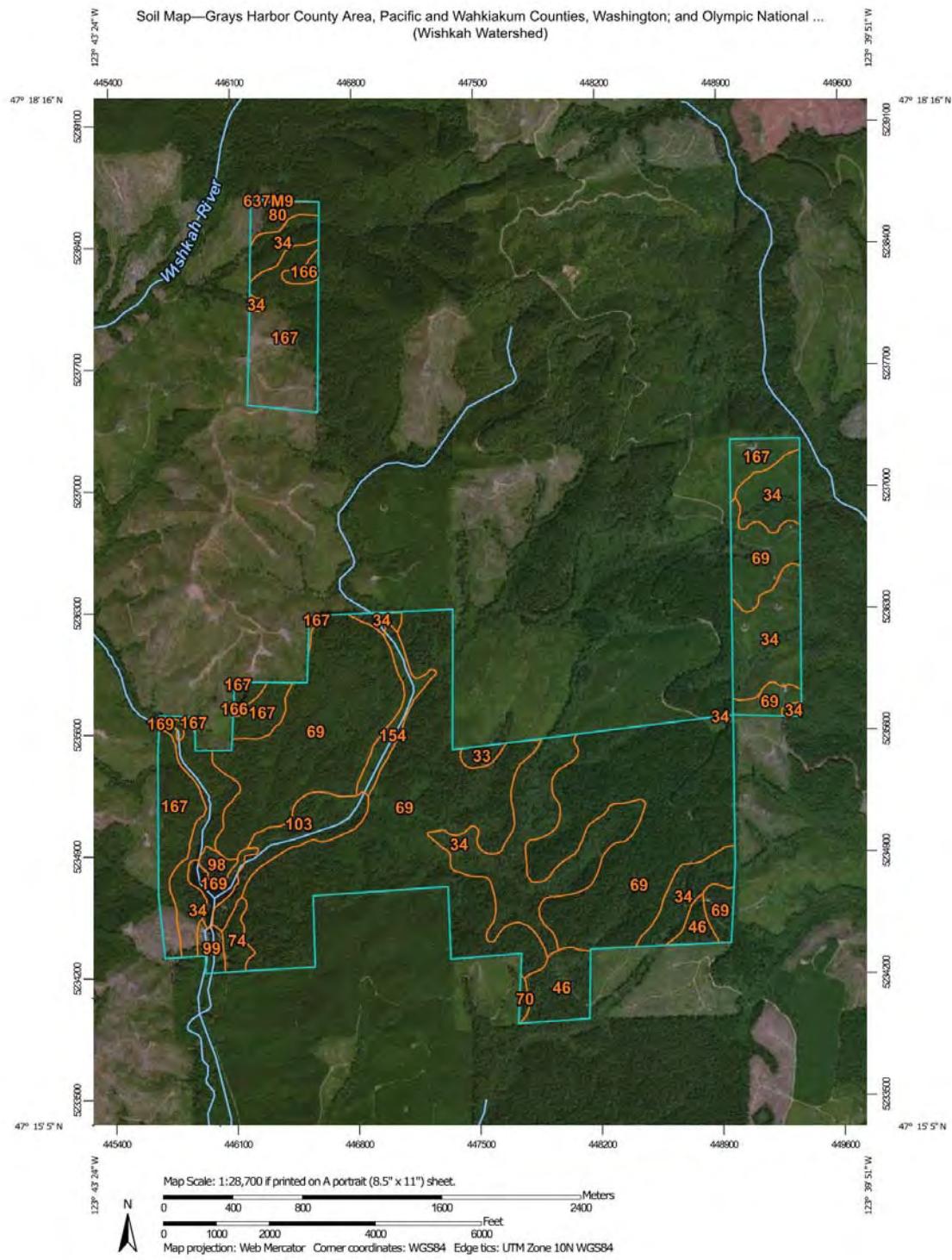
0 0.5 1 Miles

City of Aberdeen
200 E Market
Aberdeen, WA 98520



Disclaimer: This is not intended as legal representation of property boundaries and is provided for information purposes only.

Soil Map—Grays Harbor County Area, Pacific and Wahkiakum Counties, Washington; and Olympic National ...
(Wishkah Watershed)



Map Scale: 1:28,700 if printed on A portrait (8.5" x 11") sheet.

Meters

0 400 800 1600 2400 Feet

0 1000 2000 4000 6000
MJD - 2450000.0



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

9/24/2018
Page 1 of 3

WATERSHED COOPERATION AGREEMENT

THIS AGREEMENT is made on the 18th day of June, 1994 between the City of Aberdeen (the "City"), a municipal corporation of the State of Washington, and the Rayonier Timberlands Operating Co. L.P. ("Owner").

RECITALS:

A. Owner is the owner in fee simple of that certain real estate located in Grays Harbor County, Washington, legally described as set forth in Exhibit "A" attached hereto and incorporated herein by this reference (the "Property").

B. The Property lies within the Wishkah River Watershed (the "Watershed"), which is used by the City as a drinking water supply source.

C. The City has the authority under Chapter 10.10 ACC, Chapter 35.88 RCW, and Grays Harbor County Ordinance 50 (1971), to prohibit any access to or activity within the City's watershed which might in any way pollute or be harmful to the water derived therefrom.

D. Owner has the right to enter the watershed for management purposes including, but not limited to, the harvesting of forest products.

E. City and Owner recognize it is in the interest of both parties to establish clear procedures and policies governing the City's exercise of its authority while recognizing Owner's rights in order to avoid future disputes and to protect the drinking water supply of the citizens of Aberdeen.

F. The City has one purpose in this agreement and that is to preserve the water quality for those persons using the City's domestic water supply.

NOW, THEREFORE, IT IS AGREED:

1. Term. The term of this Agreement shall be twenty-five (25) years (the "Initial Term"), commencing with the execution of this Agreement and expiring twenty-five years therefrom, unless earlier terminated as provided herein. The Agreement shall automatically renew for successive one (1) year periods unless notice of either party's intent not to renew is delivered no less than sixty (60) days prior to the expiration of the Initial Term of each succeeding renewal term. Notwithstanding the foregoing, either party may terminate this Agreement, with or without cause, upon delivery of sixty (60) days prior written notice to the other party.

2. Owner's Right to Use Land. Subject to the conditions specified in this Agreement, the Owner shall have the right to enter upon, and utilize the Property for the purposes of forest management and harvest, including, without limitation, growing, protecting, cultivating and producing timber, trees and forest growth thereon, reforesting, logging, harvesting and removing timber, trees, forest growth and forest crops therefrom, and constructing, maintaining, and using such roads, trails, and other improvements as may be necessary or incidental to such operations. The Owner shall not engage in any other activities or permit any other activities on the Property without the prior written consent of the City. In any case where such consent is requested, the City may deny such request if the City, in its sole discretion, judges such use to have an adverse water quality impact or if such use is inconsistent with regulation and policies of the City and State Department of Health "Minimum Watershed Program Requirements".

3. Conditions. The Owners right to use the Property is subject to the following conditions which Owner agrees to satisfy and adhere:

3.1 Any dispute arising under the terms of this Agreement shall be submitted for resolution upon written demand to an Arbitrator mutually agreed to by the parties, or, if they are unable to agree upon the Arbitrator within TEN (10) DAYS, to an arbitrator selected from a list of 3 arbitrators provided by the Judicial Arbitration and Mediation Service (JAMS) in Seattle, Washington. Each party shall strike one name from the list. The arbitration shall proceed with due dispatch to resolution and award, and judgment upon the award rendered may be entered in any court having jurisdiction thereof. Arbitration shall be conducted at Seattle, Washington. Nothing shall give the Arbitrator the power or authority to alter, amend, change, modify, add to or subtract from any of the written terms of this Agreement.

3.2 The Owner will abide by and conduct all activities in accordance with all applicable federal, state and local laws and regulations and conditions contained in the forest practices application issued by the Department of Natural Resources, copies of which will be delivered to the City by the Owner upon execution of this Agreement.

3.3 The Owner will provide and require use of chemical toilets by all persons it hires engaged in logging or removing timber, or any other activity on the Property.

3.4 The Owner will take appropriate preventative measures to ensure that any spill of oil or oil products caused by the Owner or its contractor does not enter any stream or other waters, and will be solely responsible for the cost of cleaning up any such spill. The Owner will provide and use oil absorbing mats under all stationary landing equipment and equipment being serviced to prevent leakage or accidental spillage of petroleum base products and other chemicals from contaminating the soil and water resource. The Owner will provide containers equal in capacity to the volume of petroleum base products within the largest piece of equipment. If the total oil or oil products exceeds 1,320

gallons or if a single container exceeds a capacity of 660 gallons, the Owner shall prepare a spill prevention control and countermeasures plan satisfactory to the City. Such plan shall meet or exceed applicable E.P.A. requirements, including, without limitation, certification by a registered professional engineer.

3.5 The Owner shall not apply or permit the use of any agricultural chemicals or treatments on any portion of the Property or vegetation on the Property without the prior written approval of the City. Approval shall not be withheld unless such chemicals or treatments would have adverse water quality impact. For purposes hereof, agricultural chemical or treatments shall include, without limitation, fertilizers, pesticides and herbicides, or any other chemicals or treatments which would have adverse water quality impacts.

3.6 Prior to any road construction, the Owner shall submit to the City for approval a logging and road construction plan. Any changes in these plans, including, without limitation, a change in the location or design of any road or spur, must be reviewed in advance by the City before the change can be constructed.

3.7 The Owner shall provide access to logging sites on the Property by specified City employees at any reasonable time for the purpose of determining the Owner's compliance with provisions of this Agreement. Access shall include providing keys to any gates to the logging sites and maintaining access roads in passable condition.

3.8 The Owner shall report at least annually on forest activities to the City Director of Public Works or his designee. The Owner shall note any other activities on the land to include date and purpose; and submit such information with the annual report as part of the Watershed Control Program.

3.9 Owner, employees, agents or contractors will abide by any and all federal, state and county laws, including, without limitation, Grays Harbor County Ordinance Number 50, restricting firearms, fishing poles or any other device used to hunt or fish on the property at any time. In addition, provided in paragraph 2 above, such activities require the City's prior written consent.

3.10 The Owner will monitor Property to keep trespassers from entering upon the Property and to permit entry on the Property only by the Owner and the City and their respective officers, employees, contractors, authorized agents, and permittees.

3.11 The Owner will use best efforts to protect against fire or spreading of any fire, and to immediately extinguish any fire originating on the Property.

3.12 Upon prior written notice from the City, the Owner will follow any reasonable rules adopted from time to time by the City to further protect the Watershed from any adverse water quality impact. The Owner shall have the right to review and comment on such rules prior to adoption.

3.13 Owner will establish a watershed surveillance program based upon Washington State Forest Practices rules and regulations, to prevent adverse water quality impacts. Such plan will be comprised of road maintenance and timber harvest plans which will be provided to the City annually.

4. City's Right of Entry. At all reasonable times during the term of the Agreement, the City shall have the right to enter upon the Property for the purposes described in this Agreement and to protect the quality of its water supply, in accordance with the provisions of the State Department of Health Watershed Control Program Policy, as it may change from time to time, with full right and authority to exclude from the Property, and prevent entry to the Property, of all persons other than officers, employees, contractors, authorized agents, or permitted of the Owners. The City also shall have the right to post the land with signs stating, "Watershed Control Program".

5. Benefit and Binding Effect. This Agreement shall benefit and be binding on the parties hereto and their respective successors, heirs, and permitted assigns. This Agreement may not be assigned in whole or in part without the prior written consent of the non-assigning party. Any such assignments without the consent of the non-assigning party shall be deemed null and void and of no effect. This Agreement, and covenants and conditions contained herein, shall run with the land.

6. Indemnification. Each party shall indemnify, defend and hold harmless the other party from and against any damages, costs, or liability for personal injury or death, property damages or environmental claims, suit, fines, penalties or assessments, which it may sustain or in any manner incur by reason of or resulting from the negligent acts or omission, or willful misconduct of either the Owner or the City, or failure of the Owner or the City to satisfy any condition or keep or perform any term of covenant of this Agreement.

7. Breach of Contract and Remedies. If either party fails to perform any of the obligations imposed upon it hereunder, the other party may give written notice of the default. If the default is not cured within fifteen (15) days (time is of the essence) after such notice is given, then the non-defaulting party shall have the right (a) to obtain specific performance of the obligations contained in this contract; (b) if such specific performance is not performed in a timely manner, any activity causing adverse water quality impact must cease (See Recital C); (c) monetary damages shall include: (1) costs of reversing adverse water quality impacts, and (2) costs to the City of monitoring and enforcing the contract. The party in default shall pay all costs of enforcement of the contract.

8. Attorney Fees. If any party to this Agreement commences litigation to enforce or construe any provision of this Agreement, the prevailing party shall be entitled to recover its reasonable attorney fees and costs in such litigation and any appeal therefrom.

9. Notice, Approvals, and Contracts. For all purposes in connection with this Agreement, the contract at the City and the party responsible for all City approvals and consents shall be the Director of Public Works or his designee. All notices to be given under the terms of the Agreement must be in writing and may be delivered personally or by certified mail, postage prepaid and addressed to the party's address set forth below, or to such other address as a party may request by notice as aforesaid:

Public Works Director
200 East Market Street
Aberdeen, Washington 98520

The Owner: Rayonier Timberlands Operating Company, L.P.
P.O. Box 200
413 8th Street
Hoquiam, Washington 98550

IN WITNESS WHEREOF, the parties have executed this Agreement as of the day and year first above written.

Dated this 1st day of August, 1994.

CITY OF ABERDEEN

BY:

Mayor

TITLE:

RAYONIER TIMBERLANDS OPERATING
COMPANY, L.P.,

By: Rayonier Forest Resources Company,
Managing General Partner

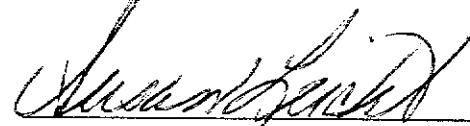
C. S. Marvin B. Smith

Authorized Individual

STATE OF WASHINGTON)
COUNTY OF Grays Harbor)
): ss

On this 1st day of August, 1994, I certify that I know or have satisfactory evidence that Steve Bentzen, is the person who appeared before me, and said person acknowledged that he signed this instrument, on oath stated that he was authorized to execute the instrument and acknowledged it as the Authorized Individual of RAYONIER FOREST RESOURCES COMPANY, Managing General Partner of RAYONIER TIMBERLANDS OPERATING COMPANY, L.P., to be the free and voluntary act of such party for the uses and purposes mentioned in this instrument.

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



NOTARY PUBLIC in and for the State of

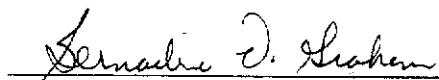
Washington, residing at Montesano

My commission expires 7/30/96

STATE OF WASHINGTON)
COUNTY OF Grays Harbor)
):ss

On this 26th day of July, 1994, I certify that I know or have satisfactory evidence that Chuck Gurrad, is the person who appeared before me, and said person acknowledged that he signed this instrument, on oath stated that he was authorized to execute the instrument as the Authorized Individual of the CITY OF ABERDEEN, a Washington Municipality, to be the free and voluntary act of such party for the uses and purposes mentioned in this instrument.

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



NOTARY PUBLIC in and for the State of

Washington, residing at Claquato

My commission expires Dec 16, 1995

BERNADINE V. GRAHAM
NOTARY PUBLIC
STATE OF WASHINGTON
My Commission Expires Dec. 16, 1995

EXHIBIT "A"

To

WATERSHED COOPERATION AGREEMENT

Legal Description to the Property:

E $\frac{1}{2}$	Sec. 19
All	Sec. 20
W $\frac{1}{2}$ NW $\frac{1}{4}$	Sec. 21
NW $\frac{1}{4}$ SW $\frac{1}{4}$	Sec. 21
All	Sec. 29
NE $\frac{1}{4}$	Sec. 30
N $\frac{1}{2}$ SE $\frac{1}{4}$	Sec. 30
E $\frac{1}{2}$ NW $\frac{1}{4}$	Sec. 30
NE $\frac{1}{4}$ SW $\frac{1}{4}$	Sec. 30
NE $\frac{1}{4}$	Sec. 32
E $\frac{1}{2}$ NW $\frac{1}{4}$	Sec. 32
N $\frac{1}{2}$ SE $\frac{1}{4}$	Sec. 32

All in Township 21N., Range 8W.W.M.

WATERSHED COOPERATION AGREEMENT

THIS AGREEMENT is made on the 15th day of July, 19⁷³ between the City of Aberdeen (the "City"), a municipal corporation of the State of Washington, and the Simpson Timber Company ("Owner").

RECITALS:

A. Owner is the owner in fee simple of that certain real estate located in Grays Harbor County, Washington, legally described as set forth in Exhibit "A" attached hereto and incorporation herein by this reference (the "Property").

B. The Property lies within the Wishkah River Watershed (the "Watershed"), which is used by the City as a drinking water supply source.

C. The City has the authority under Chapter 10.10, Chapter 35.88 RCW, and Grays Harbor County Ordinance 50 (1971), to prohibit any access to or activity within the City's watershed which might in any way pollute or be harmful to the water derived therefrom.

D. Owner has the right to enter the watershed for management purposes including, but not limited to, the harvesting of forest products.

E. City and Owner recognize it is in the best interest of both parties to establish clear procedures and policies governing the City's exercise of its authority while recognizing Owner's rights in order to avoid future disputes and to protect the drinking water supply of the citizens of Aberdeen.

F. The City's permission to use its roads without customary haul fee, and land to provide the Owner with access to the Owner's property across City owned property within the watershed is recognized by the parties as additional consideration for Owner's acceptance of the restrictions and regulations imposed by this agreement.

NOW, THEREFORE, IT IS AGREED:

1. Term. The term of this Agreement shall be twenty-five (25) years (the "initial Term"), commencing on execution of this Agreement and expiring twenty-five years therefrom, unless earlier terminated as provided herein. The Agreement shall automatically renew for successive one (1) year periods unless notice of either party's intent not to renew is delivered no less than sixty (60) days prior to the expiration of the Initial Term of each succeeding renewal term. Notwithstanding the foregoing, either party may

terminate this Agreement, with or without cause, upon delivery of sixty (60) days prior written notice to the other party.

2. Owner's Right to Use Land. Subject to the conditions specified in this Agreement, the Owner shall have the right to enter upon, and utilize the Property for the purposes of forest management and harvest, including, without limitation, growing, protecting, cultivating and producing timber, trees and forest growth thereon, reforesting, logging, harvesting and removing timber, trees, forest growth and forest crops therefrom, and constructing, maintaining, and using such roads, trails, and other improvements as may be necessary or incidental to such operations. The Owner shall not engage in any other activities or permit any other activities on the Property without the prior written consent of the City. In any case where such consent is requested, the City may deny such request if the City, in its sole discretion, judges such use materially inconsistent with the City's use on sanitary practices satisfactory to the City and the State Department of Health.

3. Conditions. The Owner's right to use the Property is subject to the following conditions which Owner agrees to satisfy and adhere:

3.1 The Owner shall not engage in any activity that could reasonably be considered to be harmful to the domestic water supply of the City, and agrees to shut down any operation that will not come into compliance with the terms of this Agreement. Any disagreement between the City and the Owner shall be resolved by judgment of the Washington State Department of Health regional engineer.

3.2 The Owner will abide by and conduct all activities in accordance with all applicable federal, state and local laws and regulations and conditions contained in the forest practices application issued by the Department of Natural Resources, copies of which will be delivered to the Owner by the City upon execution of this Agreement.

3.3 The Owner will provide and require use of chemical toilets by all persons it hires engaged in logging or removing timber, or any other activity on the Property.

3.4 The Owner will take appropriate preventative measures to ensure that any spill of oil or oil products caused by the Owner or its contractor does not enter any stream or other waters, and will be solely responsible for the cost of cleaning up any such spill. The Owner will provide and use oil absorbing mats under all

stationary landing equipment and equipment being serviced to prevent leakage or accidental spillage of petroleum base products and other chemicals from contaminating the soil and water resource. The Owner will provide containers equal in capacity to the volume of petroleum base products within the largest piece of equipment. If the total oil or oil products storage exceeds 1,320 gallons or if single container exceeds a capacity of 660 gallons, the Owner shall prepare a spill prevention control and countermeasures plan satisfactory to the City. Such plan shall meet or exceed applicable EPA requirements, including, without limitation, certification by a registered professional engineer.

3.5 The Owner shall not apply or permit the use of any agricultural chemicals or treatments on any portion of the Property or vegetation on the Property without the prior written approval of the City. For purposes hereof, agricultural chemical or treatments shall include, without limitation, fertilizers, pesticides and herbicides.

3.6 Prior to any road construction, the Owner shall submit to the City a logging and road plan. Any changes in these plans, including, without limitation, a change in the location or design of any road or spur, must be reviewed in advance by the City before the change can be constructed.

3.7 The Owner shall provide access to logging sites on the Property by the City employees at any reasonable time for the purpose of determining the Owner's compliance with provisions of this Agreement. Access shall include providing keys to any gates to the logging sites and maintaining access roads in passable condition.

3.8 The Owner shall report at least annually on forest activities to the City Director of Public Works or his designee.

3.9 The Owner will not permit its employees, agents or contractors to carry any firearms, fishing poles, or any other device used to hunt or fish on the Property at any time.

3.10 The Owner will use reasonable efforts to keep trespassers from entering upon the Property and to permit entry on the Property only by the Owner and the City and their respective officers, employees, contractors, authorized agents, and permittees.

3.11 The Owner will use best efforts to protect against fire or spreading of any fire, and to immediately extinguish any fire originating on the Property.

3.12 Upon prior written notice from the City, the Owner will follow any reasonable rules adopted from time to time by the City to further protect the Watershed from any unhealthful activities on the Property. Notwithstanding the above, the Owner shall have the right to review and comment on such rules prior to adoption.

4. City's Right of Entry. At all reasonable times during the term of this Agreement, the City shall have the right to enter upon the Property for the purposes described in this Agreement and to protect the quality of its water supply, with full right and authority to exclude from the Property, and prevent entry to the Property, of all persons other than officers, employees, contractors, authorized agents of permittees of the Owner.

5. Benefit and Binding Effect. This Agreement shall benefit and be binding on the parties hereto and their respective successors, heirs, and permitted assigns. This Agreement may not be assigned in whole or in part without the prior written consent of the non-assigning party. Any such assignment without the consent of the non-assigning party shall be deemed null and void and of no effect.

6. Indemnification. Each party shall indemnify, defend and hold harmless the other party from and against any damages, costs, or liability for personal injury or death, property damage or environmental claims, suit, fines, penalties or assessments, which it may sustain or in any manner incur by reason of or resulting from the negligent acts or omission, or wilful misconduct of either the Owner or the City, or failure of the Owner or the City to satisfy any condition or keep or perform any term or covenant of this Agreement.

7. Attorney Fees. If any party to this Agreement commences litigation to enforce or construe any provision of this Agreement, the prevailing party shall be entitled to recover its reasonable attorney fees and costs in such litigation and any appeal therefrom.

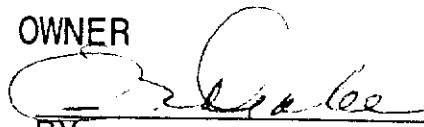
8. Notices, Approvals and Contracts. For all purposes in connection with this Agreement, the contract at the City and the party responsible for all City approvals and consents shall be the Director of Public Works or his designee. All notices to be given under the terms of this Agreement must be in writing and may be delivered personally or by certified mail, postage prepaid and addressed to the party's address set forth below, or to such other address as a party may request by notice as aforesaid:

The City: City of Aberdeen
Public Works Director
200 East Market Street
Aberdeen, Washington 98520

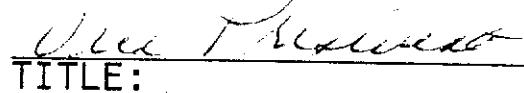
The Owner Simpson Timber Co.
Timberlands Area Engineer
P.O. Box 460
Shelton, Washington 98584

IN WITNESS WHEREOF, the parties have executed this
Agreement as of the day and year first above written.

OWNER



BY:



Lee T. Madsen

TITLE:

7/23/93

DATE:

STATE OF WASHINGTON

MASON) ss.
County of Grays Harbor)

On this day personally appeared before me
JESS DRAKE, to me known to be the individual
described in and who executed the within and foregoing instrument,
and acknowledged to me that ~~they~~ signed the same as ~~their~~ free and
voluntary act and deed, for the uses and purposes therein
mentioned.

Given under my hand and official seal this 23rd day of
July, 1993.

JUDITH L. TAYLOR
JUDITH L. Taylor
NOTARY PUBLIC in and for the
State of Washington, residing at

Shelton, WA 98534
My commission expires: April 16, 1994

CITY OF ABERDEEN

Chuck Gurrad
MAYOR:

July 15, 1993
DATE:

STATE OF WASHINGTON)
)
County of Grays Harbor) ss.

On this day personally appeared before me
Chuck Gurrad, to be known to be the Mayor
of the City of Aberdeen, who executed the within and foregoing
instrument, and acknowledged to me that he is authorized to sign
the same on behalf of the City of Aberdeen, and that he signed the
same as his free and voluntary act and deed, for the uses and
purposes therein mentioned.

BERNADINE V. GRAHAM
NOTARY PUBLIC
STATE OF WASHINGTON
My Commission Expires Dec. 16, 1995

Bernadine V. Graham
NOTARY PUBLIC in and for the
State of Washington, residing at
Cosmopolis
My commission expires: 12/16/95

EXHIBIT A
TO
WATERSHED COOPERATION AGREEMENT

Legal Description to the Property:

W1/2 of W1/2	Sec. 10
W1/2	Sec. 15
E1/2	Sec. 21
W1/2 of NW1/4	Sec. 22
SW1/4	Sec. 22
SW1/4 of SE1/4	Sec. 22
All	Sec. 27
SW1/4 of SW1/4	Sec. 34
S1/2 of SE1/4	Sec. 34
Lots 1,7,8,9,10	Sec. 16

Appendix F

Reclaimed Water Checklist

Appendix E

Reclaimed Water

Attachment # 9 - Water Reclamation Checklist for Systems with 1,000 or more Connections

Interim Guidance 11/06/2003

In 2003, Chapter 90.46 of the Revised Code of Washington (RCW) was amended to require public water systems serving 1000 or more connections to evaluate opportunities for reclaimed water when completing their water system plans. Please use this checklist to ensure that your water system plan includes sufficient information about opportunities for reclaimed water and your system's efforts to develop those opportunities.

Water System Name: City of Aberdeen Date: July 2003

PWS ID#: 00050

1.	An evaluation of water reclamation opportunities is found in the water system plan on pages: <u>Section 6.6</u> At a minimum, include the following in your evaluation of reclamation opportunities: <ul style="list-style-type: none">• An inventory of large water users.• Identification of potential reclaimed water users.• Estimates of how much water could be saved by development of reclaimed water projects• Identification of opportunities that your system intends to pursue within the next six years• An brief analysis of the financial and operation feasibility of identified opportunities The form provided on the opposite side of this page is provided to assist you in conducting an inventory of potential users and estimate savings.
2.	Provide the results of that evaluation. <ul style="list-style-type: none">• If new or additional reclaimed water opportunities are available, include a brief description of activities you are considering undertaking or those activities you will undertake to pursue development of those opportunities.• If reclaimed water opportunities are not available, include a brief description of the interaction between the wastewater facility (or other entity within the area you serve that may be a generator of reclaimed water) to evaluate opportunities to develop reclaimed water.
3.	If evaluation of water reclamation is not included because such an evaluation has been completed by the wastewater facility, or other entity, please include a copy of that evaluation. <u>N/A</u>
4.	If water reclamation is mandated for this water system through local government agreement, contract, local regulations, ordinances, or other mechanism, please provide a copy of the governing mechanism. <u>N/A</u>
5.	If this system currently receives and uses reclaimed water include the following information: <ul style="list-style-type: none">• Name of Facility• Class of Water Received (A, B, C or D)• Reclamation Permit Number• Amount of Reclaimed Water received.• A brief description of how this water is used.• Date when your utility began receiving reclaimed water <u>N/A</u>

Reclaimed Water Potential Use Checklist

Appendix G

Disinfection By-Products Monitoring Plan

City of Aberdeen

Stage 1 Disinfectants/Disinfection Byproducts Monitoring Plan

The United States Environmental Protection Agency (EPA) implemented the Stage 1 Disinfectants/Disinfection byproducts Rule on January 1, 2002. This Rule requires Public Water Systems that serves at least 10,000 people and use surface water or groundwater under the direct influence of surface water supple (GWI), and add a chemical disinfectant somewhere in the treatment or distribution system, to implement a monitoring plan. This plan is to be completed and submitted to the Washington State Department of Health (DOH) no later than March 31, 2002.

The City of Aberdeen has approx. 6100 water service connections that serve over 18,000 people. The source of the City of Aberdeen's water is the headworks of the Wishkah River which has been designated GWI. This plan was written to comply with the Stage 1 Rule.

The City of Aberdeen operates a membrane filtration plant approx. 11 miles north of the city limits and provides chlorine treatment of its water at this facility. This Stage 1 Rule requires that the following be monitored:

Disinfectant Monitoring

The chlorine residual must be monitored, with the Maximum Residual Disinfectant Level (MRDL) set at 4.0 mg/L.

Disinfection Byproduct Monitoring

Total Trihalomethane (TTHM) must be monitored, with a Maximum Contaminant Level (MCL) set at 80 ug/L.

Five Haloacetic Acids (HAA5) must be monitored, with an MCL set a 60 ug/L.

Reduced Byproduct Monitoring

If the City of Aberdeen is to meet the reduced monitoring requirements, which is one sample per plant per quarter, these conditions must be met:

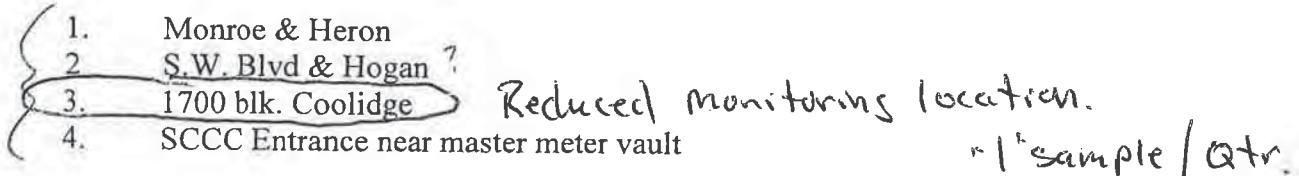
Source water annual average TOC before any treatment 4.0 mg/L and annual average TTHM 0.040 mg/L and annual average HAA5 0.030 mg/L.

The City of Aberdeen may review this option in the future.

Frequency and Location of Sampling

Four samples for TTHM and HAA5 will be taken each quarter, with one sample of each at a location representing the maximum residence time, which is 1700 blk. Coolidge for the Water System.

Locations where TTHM and HAA5 are monitored:



1. Monroe & Heron
2. S.W. Blvd & Hogan ?
3. 1700 blk. Coolidge *Reduced Monitoring location.*
4. SCCC Entrance near master meter vault *1 sample / Qtr.*

Samples will be collected by a certified waterworks operator of the Dept., and these samples will be sent to the following DOH approved lab.

Water Management Laboratories Inc.
1515 80th St. E.
Tacoma, WA 98404

Chlorine Residual

Chlorine residuals are taken at all sampling stations bi-weekly as required by DOH. These readings will be included in the quarterly Stage 1 Byproducts report

Compliance Calculations

Compliance calculations for TTHM, HAA5 and chlorine residuals are summarized below. Note that the following, however, applies to the compliance calculations:

1. If the Water System fails to take a required sample in any period, this is considered a violation for the entire period covered by the annual average.
2. If during the first year of monitoring any quarter's average will cause the running annual average of the Water System to exceed the MCL for HAA5 and TTHM, the Water System is out of compliance at the end of that quarter.
3. All averages are arithmetic averages.

TTHM and HAA5

Compliance under the Stage 1 Rule is based on the running annual average for each constituent, computed quarterly, of quarterly averages of all samples collected.

1. If the annual average of quarterly averages covering any consecutive 4-quarter period exceeds the MCL, the Water System is in violation.
2. If the water system is in violation, then it must notify the public and report to the DOH.
3. If an annual average exceeds the MCL and the Water system is on reduced monitoring, it must revert to routine monitoring immediately.

Chlorine Residual

Compliance the Stage 1 Rule is based on the running annual average for each sample computed quarterly, of quarterly averages of all samples collected.

1. If the annual average of quarterly averages covering any consecutive 4-quarter period exceeds the MRDL, the Water System is in violation.
2. If the Water System is in violation, then it must notify the public and report to the DOH.

Reporting Requirements

The Stage 1 Rule prescribes specific reporting requirements, which are listed below. Also included in this plan is a copy of the form developed by the Water System for reporting required information to the DOH.

TTHM and HAAs

1. Number of samples taken during last quarter
2. Location, date, results of each sample taken during the last quarter.
3. Average of all samples taken in the last quarter.
4. Annual arithmetic average of quarterly averages for the last quarter.
5. If MCL was exceeded, report violation to DOH

Chlorine Residual

1. Number of samples taken during each month of the last quarter.
2. Monthly arithmetic average of all sample taken in each month
3. Arithmetic average of all monthly averages for the last 12 months.
4. If MRDL was exceeded, report violation to the DOH.

CITY OF ABERDEEN - WATER DEPT

Monitoring for the Stage 1 Disinfectants/Disinfection Byproducts Rule

Quarterly Report For Department of Health

Quarter No: _____ Year: 2003

A. TTHM & HAA5 MONITORING

1. Number of samples taken during quarter:

2. Location, date and result of each sample taken:

Date	Location	TTHM(µg/L)	HAA5(µg/L)
	1. Monroe & Heron		
	2. 4th Ave & Riverwalk		
	3. S.W. Blvd & Hogan		
	4. 1700 blk. Coolidge		

3. Average of all samples taken in last quarter: TTHM= µg/L
HAA5= µg/L

4. Annual arithmetic average of quarterly averages for last 4 quarters:

TTHM= µg/L
HAA5= µg/L

5. MCL Exceeded?

B. CHLORINE RESIDUAL MONITORING

1. Number of samples taken during each month of last quarter:

2. Monthly arithmetic average of all samples taken in each month of last quarter:

Month 1=
Month 2=
Month 3=

3. Arithmetic average of all monthly averages for last 12 months:

4. MDRL Exceeded?

Signature: _____

Title: _____

Date: _____



STATE OF WASHINGTON
DEPARTMENT OF HEALTH
SOUTHWEST DRINKING WATER OPERATIONS
2411 Pacific Ave • PO Box 47823 • Olympia, Washington 98504-7823
(360) 664-0768 • FAX: (360) 664-8058
TDD Relay 1-800-833-6388

June 18, 2004

Mike Randich
Water System Manager
City of Aberdeen Water Department
1201 West Heron
Aberdeen, Washington 98520-6811

Dear Mr. Randich:

Subject: Aberdeen Water Department, ID #000509, Grays Harbor County; Stage 1 D/DBP Monitoring Plan, ODW Project #03-0412—Reduced D/DBP Monitoring

The Office of Drinking Water (ODW) has received your request dated June 7, 2004, to reduce disinfection byproducts (DBPs) monitoring.

The following table summarizes the results of DBPs monitoring for the past four quarters (3rd Quarter 2003 through 2nd Quarter 2004).

Number of Treatment Plants	Number of Sample Site Locations	Annual Total of TTHM/HAA ₅ Samples
1	4	16
TTHM Annual Average Result	HAA ₅ Average Annual Result	TOC Average Annual Result
4.8 µg/L	0.8 µg/L	0.75 mg/L

These results are far below the minimum total trihalomethane (TTHM), haloacetic acids (HAA₅), and total organic carbon (TOC) results of 40 µg/L, 30 µg/L, and 4 mg/L, respectively to qualify for reduced monitoring. Your request for reduced monitoring is therefore **APPROVED**.



Mike Randich
June 18, 2004
Page 2

Reduced monitoring will allow you to collect one TTHM and HAA₅ sample per plant per quarter at a location representing maximum residence time. The following table summarizes the treatment plant location and monitoring frequency for reduced monitoring.

Sample Site Location Representing Treatment Plant	Sample Requirements
1700 Block Coolidge	TTHM and HAA ₅ – 1 per quarter, TOC – 1 per month

Please continue to submit the quarterly report of the running annual average. There is no reduced monitoring allowed for chlorine residual measurements, so continue to collect chlorine residuals at the same time as total coliform samples are taken. In addition, there is no reduced monitoring for a monthly TOC sample collected from the source.

To remain on a reduced monitoring schedule, the average of all samples taken in a year must be no more than 60 µg/L and 45 µg/L for TTHM and HAA₅, respectively. If either exceeds its respective level, you must resume the routine monitoring schedule in the following quarter.

If you have any questions or would like to check on the status of any changes to disinfection by-product regulations, please contact me at (360) 586-2510.

Sincerely,



JERROD L. DAVIS, P.E.
Office of Drinking Water Regional Engineer

cc: Jeff Nelson, Grays Harbor Public Services
Jim McCauley, ODW
Ethan Moseng, ODW

Appendix H

2020 Consumer Confidence Report

Source Water & Filtration Info

Water Sources

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or human activity.

The City of Aberdeen's raw water source is the headwaters of the Wishkah River. The headwaters flow from the many sources in the Olympic Mountain Range such as streams, run-offs, ponds and springs, and are collected at the Malinowski Dam reservoir, the Wishkah Headworks. The watershed is reserved solely for producing drinking water. Human entry is restricted. No recreational, residential, or industrial uses occur within its boundaries. Protecting groundwater and preventing pollution is a top priority in our watershed. The City of Aberdeen carefully monitors water quality and quantity and reports testing results as required by State and Federal guidelines.

The water micro filtration plant has been online since May 1, 2000. It is located approximately 14 miles up the Wishkah Valley on Squirrel Road. The source water is filtered through nine micro filter units. Pursuant to State and Federal laws, minimal amounts of chlorine are used as a disinfecting agent to protect consumers from disease-causing micro-organisms. We are also required to add sodium hydroxide to reduce corrosion of plumbing systems. This treatment slightly increases the pH of the water that helps control lead and copper levels at the customer's taps.

In October 2000, the City began injecting fluoride into the filtered water as required by Ordinance 98-6191 to assist in preserving and promoting public health. In January 2011, the City received a guidance letter from DOH recommending the use of the low end of the existing operational range 0.8 ppm, because Americans have increased access to fluoride. The federal Department of Health and Human Services has now recommended a level of 0.7 ppm as optimal for fluoride in drinking water throughout the United States; which went into effect as of May 9, 2016.

The filtered water serves the Wishkah Valley via the transmission line and flows into the Fairview Reservoirs. These reservoirs are the beginning of the City's distribution system. Reservoir #1 and #2 have been lined and covered increasing the safety of your water supply.

Water quality and quantity is monitored regularly at the source, filtration plant, Fairview reservoirs, and again throughout the distribution system. It is the City of Aberdeen's mission that the water that reaches our customers, meets or surpasses, the State and Federal standards.

We are required to monitor your drinking water for specific parameters on a regular basis. Results of regular monitoring are an indicator of whether or not our drinking water meets health standards. During the month of January, 2020 we were unable to complete all the required monitoring for turbidity, and therefore cannot be sure of the quality of our drinking water during that time. This occurred because a Turbidimeter failed. 185 of 212 required samples were taken. The Turbidimeter was replaced a few days later. No further action is required.

Water Use Efficiency Annual Performance Report

Legislature directed DOH (Dept. of Health) to adopt an enforceable Water Use Efficiency program; which became effective on January 22, 2007. This law establishes that all municipal water suppliers must use water more efficiently.

The City of Aberdeen - Water Department held a public meeting on December 15, 2016 to propose the following Water Use Efficiency goals.

A Demand-side goal was established to help assist 20 customers per year, find and identify leaks caused by failing toilets.

A Supply-side goal was re-established to reduce System Distribution Leakage to less than 10%. The city chose to re-adopt the same Supply-side goal that was established in 2009 because the goal was not achieved by 2015. The city believes that meeting this goal is important to help conserve water resources.

Our Demand side goal of 10% distribution system leakage was not achieved in 2019.

Water use efficiency is an ongoing process. With an aging infrastructure, leaks can be small but numerous, and spread throughout our distribution system. The City of Aberdeen is committed to making progress toward our goal.

Health Effects of Lead

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. City of Aberdeen is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water.

Safe drinking water relies on all of us. Do your part to get to know it and protect it

Additional information may be found at www.epa.gov/ground-water-and-drinking-water



CITY OF ABERDEEN 2020 CONSUMER CONFIDENCE AND WATER QUALITY

THIS REPORT DESCRIBES ABERDEEN'S DRINKING WATER SOURCE AND QUALITY

The City of Aberdeen is committed to protecting its water source and supplying safe drinking water to its customers, that will meet or surpass state and federal standards.

This report is required by federal mandate and provided to you by the City of Aberdeen Water Department, a member of the American Water Works Association. The City of Aberdeen is proud to provide you with the highest quality of pristine water.

EPA SDWIS # WA5300050. Washington State Department of Health Water System ID #00050.

For more information about the AWWA, please visit [https://www.awwa.org/](http://www.awwa.org/)

For more information about your water or this report, please contact Tyson Burgess, Water Quality Coordinator, at (360) 537-3223.

This report was made for you, the consumer. Please feel free to comment on what you would like to see in the next Consumer Confidence Report when you contact us.

Health Information

Overview

We test for the following contaminants in the source water:

Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban stormwater discharges, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

There have been no detections of these contaminants, and our water system qualifies for reduced monitoring waivers.

In order to ensure that tap water is safe to drink, USEPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health. In order to insure that tap water is safe to drink, EPA sets regulations which limit the amount of certain contaminants in water provided by public water systems.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immune-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium are microbial contaminants available from the Safe Drinking Water Hotline (1-800-426-4791).

The City of Aberdeen's source for domestic water is the Wishkah River Watershed, a *surface water* source. Our Water Filtration Plant has been delivering high quality filtered water since May 1, 2000.

Last year, as in years past, your tap water met all EPA and state drinking water health standards. The City of Aberdeen vigilantly safeguards its water supplies and once again we are happy to report that our system has not violated a maximum contaminant level or any other water quality standard.

PARTS PER MILLION (ppm)	PARTS PER BILLION(ppb)
3 drops in 42 gallons	1 drop in 14,000 gallons
1 second in 12 days	1 second in 32 years
1 penny in \$10,000	1 penny in \$10,000,000
1 inch in 16 miles	1 inch in 16,000 miles

Key To Table

NTU	NEPHELOMETRIC TURBIDITY UNITS —(<i>Measurement for turbidity</i>)
ppm	Parts Per MILLION , or milligrams per liter (mg/L)
ppb	Parts Per BILLION , or micrograms per liter ($\mu g/L$)
TT	Treatment Technique — <i>Required process intended to reduce contaminant level</i>
ND	Not Detected at Testing Limit
AL	Action Level — (<i>Concentration of contaminant; which if exceeded, triggers treatment or other requirements that a water system must follow</i>)
MCL	MAX. Cont. Level — (<i>Highest level of contaminant allowed in drinking water</i>)
MCLG	MAX. Cont. Level Goal — (<i>Level below which there is no known or expected risk to health. MCLG's allow for a margin of safety</i>)

Appendix I

Water Quality Monitoring Schedule

Water Quality Monitoring Schedule

System: ABERDEEN CITY OF
Contact: MIKE RANDICH

PWS ID: 00050 9
Group: A - Comm

Region: SOUTHWEST
County: GRAYS HARBOR

NOTE: To receive credit for compliance samples, you must fill out laboratory and sample paperwork completely, send your samples to a laboratory accredited by Washington State to conduct the analyses, AND ensure the results are submitted to DOH Office of Drinking Water. There is often a lag time between when you collect your sample, when we credit your system with meeting the monitoring requirement, and when we generate the new monitoring requirement.

Coliform Monitoring Requirements

	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021
Coliform Monitoring Population	17942	17942	17942	17942	17942	17942	17942	17942	17681	17697	17697	17958
Number of Routine Samples Required	20	20	20	20	20	20	20	20	20	20	20	20

- Collect samples from representative points throughout the distribution system.
- Collect required repeat samples following an unsatisfactory sample. In addition, collect a sample from each operating groundwater source.
- For systems that chlorinate, record chlorine residual (measured when the coliform sample is collected) on the coliform lab slip.

Chemical Monitoring Requirements

Distribution Monitoring

Water Quality Monitoring Schedule

<u>Test Panel/Analyte</u>	<u># Samples Required</u>	<u>Compliance Period</u>	<u>Frequency</u>	<u>Last Sample Date</u>	<u>Next Sample Due</u>	
Lead and Copper	30	Jan 2019 - Dec 2021	standard - 3 year	06/12/2018	Jun 2021	
Asbestos	1	Jan 2020 - Dec 2028	standard - 9 year	05/11/1999	May 2021	
Total Trihalomethane (THM)	2	Jan 2020 - Mar 2020	reduced - quarterly	08/25/2020		
Total Trihalomethane (THM)	2	Apr 2020 - Jun 2020	reduced - quarterly	08/25/2020		
Total Trihalomethane (THM)	2	Jul 2020 - Sep 2020	reduced - quarterly	08/25/2020		
Total Trihalomethane (THM)	2	Oct 2020 - Dec 2020	reduced - quarterly	08/25/2020	Nov 2020	
Halo-Acetic Acids (HAA5)	2	Jan 2020 - Mar 2020	reduced - quarterly	08/25/2020		
Halo-Acetic Acids (HAA5)	2	Apr 2020 - Jun 2020	reduced - quarterly	08/25/2020		
Halo-Acetic Acids (HAA5)	2	Jul 2020 - Sep 2020	reduced - quarterly	08/25/2020		
Halo-Acetic Acids (HAA5)	2	Oct 2020 - Dec 2020	reduced - quarterly	08/25/2020	Nov 2020	

Notes on Distribution System Chemical Monitoring

For *Lead and Copper*:

- Collect samples from the COLD WATER side of a KITCHEN or BATHROOM faucet that is used daily.
- Before sampling, make sure the water has sat unused in the pipes for at least 6 hours, but no more than 12 hours (e.g. overnight).
- If you are sampling from a faucet that has hot water, make sure cold water is the last water to run through the faucet before it sits overnight.
- If your sampling frequency is annual or every 3 years, collect samples between June 1 and September 30.

For *Asbestos*: Collect the sample from one of your routine coliform sampling sites in an area of your distribution system that has asbestos concrete pipe.

For *Disinfection Byproducts (HAA5 and THM)*: Collect the samples at the locations identified in your Disinfection Byproducts (DBP) monitoring plan.

Water Quality Monitoring Schedule

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S01	Wishkah River	Surface	Use - Permanent	Susceptibility - High	
Test Panel/Analyte	# Samples Required	Compliance Period	Frequency	Last Sample Date	Next Sample Due
Nitrate	1	Jan 2020 - Dec 2020	standard - 1 year	07/28/2020	
Complete Inorganic (IOC)	1	Jan 2020 - Dec 2028	waiver - 9 year	07/28/2020	
Iron	1	Jan 2020 - Dec 2022	standard - 3 year	07/28/2020	
Conductivity	1	Jan 2020 - Dec 2022	standard - 3 year	07/28/2020	
Chloride	1	Jan 2020 - Dec 2022	standard - 3 year	07/28/2020	
TDS-Total Dissolved Solids	1	Jan 2020 - Dec 2022	standard - 3 year	05/19/1992	Aug 2021
Volatile Organics (VOC)	1	Jan 2020 - Dec 2025	waiver - 6 year	05/09/2017	May 2023
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	09/16/2019	
Pesticides	0	Jan 2020 - Dec 2022	waiver - 3 year	09/21/2010	
Soil Fumigants	0	Jan 2020 - Dec 2022	waiver - 3 year		
Gross Alpha	1	Jan 2020 - Dec 2025	standard - 6 year	07/12/2016	Jul 2022
Radium 228	1	Jan 2020 - Dec 2025	standard - 6 year	07/12/2016	Jul 2022

Water Quality Monitoring Schedule

Other Information

Other Reporting Schedules	Due Date
Measure chlorine residuals and submit monthly reports if your system uses continuous chlorination:	monthly
Submit Consumer Confidence Report (CCR) to customers and ODW (Community systems only):	07/01/2020
Submit CCR certification form to ODW (Community systems only):	10/01/2020
Submit Water Use Efficiency report online to ODW and to customers (Community and other municipal water systems only):	07/01/2020
Send notices of lead and copper sample results to the customers sampled:	30 days after you receive the laboratory results
Submit Certification of customer notification of lead and copper results to ODW:	90 days after you notify customers

Special Notes

None

Southwest Regional Water Quality Monitoring Contacts

For questions regarding chemical monitoring:	Sophia Petro: (360) 236-3046 or sophia.petro@doh.wa.gov
For questions regarding DBPs:	Regina Grimm, p.e.: (360) 236-3035 or regina.grimmm@doh.wa.gov
For questions regarding coliform bacteria and microbial issues:	Southwest Office: (360) 236-3030 or SWRO.Coli@doh.wa.gov

Additional Notes

The information on this monitoring schedule is valid as of the date in the upper left corner on the first page. However, the information may change with subsequent updates in our water quality monitoring database as we receive new data or revise monitoring schedules. There is often a lag time between when you collect your sample and when we credit your system with meeting the monitoring requirement.

We have not designed this monitoring schedule to display all compliance requirements. The purpose of this schedule is to assist water systems with planning for most water quality monitoring, and to allow systems to compare their records with DOH ODW records. Please be aware that this monitoring schedule does not include constituents that require a special monitoring frequency, such as monitoring affiliated with treatment.

Any inaccuracies on this schedule will not relieve the water system owner and operator of the requirement to comply with applicable regulations.

If you have any questions about your monitoring requirements, please contact the regional office staff listed above.

Appendix J

Fire Flow Requirements

Graves, Dan

Subject: RE: Fire flow requirements

From: Rich Malizia <rmalizia@aberdeenwa.gov>

Date: Mon, Mar 1, 2021 at 11:26 AM

Subject: Re: Fire flow requirements

To: Kris Koski <cityengineer@aberdeenwa.gov>

The language remains the same in the 2015 Edition of the IFC for the fire flow

On Mon, Mar 1, 2021 at 11:07 AM Kris Koski <cityengineer@aberdeenwa.gov> wrote:

Rich,

Can you please review the attached correspondence from 2012 and let me know if the discussion of fire flow requirements from that time is still accurate? If it is still accurate, we will attach this email correspondence as evidence of our check for the water system plan update we are working on.

Kris

--

KRIS KOSKI, PE | CITY ENGINEER
City of Aberdeen Public Works Department
200 E Market St, Aberdeen, WA 98520
360.537.3218 | cityengineer@aberdeenwa.gov

--
Rich Malizia, Assistant Chief
Aberdeen Fire Dept.
700 W. Market St.
Aberdeen, Wa 98520
360-532-1254

rmalizia@aberdeenwa.gov

"Fire is Everyone's Fight"

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Fire Flow Criteria

The Washington State Survey and Rating Bureau (WSSRB) graded the City's fire protection capability in 2005. At that time, high marks were awarded for the water supply element of the evaluation. The City received an overall rating of five on a scale of one to ten with one being the most favorable. In addition, the City exceeds DOH standards within City limits and meets most of the WSSRB/ISO recommended criteria. It is anticipated that the City will be reevaluated under the WSSRB during the next few years.

The following fire flow goals are used to evaluate system storage and hydraulics:

- The fire flow goal for exclusively residential areas is 500 gpm for a duration of one hour, unless the homes are unusually large, closely spaced, or difficult to access.
- The worst-case fire flow scenario for larger commercial and institutional facilities in the lower Aberdeen and Herbig Heights pressure zones is 3,000 gpm for three hours.

Improvements recommended in the CIP were selected to enable the City to move toward these fire flow goals.

Habermeyer, Eric

From: Mike Randich [mrandich@aberdeenwa.gov]
Sent: Monday, June 25, 2012 3:06 PM
To: Habermeyer, Eric
Subject: RE: Fire Flow

Eric,

Rich is good with using nesting in the storage calcs. And as you can see from his e-mail 2 hrs @ 2500 meets requirements. I'm good later in the week, just tell me a day and time!!

Mike Randich

Water Systems Mgr.
City of Aberdeen
(360)537-3273

From: Habermeyer, Eric [mailto:Eric.Habermeyer@hdrinc.com]
Sent: Monday, June 25, 2012 1:05 PM
To: Mike Randich
Subject: RE: Fire Flow

Yes. That will work. Would you like to state the requirement as 2500 gpm at 2 hours or 3 hours? If the fire chief is OK with 2 hours, that might be better to put into the plan as it lowers the requirement in the Storage tanks. The difference between 2 to 3 hours is an additional 150,000 gals.

Also, did you raise the question of if nesting can be allowed. With nesting your fire and standby storage, you can use the greater of the two to define the required storage volume. If the fire department has no objection, I would recommend using nesting in the storage calculation.

In regards to schedule, I am working to complete a draft of the report for internal review by the end of the week. It might take an additional week to have it reviewed and address comments, then I can provide a draft to you by the second week of July for your review. Again, we will have the complete draft minus the financial chapter.

Are you available later in the week, I am finding a few more minors holes here and there where I will need some of your input. I am thinking of connecting with you on the phone towards the end of the week.

Thanks,

Eric

From: Mike Randich [mailto:mrandich@aberdeenwa.gov]
Sent: Monday, June 25, 2012 12:20 PM
To: Habermeyer, Eric
Subject: FW: Fire Flow

Eric,

Will this work?

Mike Randich

Water Systems Mgr.
City of Aberdeen
(360)537-3273

From: Rich Malizia [mailto:rmalizia@aberdeenwa.gov]

Sent: Monday, June 25, 2012 10:48 AM

To: Mike Randich

Subject: Fire Flow

Mike,

In regards to the new H2O Comp Plan:

The fire flow for the Herbig Heights area could be listed at 2500 for 3 hours. That would more than exceed the International Fire Code requirements for that area.

(Ref. IFC 2009 Table B105.1)

2500 gpm for 2 hours would suffice for a 7,701-9,400 square foot residential structure. That area is zoned residential and none of the homes are near that size nor will be in the future, lack of building space.

--

Rich Malizia, Assistant Chief
Aberdeen Fire Dept.
700 W. Market St.
Aberdeen, Wa 98520
360-532-1254

rmalizia@aberdeenwa.gov

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Appendix K
Coliform Monitoring
Plan

Coliform Monitoring Plan for: City of Aberdeen**A. System Information****Plan Date:** 03/08/2021

Water System Name <u>City of Aberdeen</u>	County <u>Grays Harbor</u>	System I.D. Number <u>00050</u>
Name of Plan Preparer Tyson Burgess	Position Water Cust Svc Sup	Daytime Phone (360) 537-3223
Sources: DOH Source Number, Source Name, Type, Pumping Capacity	<ol style="list-style-type: none">1. S01 - Wishkah River, Surface Water, 4500 gpm2. S02 - Hoquiam/34350 Aberdeen Ave (2 Way), <u>Emergency</u> Intertie, 625 gpm3. S03 - Hoquiam/34350 Port Dock (2 Way), <u>Emergency</u> Intertie, 900 gpm	
Storage: (Name - Capacity, Type)	<ol style="list-style-type: none">1. Fairview 1 - 9,500,000 gallon, Reservoir2. Fairview 2 - 15,500,000 gallon, Reservoir3. Herbig Heights 1 - 250,000 gallon, Tank4. Herbig Heights 2 - 350,000 gallon, Tank5. North Aberdeen - 100,000 gallon, Tank6. South Aberdeen – 1,000,000 gallon, Tank7. Wishkah – 50,000 gallon, Tank	
Treatment: Source Number & Process	<u>S01 – Membrane Filtration Plant</u>	

Pressure Zones: Number and name, %	1. Aberdeen Main 2. Herbig Heights 3. North Aberdeen 4. Lower Wishkah 5. Upper Wishkah 6. Bench Drive Pump	91.84% 5.31% 0.78% 2.58% 0.20% 0.40%
Population by Pressure Zone: Name, count	1. Aberdeen Main 2. Herbig Heights 3. North Aberdeen 4. Lower Wishkah 5. Upper Wishkah 6. Bench Drive Pump	16,258 940 138 456 35 71
Total Population		17,702
Number of Routine Samples Required Monthly by Regulation:		<u>20</u>
Number of Sample Sites Needed to Represent the Distribution System:		<u>10</u>
*Request DOH Approval of Triggered Source Monitoring Plan?		Yes <input checked="" type="checkbox"/> No

*If approval is requested a fee will be charged for the review.

B. Laboratory Information

Laboratory Name Grays Harbor County	Office Phone 360-249-4222 After Hours Phone 360-249-4222
Address <u>Environmental Health Division</u> <u>100 W Broadway, Suite 31</u> <u>Montesano, WA 98563</u>	Cell Phone - - Email <u>ekhambatta@co.grays-harbor.wa.us</u>
Hours of Operation M-W 8-4pm, TH 8-3pm, closed F-Su.	
Contact Name <u>Eric Khambatta</u>	
Emergency Laboratory Name Water Management Laboratories Inc	Office Phone 253-531-3121 After Hours Phone 253-531-3121

Address <u>1515 80th ST E</u> <u>Tacoma, WA 98404</u>	Cell Phone - - - Email <u>customerservice@watermanagementlabs.com</u>
Hours of Operation <u>M-F 8-5pm, Sa 9-12pm, closed Su.</u>	
Contact Name <u>Alli Ihlen</u>	

C. Wholesaling of Surface Water

	Yes	No
We are a consecutive system and purchase groundwater from another water system.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If yes, Water System Name: Contact Name: Telephone Numbers Office - - - After Hours - - -		
We sell surface water to other public water systems. If yes, Water System Name: Cosmopolis Water Department, #15050 Contact Name: Darrin Raines Telephone Numbers Office 360-533-4280 After Hours 360-580-6227	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If yes, Water System Name: Contact Name:		
If yes, Water System Name: Contact Name:		
If yes, Water System Name: Contact Name: Telephone Numbers Office - - - After Hours - - -		

If yes, Water System Name:

Contact Name:

Telephone Numbers

Office - - - After Hours - - -

D. Routine, Repeat, and Triggered Source Sample Locations*

Location/Address for Routine Sample Sites	Location/Address for Repeat Sample Sites	Surface Water Sources for Triggered Sample Sites**
X1. Chilton & Gordon	1-1. Chilton & Gordon 1-2. 534 Gordon Ave 1-3. 535 Gordon Ave	S01 S01 S01 S _____ S _____
X2. 4th Ave & Robert Gray	2-1. 4th Ave & Robert Gray 2-2. 1602 N B St 2-3. 706 Thomas St	S01 S01 S01 S _____ S _____
X3. 2800 BLK Shamrock	3-1. 2800 BLK Shamrock 3-2. 2801 Shamrock Dr 3-3. 2807 Shamrock Dr	S01 S01 S01 S _____ S _____
X4. 1800 BLK Young St	3-1. 1800 BLK Young St 3-2. 1814 Young St 3-3. 1900 Young St	S01 S01 S01 S _____ S _____
X5. 1300 BLK E Wishkah St	3-1. 1300 BLK E Wishkah 3-2. 1210 E Wishkah St 3-3. 1314 E Wishkah St	S01 S01 S01

		S____
		S____
X6. Cherry & Maple	3-1. Cherry & Maple	S01
	3-2. 2408 Cherry St	S01
	3-3. 707 Maple St	S01
		S____
		S____
X7. Heron & Monroe	3-1. Heron & Monroe	S01
	3-2. 1201 W Heron St	S01
	3-3. 1101 W Heron St	S01
		S____
		S____
X8. 1700 BLK Coolidge	3-1. 1700 BLK Coolidge	S01
	3-2. 1627 Coolidge Rd	S01
	3-3. 1705 Coolidge Rd	S01
		S____
		S____
X9. Stafford Creek Entrance (Constantine Way)	3-1. Stafford Creek Entrance (Constantine Way)	S01
	3-2. 771 SR 105 (Sewer Station)	S01
	3-3. 230 SR 105 (Bishop Athletic Complex)	S01
		S____
		S____

X10. SW BLVD & Hogan	3-1. SW BLVD & Hogan	S01
	3-2. 712 SW BLVD	S01
	3-3. 820 SW BLVD	S01
		S _____

**** When you collect the repeats, you must sample every surface water source that was in use when the original routine sample was collected.**

Important Notes for Sample Collector:

A RAW surface water fecal coliform sample is taken at the Filter Plant raw water sample station on the same day as the distribution system coliform samples. A routine entry point sample is taken from the treated water line in the lab. These two samples are in addition to the 10 distribution system samples- in compliance with both the DOH Water Quality Monitoring Schedule and the Surface Water Treatment Rule.

Each site is visited twice per month, at least one week apart. Be mindful of lab closures. Sample station maintenance should be scheduled to avoid overlapping the sample schedule.

E. Reduced Triggered Source Monitoring Justification (add sheets as needed):

The City of Aberdeen uses one Surface Water source. S-01, Wishkah River.

F. Routine Sample Rotation Schedule

Month	Routine Site(s) twice per month	Month	Routine Site(s) twice per month
January	All	July	All
February	All	August	All
March	All	September	All
April	All	October	All
May	All	November	All
June	All	December	All

G. Level 1 and Level 2 Assessment Contact Information

Name Brett Bradley	Office Phone 360-537-3274 After Hours Phone 360-580-7217
Address 1201 W Heron St, Aberdeen WA 98520	Email bbradley@aberdeenwa.gov
Name Bruce Davis	Office Phone 360-533-2327 After Hours Phone 360-589-7780

Address
1201 W Heron St, Aberdeen WA 98520

Email wtp@aberdeenwa.gov

H. *E. coli*-Present Sample Response

Distribution System <i>E. coli</i> Response Checklist				
Background Information	Yes	No	N/A	To Do List
We inform staff members about activities within the distribution system that could affect water quality.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We document all water main breaks, construction & repair activities, and low pressure and outage incidents.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can easily access and review documentation on water main breaks, construction & repair activities, and low pressure and outage incidents.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Our Cross-Connection Control Program is up-to-date.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We test all cross-connection control devices annually as required, with easy access to the proper documentation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We routinely inspect all treatment facilities for proper operation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We identified one or more qualified individuals who are able to conduct a Level 2 assessment of our water system.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have procedures in place for disinfecting and flushing the water system if it becomes necessary.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can activate an emergency intertie with an adjacent water system in an emergency.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have a map of our service area boundaries.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have consumers who may not have access to bottled or boiled water.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There is a sufficient supply of bottled water immediately available to our customers who are unable to boil their water.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have identified the contact person at each day care, school, medical facility, food service, and other customers who may have difficulty responding to a Health Advisory.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have messages prepared and translated into different languages to ensure our consumers will understand them.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
We have the capacity to print and distribute the required number of notices in a short time period.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Policy Direction	Yes	No	N/A	To Do List
We have discussed the issue of <i>E. coli</i> -present sample results with our policy makers.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If we find <i>E. coli</i> in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(Cont.)

Distribution System <i>E. coli</i> Response Checklist				
Potential Public Notice Delivery Methods	Yes	No	N/A	To Do List
It is feasible to deliver a notice going door-to-door.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have a list of all of our customers' addresses.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have a list of customer telephone numbers or access to a Reverse 9-1-1 system.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have a list of customer email addresses.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
We encourage our customers to remain in contact with us using social media.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
We have an active website we can quickly update to include important messages.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Our customers drive by a single location where we could post an advisory and expect everyone to see it.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We need a news release to supplement our public notification process.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Distribution System <i>E. coli</i> Response Plan	
If we have <i>E. coli</i> in our distribution system we will immediately:	
<ol style="list-style-type: none"> 1. Call DOH. 2. Collect repeat and triggered source samples per Part D. Collect additional investigative samples as necessary. 3. Confirm water treatment and monitoring facilities operation and control status. 4. Review new construction activities, water main breaks, or pressure outages that may have occurred during the previous month. 5. Interview relevant staff members to determine if anything unusual was happening in the water system since the last month's samples. 6. Review Cross-Connection Control Program status or other points of entry. 7. Review repeat sample results with DOH. 8. Discuss with DOH whether to issue a Health Advisory based on the findings of steps 3-7. 	

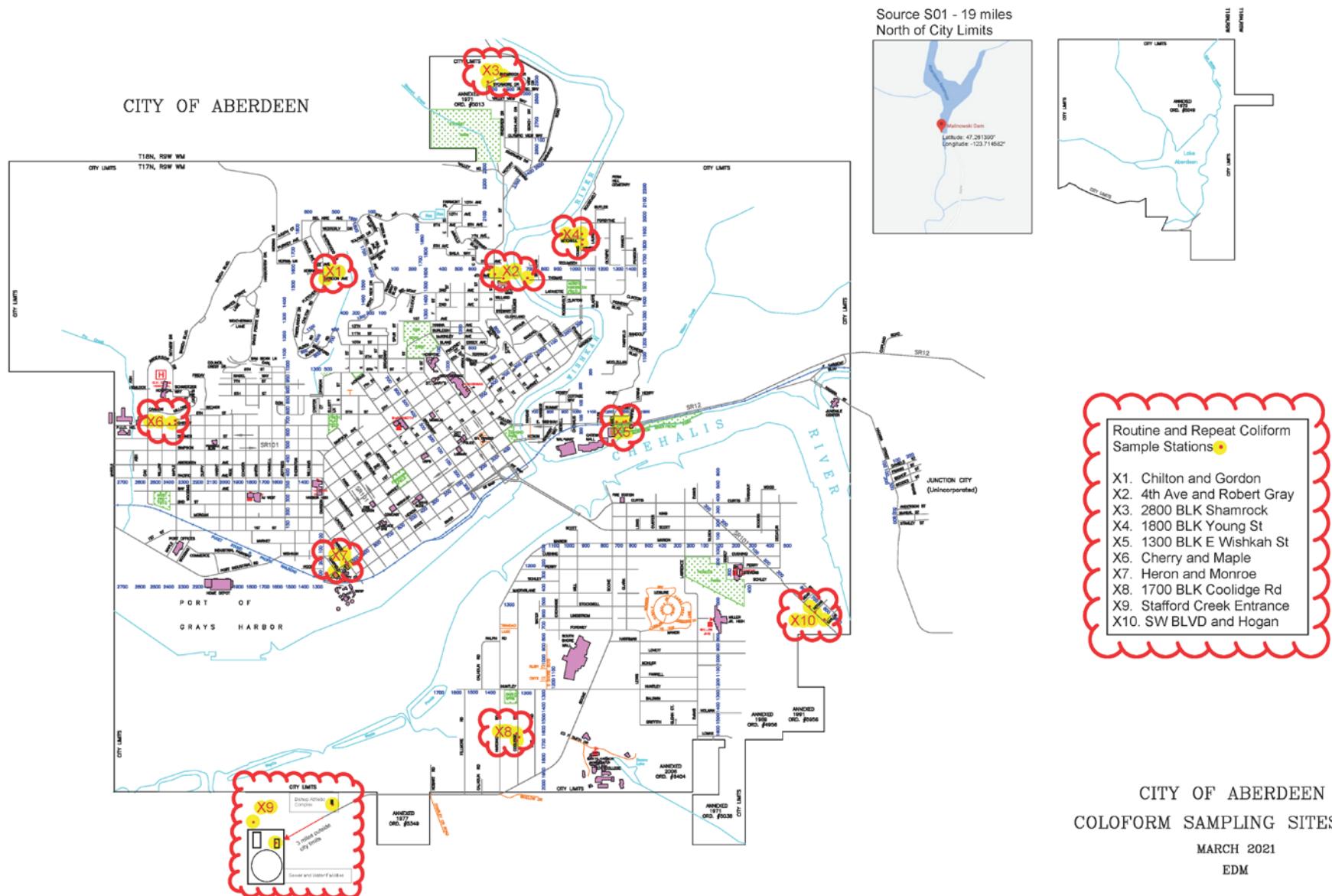
***E. coli*-Present Triggered Source Sample Response Checklist – All Sources**

Background Information	Yes	No	N/A	To Do List
We review our sanitary survey results and respond to any recommendations affecting the microbial quality of our water supply.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We address any significant deficiencies identified during a sanitary survey.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There are contaminant sources within our Watershed Protection Area that could affect the microbial quality of our source water, and If yes, we can eliminate them.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We routinely inspect our well site(s).	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
We have a good raw water sample tap installed at each source.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
After we complete work on a source, we disinfect the source, flush, and collect an investigative sample.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public Notice	Yes	No	N/A	To Do List
We discussed the requirement for immediate public notice of an <i>E. coli</i> -present source sample result with our water system's governing body (board of directors or commissioners) and received direction from them on our response plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
We discussed the requirement for immediate public notice of an <i>E. coli</i> -present source sample result with our wholesale customers and encouraged them to develop a response plan.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
We have prepared templates and a communications plan that will help us quickly distribute our messages.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

***E. coli*-Present Triggered Source Sample Response Checklist – Source S01**

Alternate Sources	Yes	No	N/A	To Do List
We can stop using this source and still provide reliable water service to our customers.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We have an emergency intertie with a neighboring water system that we can use until corrective action is complete (perhaps for several months).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can provide bottled water to all or part of the distribution system for an indefinite period.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can quickly replace our existing source of supply with a more protected new source.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Temporary Treatment	Yes	No	N/A	To Do List
This source is continuously chlorinated, and our existing facilities can provide 4-log virus treatment (CT = 6) before the first customer. If yes, at what concentration?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
We can quickly introduce chlorine into the water system and take advantage of the existing contact time to provide 4-log virus treatment to a large portion of the distribution system.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can reduce the production capacity of our pumps or alter the configuration of our storage quantities (operational storage) to increase the amount of time the water stays in the system before the first customer to achieve CT = 6.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
We can alter the demand for drinking water (maximum day or peak hour) through conservation messages to increase the time the water is in the system prior to the first customer in order to achieve 4-log virus treatment with chlorine.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I. System Map



Appendix L

Cross Connection Control Plan

Cross-Connection Control Program Plan For City of Aberdeen Water System

A. Requirement for Program

City of Aberdeen Water System, #000509, hereinafter referred to as "the Purveyor", has the responsibility to protect the public water system from contamination due to cross connections. A cross connection may be defined as "*any actual or potential physical connection between a potable water line and any pipe, vessel, or machine that contains or has a probability of containing a non-potable gas or liquid, such that it is possible for a non-potable gas or liquid to enter the potable water system by backflow through back-pressure or back-siphonage.*"

All public water systems are required to develop and implement cross-connection control (CCC) programs. The CCC requirements are contained in Washington Administrative Code (WAC) 246-290-490 of the Group A Drinking Water Regulations. The minimum required elements of a CCC program are:

1. Establishment of legal authority and program policies;
2. Evaluation of premises for cross-connection hazards;
3. Elimination and/or control of cross connections;
4. Provision of qualified personnel;
5. Inspection and testing of backflow preventers;
6. Quality control of testing process;
7. Response to backflow incidents;
8. Public education for consumers;
9. Record keeping for CCC program; and
10. Special requirements for reclaimed water use.

Other CCC program requirements include:

1. Coordination with the Local Administrative Authority (LAA), i.e., the local building or plumbing official regarding CCC activities;
2. Prohibition of the return of used water into the public water system (PWS) distribution system; and
3. Inclusion of a written CCC program in a Water System Plan (WSP) or a Small Water System Management Program (SWSMP).

Note: Throughout the example CCC program plan the term *customer* is used. *Customer* as used herein means the property owner and/or occupant of the premises served by the PWS (i.e., whoever interfaces with the PWS regarding water service). Also, unless otherwise defined, all CCC-related terms used in this example program have the same definitions as those contained in WAC 246-290-010 of the Washington State Drinking Water Regulations.

B. Program Objectives

The objectives of the CCC program are to:

1. Reasonably reduce the risk of contamination of the public water distribution system; and
2. Reasonably reduce the Purveyor's exposure to legal liability arising from the backflow of any contaminant originating from the customer's plumbing system and then supplied to other customers; and

C. Summary of Program Decisions

The following table summarizes the major policy and program decisions adopted for the City of Aberdeen water system. The items in the table represent CCC program areas that have more than one acceptable approach or option.

**CCC Program Decision Summary Table for the
City of Aberdeen**

Decision Item	Decision
1. Type of Program [General, WAC 246-290-490(2)(e)]	
a. Premises isolation only	
b. Premises isolation and in-premises protection (combination program)	X
2. Extent of Coordination with LAA [WAC 246-290-490(2)(d)]	
a. Information exchange	X
b. Interaction	X
c. Joint program	
3. Relationship with Customer [Element 1]	
a. Signed service agreement or contract	X
b. Ordinance/resolution; implied service agreement	X
4. Enforcement of Corrective Action [Element 1]	
a. Rely upon shut-off of water service	X
b. Rely upon purveyor-installed premises isolation	
5. Assessment and Re-assessment of Hazard [Element 2]	
a. By purveyor's staff or equivalent	X
b. By cross-connection control specialist (CCS) employed by customer; report reviewed by purveyor's CCS	
6. Location and Ownership of Premises Isolation Assembly [Element 3]	
a. On purveyor's service line	
b. On customer's service line	X
7. CCS Option – Purveyor's Program Management [Element 4]	
a. Purveyor's staff member certified	X
b. Inter-agency agreement or use other agency's CCS	
c. Contract with consultant CCS	
8. Testing of Assemblies [Element 5]	
a. By purveyor's staff or purveyor-employed backflow assembly tester (BAT)	
b. By customer-employed (contractor) BAT	X
9. Cost Recovery [WAC 246-290-100(4)(h) and -105(4)(p)]	
a. Borne by all customers (general water rates)	
b. Assessed to specific class (commercial meters)	
c. Each customer directly bears cost	X

CROSS-CONNECTION-CONTROL

Note: This position requires a State of Washington Cross Connection Specialist I Certificate

PLAN REVIEW

Aberdeen's Cross-Connection-Control Program begins with reviewing and approving or rejection of new construction or remodeling of existing building plans as routed by our Building Department. Particular attention is given to detecting potential cross-connections such as pumps, etc. which might overpower our system pressure thereby creating back-pressure. Some kinds of businesses automatically require backflow prevention devices. When a backflow preventer is required it must be tested by a Washington State Certified Backflow Preventer Tester to insure it performs as needed. Thereafter it must be tested annually.

ON-SITE INSPECTIONS

Sometimes it is necessary to perform an on-site inspection of a new or existing business to insure the integrity of the City's water system. Businesses occasionally will modify their plumbing and cross-connections do occur.

TESTING OF BACKFLOW DEVICES

As of February '02 there are 255 registered backflow preventers in our system. To date, the only State Certified Tester in this area is Doug Warnken of Warnken Waterworks. In April of each year a letter is sent to each homeowner or business that has a irrigation system. The letter reminds them that they have approx. 45 days to have their irrigation backflow preventer tested and to return the test results to this office where records are kept on each device. In July and September letters are sent out to those businesses that have backflow preventers required due to the nature of their operation: potential health hazards or for asthetic reasons.

MISCELLANEOUS

The backflow preventers in our system consist of Atmospheric Vacuum Breakers, Double-Check-Valve-Assemblies, Reduced-Pressure-Backflow-Devices and Pressure-Vacuum-Breaker-Assemblies. There are no registered Atmospheric Loops or registered Air-Gaps.

D. Required Elements of Program

The drinking water regulations for Group A public water systems in Washington, WAC 246-290, require CCC programs to include certain minimum elements. The elements are listed in WAC 246-290-490(3). This section describes how the water system intends to comply with each of the required program elements. Elements are numbered the same as they appear in the WAC.

Element 1: *Adoption of a written legal instrument authorizing the establishment and implementation of a CCC program.*

The **City of Aberdeen** water system has adopted an ordinance (Ordinance No. 5986), attached, which authorizes the Purveyor to implement a CCC program. The ordinance also authorizes the system to terminate water service to consumers who do not comply with the resolution. However, the primary method for protection of the distribution system will be the installation of a backflow preventer by the customer, at the customer's expense.

The ordinance shall be the primary enforcement authority for all new customers.

For customers supplied prior to the adoption of the attached ordinance, an implied service contract allows the Purveyor to protect the distribution system from contamination through a Purveyor-installed backflow preventer on a customer's service.

The written and implied contract terms are discussed further under Element 3.

AN ORDINANCE RELATING TO CROSS CONNECTIONS IN WATER SERVICE AND BACKFLOW PREVENTION DEVICES, AND ADDING A NEW SECTION TO THE ABERDEEN CITY CODE; NOW, THEREFORE,

BE IT ORDAINED BY THE MAYOR AND THE CITY COUNCIL OF THE CITY OF ABERDEEN:

Section 1. There shall be a new section added to the Aberdeen City Code which shall read as follows:

10.18.650 Cross Connections and Backflow Prevention Devices.

(A) For the purpose of this chapter a cross connection is defined as any actual or potential physical connection between a potable water line and any pipe, vessel, or machine containing a non-potable fluid, such that it is possible for the non-potable fluid to enter the potable water system by backflow through back-pressure or back-siphonage.

(B) All cross-connections shall be eliminated or protected by an approved backflow preventer. The owner of the property in which a cross connection occurs shall be responsible for any property damage or personal injuries which result from backflow which occurs as a result of the cross connection.

(C) The design and installation of backflow prevention devices shall be approved by the Public Works Director or his designee and shall conform with all applicable state laws or regulations and regulations adopted by the City of Aberdeen. All sections and provisions of the cross connection control manual of the Pacific Northwest section of the American Waterworks Association as now or hereafter amended are hereby adopted by reference as a part of this chapter in all respects as though such sections were set forth herein in full. One copy of the current manual shall be kept on file in the Office of the Finance Director of the City of Aberdeen. In the event of a conflict between the provisions of the Uniform Plumbing code as adopted by the City of Aberdeen and the provisions of the cross-connection control manual, the provisions of the cross connection control manual shall control.

(D) All backflow prevention devices, including reduced pressure backflow assemblies, double check valve assemblies, pressure vacuum breaker assemblies, and all air gaps installed in lieu of an approved backflow prevention device shall be inspected at least annually. Tests of the backflow devices shall be conducted by a State Department of Health certified backflow device Tester and the expense of the test shall be paid for by the utility customer. Completed test reports shall be returned to the Aberdeen Water Department within 30 days after the utility customer's receipt of the annual test notification.

(E) Failure of a water utility customer to cooperate in the installation, maintenance, repair, inspection or testing of backflow prevention devices shall be grounds for immediate termination of water service to the premises. The City shall not be liable for any damages resulting from such termination. Authorized employees of the City of Aberdeen shall have free access at reasonable hours of the day to all parts of the premises to which water is supplied.

(F) The provisions of this chapter shall be enforced by the Public Works Director or his designee.

PASSED and APPROVED this 15th day of January, 1992

Chuck Gurnee
M A Y O R

ATTEST:

Fran M. Schum
Finance Director

Section 13.56.620 Cross-connections and backflow prevention devices.

A. For the purpose of this chapter, a cross-connection is defined as any actual or potential physical connection between a potable water line and any pipe, vessel, or machine containing a nonpotable fluid, such that it is possible for the nonpotable fluid to enter the potable water system by backflow through back-pressure or back-siphonage.

B. All cross-connections shall be eliminated or protected by an approved backflow preventer. The owner of the property in which a cross-connection occurs shall be responsible for any property damage or personal injuries which result from backflow which occurs as a result of the cross-connection.

C. The design and installation of backflow prevention devices shall be approved by the public works director or his designee and shall conform with all applicable state laws or regulations and regulations adopted by the city of Aberdeen. All sections and provisions of the cross-connection control manual of the Pacific Northwest section of the American Waterworks Association as now or hereafter amended are adopted by reference as a part of this chapter in all respects as though such sections were set forth herein in full. One copy of the current manual shall be kept on file in the office of the finance director of the city of Aberdeen. In the event of a conflict between the provisions of the Uniform Plumbing code as adopted by the city of Aberdeen and the provisions of the cross-connection control manual, the provisions of the cross-connection control manual shall control.

D. All backflow prevention devices, including reduced pressure backflow assemblies, double check valve assemblies, pressure vacuum breaker assemblies, and all air gaps installed in lieu of an approved backflow prevention device, shall be inspected at least annually. Tests of the backflow devices shall be conducted by a state department of health certified backflow device tester and the expense of the test shall be paid for by the utility customer. Completed test reports shall be returned to the Aberdeen Water Department within thirty (30) days after the utility customer's receipt of the annual test notification.

E. Failure of a water utility customer to cooperate in the installation, maintenance, repair, inspection or testing of backflow prevention devices shall be grounds for immediate termination of water service to the premises. The city shall not be liable for any damages resulting from such termination. Authorized employees of the city of Aberdeen shall have free access at reasonable hours of the day to all parts of the premises to which water is supplied.

F. The provisions of this chapter shall be enforced by the public works director or his designee. (Prior code § 10.18.650)

Element 2: *Development and implementation of procedures and schedules for evaluating new and existing service connections to assess the degree of hazard.*

Initial Cross-Connection Hazard Surveys

The procedures for evaluating the backflow prevention requirements for new and existing customers are as follows:

1. For all *new non-residential services*, the Purveyor will require that the customer submit with the application for water service an evaluation (performed at customer's expense) by a DOH-certified cross-connection control specialist (CCS) of the hazard posed by the proposed plumbing system, with recommendations for the installation at the meter of either a double-check valve assembly (DCVA) or a reduced-pressure principle backflow assembly (RPBA), or commensurate in-premises backflow protection, acceptable to the degree of hazard. The Purveyor may accept the recommendations or submit the recommendations to a CCS employed by the PWS for peer review and concurrence, before acceptance.

As an alternative to the above requirement for a survey by a CCS, the customer may agree to install an approved air gap (AG) or RPBA for premises isolation as a condition of service.

2. For all *new residential services*, the Purveyor will require that the customer submit with the application for water service a completed "Water Use Questionnaire" (attached). If the customer's questionnaire indicates special plumbing, such as a lawn sprinkler system, or hazardous water use on the premises, the customer shall submit to the Purveyor an evaluation by a DOH-certified CCS of the hazard posed by the proposed special plumbing system, with recommendations for the installation at the meter of either a DCVA or an RPBA, or commensurate in-premises protection, acceptable to the degree of hazard.

As an alternative to the above requirement for a survey by a DOH-certified CCS, the Purveyor, at his/her discretion, may specify the backflow preventer required to be installed as a condition of service.

3. For all *existing non-residential services*, the Purveyor will require the customer to submit to the Purveyor, within nine months of notification, an evaluation by a DOH-certified CCS, of the hazard posed by the plumbing system, with recommendations for the installation at the meter of either a DCVA or an RPBA or commensurate in-premises backflow preventers, acceptable to the degree of hazards. The Purveyor may accept the recommendations or submit the recommendations to a CCS employed by the Purveyor for peer review and concurrence, before acceptance.

As an alternative to the above requirement for a survey by a DOH-certified CCS, the customer may agree to install an AG or RPBA for premises isolation within 90 days of notification by the Purveyor or an alternate time period acceptable to the Purveyor.

4. For all *existing residential services*, the Purveyor will require the customer to submit to the Purveyor, within four months of notification, a completed "Water Use Questionnaire." If the customer's reply indicates special plumbing or water use on the premises, the customer shall

submit an evaluation by a DOH-certified CCS of the hazard posed to the water system by the customer's plumbing system, with recommendations for the installation at the meter of either a DCVA or an RPBA, or commensurate in-premises backflow preventers, acceptable to the degree of hazard".

As an alternative to the above requirement for a survey by a CCS, the Purveyor may specify the backflow preventer required to be installed as a condition of service. The Purveyor's CCS will provide guidance on the type of backflow preventer to be installed.

5. For all existing services, should the customer fail to supply the required information for a hazard assessment or fail to submit a completed "Water Use Questionnaire," the Purveyor may have the assessment made by a CCS employed by the Purveyor, require the installation of an RPBA for premises isolation, or take other such actions consistent with the previously stated policies and bill the customer for the associated costs.

Cross-Connection Hazard Survey Schedule for Initial Hazard Assessments

The schedule for initial hazard assessment is outlined in the following table. The schedule starts from the date the CCC program is established.

Initial Assessment Task	Schedule
Assessment of all new connections	At time of application for water service
Identification and assessment of high-hazard premises which are listed on Table 9 of Washington Administrative Code (WAC) 246-290-490	Within nine months
Identification and assessment of hazardous premises supplemental to Table 9 of WAC 246-290-490	Within 12 months
Identification of residential connections with special plumbing facilities and/or water use on the premises	Within 15 months

Cross-Connection Hazard Survey Schedule for Subsequent Hazard Re-Assessments

For subsequent cross-connection hazard surveys, procedures for evaluating the backflow prevention requirements are:

1. For **residential services**, the Purveyor will require the customer to submit to the Purveyor, within two months of purveyor notification, a completed "Water Use Questionnaire." The procedure used for evaluating the hazard re-assessment and the potential change in the required backflow prevention will be the same as used for the initial hazard assessment.
2. For all **non-residential services**, the Purveyor will require the customer to submit to the Purveyor, within two months of purveyor notification, a hazard re-assessment (at the customer's expense) by a DOH-certified CCS.

The frequency of hazard re-assessments will be as shown in the table below:

Type of Service	Frequency of Re-Evaluation
Any services with reduced-pressure principle backflow assembly (RPBA) installed for premises isolation	None required as long as the RPBA passes annual tests and inspections
Commercial services with double-check valve assembly (DCVA) installed for premises isolation	Every two years and upon change in use or ownership
Commercial services when purveyor relies upon in-premises protection	Every two years and upon change in use, ownership, or plumbing system
Residential services with special plumbing where the purveyor relies upon compliance with Uniform Plumbing Code (UPC)	Every 2-3 years (questionnaire)
Residential services with DCVA installed for premises isolation	Every 4-5 years (questionnaire)
Residential services with no known special plumbing or water use on the premises	Every 4-5 years and upon change in use, ownership, or plumbing system (questionnaire)

The Purveyor will inform the customer that the Purveyor's survey of a customer's premises (whether by a representative of the Purveyor or through the evaluation of a questionnaire completed by the customer) is for the sole purpose of establishing the Purveyor's minimum requirements for the protection of the public water supply system, and that the required backflow protection will be commensurate with the Purveyor's assessment of the degree of hazard.

The Purveyor will also inform the customer or any regulatory agencies that the Purveyor's survey, requirements for the installation of backflow prevention assemblies, lack of requirements for the installation of backflow prevention assemblies, or other actions by the purveyor's personnel or agent do not constitute an approval of the customer's plumbing system or an assurance to the customer or any regulatory agency of the absence of cross connections.

Element 3: *Development and implementation of procedures and schedules for elimination and/or control of cross-connections.*

Backflow Preventer Requirements

The following service policy shall apply to all new and existing customers:

1. The Purveyor will require that water service to all **non-residential customers** be isolated at the meter by a DOH-approved DCVA or RPBA acceptable to the Purveyor. All high-hazard connections of the type described in Table 9 of WAC 246-290-490 shall be isolated with an RPBA. All other non-residential customers shall be isolated with a DCVA.

In lieu of isolation with a DCVA, other non-residential customers, with the concurrence of the Purveyor's CCS, may install in-premises protection commensurate with the degree of hazard, acceptable to the degree of hazard as determined by the Purveyor's CCS.

2. The Purveyor will require all **residential customers** with facilities of the type described in Table 9 of WAC 246-290-490 to be isolated with an RPBA. All other residential customers with special plumbing or water use on the premises will be isolated with a DCVA. "Special plumbing" includes, but is not limited to, the following:
 - a. A lawn irrigation system;
 - b. A solar heating system;
 - c. An auxiliary source of supply, e.g., a well or creek;
 - d. Piping for livestock watering, hobby farming, etc.;
 - e. Residential fire sprinkler system; and
 - f. Property containing a small boat moorage.
3. The Purveyor has chosen to supplement Table 9 of WAC 246-290-490(4) by identifying additional premises or premises types for which premises isolation is mandated. Such premises will include aircraft and automotive manufacturers, pulp and paper mills, military bases, tall buildings, premises with complex plumbing, premises with plumbing subject to frequent changes, plumbing with a repeat history of cross-connections being established or reestablished, premises with public swimming pool.
4. For all customers that have a written service contract with the Purveyor, the required premises isolation DCVA or RPBA shall be:
 - Purchased and installed by the customer (at the customer's expense) immediately downstream of the water meter in accordance with the Purveyor's standards described hereinafter; and
 - Maintained, tested, and inspected in accordance with the Purveyor's standards described hereinafter.

For new customers, the Purveyor will not turn on water (except for testing purposes) at the meter until the customer complies with the above requirements.

The failure of the customer to comply with the Purveyor's installation and maintenance requirements shall constitute a breach of contract by the customer. The Purveyor may then proceed with corrective action provisions stipulated in the contract.

5. **Customers without written contracts** are considered to have an implied contract that requires the customer to bear all reasonable costs of service. The Purveyor will install the required DCVA or RPBA on the service, upstream of the meter, and charge the customer for the cost of the initial installation, and all future maintenance, testing, and repair, as set forth in the Purveyor's schedule of rates and charges. The failure of the customer to pay these costs shall constitute a breach of contract by the customer, and the Purveyor will proceed with the established delinquency of payment procedures. As an alternative, the customer may sign a service contract and install the required backflow preventer downstream of the meter in accordance with the Purveyor's installation standards described hereinafter.

6. Approved Backflow Preventers and Installation

All backflow preventers relied upon by the Purveyor to protect the public water system shall meet the definition of "approved backflow preventer" as contained in WAC 246-290-010. The Purveyor will obtain and maintain a current list of assemblies approved for installation in Washington State from the DOH Office of Drinking Water.

All backflow preventers will be installed in:

- The orientation for which they are approved;
- A manner and location that facilitates their proper operation, maintenance, and testing or inspection;
- A manner that will protect them from weather-related conditions such as flooding and freezing; and
- Compliance with applicable safety regulations.

Installation standards contained in the most recently published edition of the Pacific Northwest Section, American Water Works Association (PNWS-AWWA) *CCC Manual* or the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (USCFCCCHR) *CCC Manual* shall be followed unless the manufacturer's requirements are more stringent.

The Purveyor has no regulatory responsibility or authority over the installation and operation of the customer's plumbing system. The customer is solely responsible for compliance with all applicable regulations and for prevention of contamination of his plumbing system from sources within his/her premises. Any action taken by the Purveyor to survey plumbing, inspect or test backflow prevention assemblies, or to require premises isolation (installation of DCVA or RPBA on service) is solely for the purposes of reducing the risk of contamination of the Purveyor's distribution system.

The Purveyor will inform the customer that any action taken by the Purveyor shall not be construed by the customer as guidance on the safety or reliability of the customer's plumbing system. The Purveyor will not provide advice to the customer on the design and installation of plumbing other than through the general public education program discussed in Element 8.

Except for easements containing the Purveyor's distribution system, the Purveyor will not undertake work on the customer's premises.

8. Schedule for Installation of Backflow Preventers

The following table shows the schedule that the Purveyor will follow for installation of backflow preventers when they are required (based on the hazard evaluation).

Type of Service	Schedule
New connections with cross-connection hazards	Before service is initiated
Existing connections with Table 9-type hazards and other high cross-connection hazards	Within 90 days after notification
Existing connections with other than Table 9 of WAC 246-290-490 or high cross-connection hazards	Within 180 days after notification (suggested)
Existing fire protection systems using chemicals or supplied by unapproved auxiliary water source	Within 90 days after notification
Existing fire protection systems not using chemicals and supplied by purveyor's water	Within 1 year after notification (suggested)

The Purveyor may consider granting an extension of time for installation of backflow preventer for an existing connection if requested by the premises owner.

Element 4: *Provision of qualified personnel, including at least one person certified as a CCS, to develop and implement the CCC program.*

1. **Program Administration:** The responsibility for administration of the CCC Program rests with the Purveyor. General policy direction and risk management decisions are established by the City Council.
2. The Purveyor will employ or have on staff at least one person certified by DOH as a CCS to develop and implement the CCC program. As an alternative, or when no staff or employees are properly qualified, the Purveyor may retain a DOH-certified CCS on contract to provide the necessary expertise and services.
3. The following cross-connection related tasks will be performed by or under the direction of the Purveyor's certified CCS (on staff or under contract):
 - Preparation of and recommendations regarding changes to the CCC program;
 - Performance of and/or reviews of CCC hazard evaluations;
 - Recommendations on the type of backflow preventer to be installed;
 - Recommendations on schedules for retrofitting of backflow preventers;
 - Inspections of backflow preventers for proper application and installation;
 - Reviews of backflow preventer inspection and test reports;
 - Reviews of backflow testing quality control information;
 - Recommendations and/or the granting of exceptions to mandatory premises isolation;
 - Participation in or cooperation with other water utility staff in the investigation of backflow incidents and other water quality problems;
 - Completion of Backflow Incident Reports; and
 - Completion of CCC Activity and Program Summary Reports.
4. The Purveyor may delegate other CCC program activities to other personnel who are not certified CCSs, including clerical support staff. These activities include:
 - Administration of paperwork associated with service agreements;
 - Mailing, collecting, and initial screening of hazard evaluation/water use questionnaires;
 - Mailing of assembly testing notices;
 - Receiving and screening of assembly testing reports;
 - CCC program database administration and record keeping;
 - Dissemination of public education material; and
 - Assisting tasks associated with coordination with the LAA.

5. The following table identifies the current CCS employed or retained on contract by the Purveyor to manage the Purveyor's CCC program and/or act as the CCC technical resource for the Purveyor:

Name of CCS	Brent R. Boone
Address	200 E Market St
City, State, Zip	Aberdeen, WA 98520
Telephone Number	(360) 537-3223
CCS Certification Number	10671

Element 5: *Development and implementation of procedures to ensure that approved backflow preventers are inspected and/or tested (as applicable).*

1. Inspection and Testing of Backflow Preventers

All backflow preventers that the Purveyor relies upon for protection of the water system will be subject to inspection and, if applicable, testing. This includes backflow preventers installed for in-premises protection that the Purveyor relies upon for protection of the water systems.

Inspection and testing of backflow preventers will be as follows:

- The Purveyor's DOH-certified CCS will inspect backflow preventers for proper application (i.e., to ensure that the preventer installed is commensurate with the assessed degree of hazard).
- Either a DOH-certified CCS or backflow assembly tester (BAT) will perform inspections of backflow preventers for correct installation.
- A DOH-certified backflow assembly tester will test all assemblies relied upon by the Purveyor to protect the public water system.

2. Frequency of Inspection and Testing

Inspection and testing of backflow preventers will be conducted:

- At the time of installation;
- Annually after installation;
- After a backflow incident; and
- After repair, reinstallation, relocation, or re-plumbing.

The Purveyor may require a backflow preventer to be inspected and/or tested more frequently than once a year, when it protects against a high-health hazard or when it repeatedly fails tests or inspections.

3. Responsibility for Inspection and Testing

The Purveyor will be responsible for inspection and testing of all purveyor-owned backflow preventers.

The Purveyor will require the customer to be responsible for inspection and testing of backflow preventers owned by the customer. The customer shall employ, at customer expense, a DOH-certified BAT pre-approved by the Purveyor to conduct the inspection and test within the time period specified in the testing notice sent by the Purveyor. The test report shall be completed and signed by the BAT, then countersigned and returned by the customer to the Purveyor, before the due date specified by the Purveyor. The customer may request an extension of the due date for returning a test report by submitting a written request to the Purveyor. The Purveyor may grant one extension up to 90 days.

4. Approved Test Procedures

The Purveyor will require that all assemblies relied upon to protect the public water system be tested in accordance with DOH-approved test procedures as specified in WAC 246-290-490(7)(d). Any proposal to use alternate test procedures must be approved by the Purveyor's CCS.

5. Notification of Inspection and/or Testing

The Purveyor will notify in writing all customers who own backflow preventers that are relied upon to protect the public water system to have their backflow preventer(s) inspected and/or tested. Notices will be sent out not less than 30 days before the due date of the inspection and/or test. The notice will also specify the date (up to 30 days after the due date of the inspection and/or test date) by which the inspection/test report must be received by the Purveyor.

6. Enforcement

When a customer fails to send in the inspection/test report within 15 days after the due date specified, and the Purveyor has not approved an extension to the due date, the Purveyor will take the following enforcement action:

- The Purveyor will send a second notice giving the customer an additional 15 days to send in the inspection/test report.
- If the customer has not sent in the inspection/test report within 10 days of the due date given in the second notice, the Purveyor will send a third notice, by certified mail, giving the customer an additional 15 days to send in the report. The notice will also inform the customer that failure to satisfactorily respond to this notice will result in water service shut-off.
- The Purveyor will send copies of the third notice to the owner and occupants of the premises (if different from the customer) and to the LAA.
- If the owner and/or occupants have not responded satisfactorily to the Purveyor within 10 days of the due date specified in the third notice, the Purveyor will implement water service shut-off procedures.
- The Purveyor may offer to arrange for the inspection and/or testing of the customer-owned backflow preventers by a certified BAT and will bill the customer the actual or typical cost of inspection and/or testing in the service area plus reasonable administrative costs. Collection and enforcement procedures for such charges will be the same as for other water utility charges.

Element 6: Development and implementation of a backflow prevention assembly testing quality assurance/quality control program.

1. List of Pre-Approved BATs

The Purveyor will maintain a list of local, DOH-certified BATs that are pre-approved by the Purveyor to perform the following activities:

- Backflow preventer inspection for proper installation; and
- Backflow assembly testing.

The list(s) will be revised annually or more frequently if necessary.

2. Pre-Approval Qualifications

BATs who wish to be included on the Purveyor's pre-approved list and/or provide testing in the Purveyor's service area must apply to the Purveyor and furnish the following information:

- Evidence of current DOH certification in good standing;
- Make and model of testing equipment;
- Evidence of test equipment verification of accuracy and/or calibration within the past 12 months;
- Evidence showing possession of a license to operate a business within the City of Aberdeen.

3. Quality Assurance

The Purveyor's CCS will review within 30 days of receipt the backflow preventer inspection/test report forms submitted by the customer. The Purveyor's CCS may accept reports that are signed

by a BAT not on the pre-approved CCS or BAT list provided that the same information as listed in "Pre-Approval Qualifications" is also submitted to the Purveyor.

The Purveyor's CCS will provide follow up on test reports that are deficient in any way.

The Purveyor's CCS will report incidences of fraud or gross incompetence on the part of any BAT or CCS to DOH Operator Certification program staff.

Element 7: *Development and implementation (when appropriate) of procedures for responding to backflow incidents.*

1. Backflow Incident Response Plan

The Purveyor's CCS will participate in developing a backflow incident response plan that will be part of the water system's emergency response program as required by WAC 246-290-415(2). The incident response plan will include, but will not be limited to:

- Notification of affected population;
- Notification and coordination with other agencies, such as DOH, the LAA, and the local health jurisdiction;
- Identification of the source of contamination;
- Isolation of the source of contamination and the affected area(s);
- Cleaning, flushing, and other measures to mitigate and correct the problem; and
- Apply corrective action to prevent future backflow occurrences.

2. Technical Resources

The Purveyor will use the most recently published edition of the manual, *Backflow Incident Investigation Procedures*, published by the PNWS-AWWA as a supplement to the Backflow Incident Response Plan for the City of Aberdeen.

Element 8: *Development and implementation of a cross-connection control public education program.*

1. Customer Education

The Purveyor will distribute with water bills or some other means, at regular intervals, public education brochures to system customers. For residential customers, such brochures will describe the cross-connection hazards in homes and the recommended assemblies or devices that should be installed by the homeowner to reduce the hazard to the public water system. The education program will emphasize the responsibility of the customer in preventing the contamination of the public water supply. The Purveyor's staff will produce the public education brochures or the Purveyor will obtain brochures from:

- PNWS-AWWA;
- Spokane Regional Cross-Connection Control Committee (SRC4);
- Western Washington Cross-Connection Prevention Professionals Group (The Group);
- USC FCCCHR;
- Other national backflow prevention associations, such as the American Backflow Prevention Association (ABPA); and/or
- Other water utilities.

The information distributed by the Purveyor will include, but not be limited to, the following subjects:

- Cross-connection hazards in general;
- Irrigation system hazards and corrective actions;
- Fire sprinkler cross-connection hazards;
- Importance of annual inspection and/or testing of backflow preventers; and
- Thermal expansion in hot water systems when backflow preventers are installed for premises isolation.

The Purveyor will distribute information brochures to all customers every two to three years, and to every new customer at the time the service agreement is signed.

Element 9: Development and maintenance of cross-connection control records.

1. Types of Records and Data to be Maintained

The Purveyor will maintain records of the following types of information required by WAC 246-290-490:

- Service connections/customer premises information including:
 - Assessed degree of hazard; and
 - Required backflow preventer to protect the public water system.
- Backflow preventer inventory and information including:
 - Air gap (AG) location, installation and inspection dates, inspection results and person conducting inspection;
 - Backflow assembly location, assembly description (type, manufacturer, make, model, size, and serial number), installation, inspection and test dates, test results and data, and person performing test; and
 - Information on atmospheric vacuum breakers used for irrigation system applications, including manufacturer, make, model, size, dates of installation and inspections, and person performing inspections.

The Purveyor will maintain records on all assemblies that protect the public water system from

contamination. At a minimum, the Purveyor will maintain records on all premises isolation assemblies required to protect the public water system. Where applicable, the above information will also be maintained for backflow preventers installed for in-premises protection that are relied upon by the Purveyor to protect the public water system.

2. Reports to be Prepared and Submitted to DOH

The Purveyor will prepare the following reports required by WAC 246-290-490 including:

- Cross-connection control program activities report for the calendar year, to be sent to DOH when requested;
- Cross-connection control program summary information, when required, or when there are significant policy changes;
- Backflow incident reports to DOH (and voluntarily to the PNWS-AWWA CCC Committee); and
- Documentation when exceptions to mandatory premises isolation are granted.

At a minimum, the Purveyor's CCS will prepare and sign the exceptions reports.

The Purveyor's CCS will prepare and sign all CCC-related reports required by WAC 246-290-490.

Element 10: Additional cross-connection control requirements for reclaimed water.

At this time the **City of Aberdeen** does not receive or distribute reclaimed water. In the event that reclaimed water use is proposed within the PWS's service area, the Purveyor will make all cross-connection control requirements mandated by the Permitting Authority in accordance with Chapter 90.46 RCW part of the written CCC program plan and comply with such additional requirements.

E. Other Provisions

1. Coordination with Local Administrative Authority

Both WAC 246-290-490 and the Uniform Plumbing Code amended for Washington require coordination between the water purveyor and the Local Administrative Authority (LAA) in all matters pertaining to cross-connection control.

The Purveyor will provide a copy of this CCC program to **LAA** via a copy of the Purveyor's water system plan or in a separate document. The Purveyor will inform the LAA of any changes in policy or procedure that may impact the LAA.

The Purveyor will provide information to the LAA in a timely manner regarding any:

- Requirement imposed on a residential customer for the installation of a DCVA or an RPBA on the service, with a description of the cross-connection hazard identified;

- Upgrade of the premises isolation backflow preventer, i.e., from a DCVA to an RPBA;
- Action taken to discontinue water service to a customer; and
- Backflow incident known by the Purveyor to have contaminated the public water system or a customer's plumbing system.

2. Written Agreement with Local Administrative Authority

The Purveyor will pursue development of a written agreement with the Local Administrative Authority regarding the details of the coordination on CCC issues between the two parties. The agreement will include, but not be limited to, the following items:

- The purpose of the written agreement;
- Identification of the parties and other interested agencies;
- Delineation of responsibilities;
- Procedures regarding new service connections;
- Procedures regarding existing and changes to existing services;
- Special policies and procedures, such as for fire protection and irrigation services;
- Procedures regarding water service shut-offs, backflow incidents, and other events;
- Communications between parties; and
- Other contingencies.

3. Prohibition of Return of Used Water. *The PWS must prohibit the intentional return of used water to the Purveyor's distribution system per WAC 246-290-490 (2)(l).*

Used water is defined as water that has left the control of the Purveyor. This includes water used for heating and cooling purposes and water that may flow back into the distribution system from customers with multiple connections.

It is the policy of the City of Aberdeen water system to:

- Prohibit the intentional return of used water to the distribution system by any customer served by the public water system; and
- Require that all customers with multiple connections, where the hydraulics permit the potential return of used water, to install a backflow preventer (DCVA or RPBA) commensurate with the degree of hazard at each point of connection.

4. Unapproved Auxiliary Supplies. *All water supplies other than those owned by the Purveyor are considered unapproved auxiliary supplies as defined in WAC 246-290-010. The Purveyor will require backflow protection for customers with auxiliary supplies on their premises as follows:*

- Per Table 9 of WAC 246-290-490, the Purveyor will require the installation of an RPBA for premises isolation at the service connection to any customer having an unapproved auxiliary supply on the premises that is interconnected with the Purveyor's water system.
- The Purveyor will require the installation of a DCVA for premises isolation at the service connection to any customer with an unapproved auxiliary water supply not interconnected with the Purveyor's water system.

5. **Tanker Trucks.** *The Purveyor may allow tanker trucks to obtain water from the Purveyor's water system under the following conditions:*
 - The tanker truck is equipped with an approved AG or an approved RPBA with a current satisfactory inspection or test report.
6. **Interties and Wholesale Water Customers.** *The Purveyor will require that interties with other public water systems or wholesale customers (such as mobile home parks) be isolated at the point of delivery by:*
 - A minimum of a DCVA; and
 - A minimum of an RPBA if the Purveyor considers the purchasing system or wholesale customer to pose a high-health hazard to the Purveyor's system.

The Purveyor may waive or reduce the level of protection at the intertie, if the purchasing public water system or wholesale customer:

- Is a Group A public water system not exempt from DOH regulation as per WAC 246-290-020(2);
- Has a CCC program that complies with WAC 246-290-490 and which has been approved by DOH; and
- Implements the CCC program at a level satisfactory to the Purveyor.”

F. Relationship to Other Planning and Operations Program Requirements

The Purveyor will consider the requirements and consequences of the CCC program on the utility's planning and operations requirements. Such considerations include, but are not limited to ensuring:

- And promoting adequate communication between CCC program personnel and other water utility staff;
- That adequate training is provided to all staff to recognize potential cross-connection control problems;
- That cross-connection issues be considered in water quality investigations;
- That the design of the water distribution system makes adequate provisions for expected head losses incurred through the installation of experienced by backflow assemblies;
- That CCC program personnel be consulted in the design of water and wastewater treatment facilities and when proposals are made to receive or distribute reclaimed water;
- That operations under normal and abnormal conditions do not result in excessive pressure losses; and
- That adequate financial and administrative resources are available to carry out the CCC program.

Backflow Incident Response Plan for City of Aberdeen Water System

A. General

This Backflow Incident Response Plan should be considered a supplement to the Purveyor's Emergency Plan.

Purveyors should immediately begin a backflow incident investigation whenever the initial evaluation of a water quality complaint indicates that:

1. A backflow incident has occurred (i.e., drinking water supply has been contaminated) or may have occurred; or
2. The complaint can't be explained as a "normal" aesthetic problem.

Also, whenever a water main break (or power outage for pumped systems) causes a widespread loss of water pressure in the system (creating backsiphonage conditions), purveyors should initiate a check of distribution system water quality as a precursor to the need for a backflow incident investigation.

WAC 246-290-490 requires purveyors to notify DOH, the Local Administrative Authority and local health jurisdiction as soon as possible, but no later than the end of the next business day when a backflow incident contaminates the potable water supply (in the distribution system and/or in the customer's plumbing system). Purveyors should include a list of emergency contact telephone numbers at the beginning of the water system's O & M Manual, so that the information is readily available when an incident occurs.

A backflow incident investigation is often a team effort. The investigation should be made by or initially led by the DOH-certified Cross-Connection Control Specialist employed by the Purveyor. The investigation team may include state health (regional) staff, local health personnel and/or local plumbing inspectors.

Purveyors can get more detailed guidance on how to respond to a backflow incident from the manual, *Backflow Incident Investigation Procedures*, published by the Pacific Northwest Section, American Water Works Association (PNWS-AWWA). Contact information for the PNWS-AWWA is provided in Appendix F.

B. Short List of Tasks

Small water system purveyors can use the following short list of tasks as initial guidance for dealing with backflow incidents. Purveyors should consult the most recently published edition of the PNWS-AWWA *Backflow Incident Investigation Procedures Manual* referenced above for greater detail as soon as possible after learning of a possible or confirmed backflow incident. Note: the water system is referred to

as the Purveyor in the short task list.

1. Customer Notification

- a. As soon as possible, the Purveyor will notify customers not to consume or use water.
- b. The Purveyor will start the notification with the customers nearest in location to the assumed source of contamination (usually the customer(s) making the water quality complaint).
- c. The Purveyor will inform the customer about the reason for the backflow incident investigation and the Purveyor's efforts to restore water quality as soon as possible. The Purveyor will let the customer know that customers will be informed when they may use water, the need to boil water used for consumption until a satisfactory bacteriological test result is obtained from the lab, etc.
- d. Where a customer cannot be contacted immediately, the Purveyor will place a written notice on the front door handle, and a follow-up visit will be made to confirm that the customer received notice about the possible contamination of the water supply.
- e. When dealing with a backflow incident, the Purveyor will let customers know that it could take several days to identify the source and type of contaminant(s) and to clean and disinfect the distribution system.

2. Identification of Source of Contamination

- a. The Purveyor will give consideration to the distribution system as a potential source of the contaminant (e.g., air valve inlet below ground).
- b. The Purveyor will not start flushing the distribution system until the source of contamination is identified (flushing may aggravate the backflow situation, and will likely remove the contaminant before a water sample can be collected to fully identify the contaminant).
- c. The Purveyor will conduct a house-to-house survey to search for the source of contamination and the extent that the contaminant has spread through the distribution system. Note: a check of water meters may show a return of water (meter running backward) to the distribution system.
- d. When the cross connection responsible for the system contamination is located, the Purveyor should discontinue water service to that customer until the customer completes the corrective action ordered by the Purveyor.

3. Isolation of Contaminated Portion of System

- a. The Purveyor will isolate the portions of the system that are suspected of being contaminated by closing isolating valves; leave one valve open to ensure that positive water pressure is maintained throughout the isolated system.

- b. The Purveyor will be sure to notify all affected customers in the isolated area first and then notify other customers served by the system.

4. Public Health Impacts

- a. The Purveyor will seek immediate input from and work with state and local health agencies to accurately communicate and properly mitigate potential health effects resulting from the backflow incident.
- b. If appropriate, the Purveyor will refer customers that may have consumed the contaminant or had their household (or commercial) plumbing systems contaminated to public health personnel and Local Administrative Authorities (plumbing inspectors).

5. Cleaning/Disinfecting the Distribution System

- a. The Purveyor will develop and implement a program for cleaning the contaminated distribution system consistent with the contaminant(s) identified.
- b. Where both chemical and bacteriological contamination has occurred, the Purveyor will disinfect the system after the removal of the chemical contaminant.
- c. Where any bacteriological contamination is suspected, the Purveyor will provide field disinfection.

C. Additional Information on Cleaning/Disinfecting the Distribution System

Most chemical or physical contaminants can be flushed from the water distribution system or customer's plumbing system with adequate flushing velocity. However, this may not be the case in systems where scale and corrosion deposits (e.g., tuberculation on old cast iron mains) provide a restriction to obtaining adequate flushing velocity, or where chemical deposits or bacteriological slimes (biofilm) are present (on which the chemical contaminant may adhere).

To remove a chemical or physical contaminant from the distribution system, purveyors may need to:

1. Physically clean the affected area using foam swabs (pigs); and/or
2. Alter the form of the chemical contaminant (e.g., through oxidation using chlorination or addition of detergents).

When adding any chemical (including chlorine) to remove a contaminant from the distribution system, it is essential that the Purveyor fully understand the chemistry of the contaminant. **Adding the wrong chemical could make the contaminant more toxic to customers and/or more difficult to remove from the distribution system.**

To disinfect water mains using the "slug" or "continuous flow" method, a field unit should be used for chlorine injection, such as a chemical feed - metering or proportioning pump for sodium hypochlorite. Purveyors should contact the appropriate DOH regional office to discuss proposed approaches to contaminant removal and disinfection prior to taking corrective action.

City of Aberdeen Cross Connection Control Program Administration Documents

Forms

- Backflow Assembly Testers - Pre-Approved for Submitting Test Reports;
- Preliminary Hazard Assessment Form – Non-Residential Customers;
- Cross-Connection Control Survey Report
- Water Use Surveys
- Backflow Incident Report Form.

Letters

- Request to Complete Water Use Questionnaire;
- Notice of Survey of Premises;
- Request to Install Backflow Prevention Assembly;
- Request to Submit Test of Backflow Prevention Assembly

Standard Installation Drawings

- Standard Details - Single Family Residential Service Connection Options; and
- Backflow Prevention Assemblies - Recommended Premises Isolation Installations.

Backflow Assembly Testers Pre-Approved for Submitting Test Reports to the City of Aberdeen

The following table lists Backflow Assembly Testers (BATs) that are pre-approved to test backflow assemblies in our water system's service area. We compiled the list by identifying individual testers who requested to work in this area or who previously submitted properly completed test reports to our system. *Note: listing does not constitute an endorsement of these BATs by our system or a certification of the quality of services they provide.*

To appear on our pre-approved BAT list, the tester must:

- Show proof of current BAT certification from DOH;
- Submit documentation that his/her assembly test equipment has been verified for accuracy within the last 12 months and calibrated if needed; and

As an alternative to the above, pre-approved testers must document that they appear on the approved BAT list of another nearby water system that has a testing QA/QC program acceptable to our system.

WAC 246-290-490 requires a DOH-certified BAT to test all assemblies (RPBA, RPDA, DCVA, etc.) that protect the distribution system. Assemblies that protect the public water system must be tested in accordance with DOH-approved field test procedures:

- Upon installation, and annually thereafter;
- After repair, reinstallation, or relocation; and
- After a backflow incident.

Note: the DOH BAT certification is a special certification separate from other waterworks operator certification categories, plumbing licenses, contractor registration, etc. Other licenses, certifications and/or registrations may be required to install backflow prevention assemblies and/or perform maintenance work on assemblies within buildings. However, only a currently DOH-certified BAT may test the assemblies that protect the public water system from contamination.

Name of Tester Company Name and Address	Phone Number	BAT Certificate Number
Doug Warnken Warnken's Water Works Hoquiam	(360) 532-8773	
Chris McMullen Northwest Water Works Aberdeen	(360) 532-2346	
McKinstry Company 5005 – 3rd Ave South Seattle WA 98124	(206) 762-5900	
Knight Fire Protection, Inc. 9702 Lathrop Industrial Drive SW Olympia WA 98512-9188	(360) 786-8606	
Chuck Singleton Tri-Co Backflow Rochester WA 98579	(360) 250-0694	

Preliminary Cross-Connection Control Hazard Assessment Form

Non-Residential Customers

Name of Customer or Business: _____

Address: _____

Phone Number: _____

Description of Business: _____

Is your business or premises of a type included in the table below (check all that apply)?

Agricultural (farm or dairy)	Metal plating industry	
Beverage bottling plant	Mortuary	
Car wash	Petroleum processing or storage plant	
Chemical plant	Pier or dock	
Commercial laundry or dry-cleaners	Radioactive material processing plant or nuclear reactor	
Having both reclaimed water and potable water provided	Survey access denied or restricted	
Film processing facility	Wastewater lift station or pumping station	
Food processing plant	Wastewater treatment plant	
Hospital, medical center, nursing home, veterinary, medical, or dental clinic, or blood plasma center	Having an unapproved auxiliary water supply interconnected with the potable water supply	
Having separate irrigation system using purveyor's water and adding chemicals*	Other (describe) <i>[Purveyor to add other types of premises considered to be high-hazard]</i>	
Laboratory	Other (describe) <i>[See above]</i>	

*e.g., parks, playgrounds, golf courses, cemeteries, estates, etc.

Other potential cross-connection concerns:

- Irrigation system
- Fire sprinkler system, using not using chemicals or anti-freeze
- Swimming pool
- Other (describe): _____

Note to Customer: This form is used for preliminary assessment only. The water purveyor may require a more thorough assessment at a later date.

This form was completed by (print name): _____ Date: _____

Please return completed form by {insert date} and send to: City of Aberdeen

Cross-Connection Control Survey Report

Surveyor's Recommendations

I certify that this cross-connection hazard survey accurately reflects the overall risk posed by the customer's plumbing system to the Purveyor's distribution system. Based on the above survey, I certify that:

1. I found the following type(s) of premises isolation backflow preventer(s):

Air Gap RPBA/RPDA DCVA/DCDA None .

2. The existing backflow preventer(s) is/are properly installed.

Yes No N/A .

3. The existing backflow preventer(s) is/are commensurate with the degree of hazard.

Yes No N/A .

4. Since no backflow preventer was installed for premises isolation, the premises owner should install a premises isolation backflow preventer of the following type:

Air Gap RPBA/RPDA DCVA/DCDA N/A .

5. The premises owner should replace the existing premises isolation backflow preventer(s) with the following:

Air Gap RPBA/RPDA DCVA/DCDA N/A .

The completed survey report shall be first signed by the CCS conducting the survey, and then counter-signed by the owner of the premises or the owner's authorized agent.

CCS Signature: _____ Date: _____

As the Owner of the Premises (or Owner's authorized agent), I certify that I have received a copy of this completed Cross-Connection Control Hazard Survey Report.

Signature: _____ Date: _____

Note: Customers and regulatory agencies should be aware that the Purveyor's requirement for this cross-connection hazard survey and/or for the installation of a specific backflow prevention assembly on a service pipe *do not* constitute an approval of the customer's plumbing system, compliance of the customer's plumbing system with the Uniform Plumbing Code or an assurance of the absence of cross connections in the customer's plumbing system.

Water Use Survey
Residential (Single Family / Duplex) Water Service

IMPORTANT

WATER METER(S) WILL NOT BE
SCHEDULED FOR INSTALLATION
UNTIL THE ATTACHED INFORMATION IS
COMPLETED, RETURNED, AND APPROVED
BY THE CITY OF ABERDEEN WATER
DEPARTMENT WATER QUALITY DIVISION

DO NOT DELAY

Water Use Survey

Application for Residential (Single Family / Duplex) Water Service

WATER METER(S) WILL NOT BE SCHEDULED FOR INSTALLATION UNTIL THE ATTACHED INFORMATION IS COMPLETED, RETURNED, AND APPROVED BY THE CITY OF ABERDEEN WATER DEPT - WATER QUALITY DIVISION.

RETURN THIS APPLICATION TO:

City of Aberdeen Water Dept
Attn: Water Quality Division
200 E Market St
Aberdeen, WA 98520

Phone: (360) 537-3223
Fax: (360) 537-3350

DATE _____ METER APPLICATION # _____
WATER SERVICE ADDRESS _____
PROPERTY OWNER'S NAME _____ PHONE: _____
MAILING ADDRESS _____
MAILING CITY _____ STATE _____ ZIP _____

The undersigned applicant hereby applies for water connection(s) to the above-described property. The applicant is the owner of the described property. By signing this application, the applicant agrees, as a condition of City of Aberdeen Water Dept. providing and continuing water service to the above described property, to comply with all provisions of code 13.56.020, 13.56030 (or latest revision thereof) and other such rules and regulations now existing or which may be established from time to time governing the City of Aberdeen Water public water system.

The applicant understands that there shall be separate water service connections for fire systems and domestic water systems (other than flow-through fire protection systems that are supplied only by the purveyor's water; do not have a fire department pumper connection; are constructed of approved potable water piping and materials to which sprinkler heads are attached; and terminates at a connection to a toilet or other plumbing fixture to prevent the water from becoming stagnant). Separate water service connections may also be required for irrigation systems.

The applicant specifically agrees to install and maintain at all times their plumbing system in compliance with the most current edition of the Uniform Plumbing Code having jurisdiction as it pertains to the prevention of water system contamination and prevention of pressure surges and thermal expansion in their water piping.

Further, the applicant agrees not to make a claim against City of Aberdeen Water Dept. or employees for damages and/or loss of production. *The city reserves the right at any time, without notice, to shut off the water supply for repairs, extensions, nonpayment of rates, or any other reason, and the city shall not be responsible for any damages, such as bursting of boilers, supplied by direct pressure, the breaking of any pipes, or fixtures, stoppages or interruption of water supply, or any other damages, resulting from the shutting off of the water.*
(code 13.56.340)

APPLICANT'S SIGNATURE _____ DATE ____ / ____ / ____

Section 13.56.020 Application for service.

An owner of residential property desiring to connect with the water supply of the city of Aberdeen shall present at the office of the water department a copy of the building permit or a regular certified copy of it from the superintendent of buildings, containing his name, description of lot, block and addition and the official house number of the premises on which water is desired, and shall make application therefor upon a printed form to be furnished for that purpose, which application shall contain the description of the premises where such water is desired, shall state fully all of the purposes for which the water is to be used, the number of families to be supplied and the size of the service pipe, and shall be signed by the owner of the premises to be served, and shall be filed in the office of the superintendent, and at the time of filing such application the applicant shall pay to the city treasurer, and take his receipt therefor, the fees for installation of water service as provided in this chapter. (Prior code § 10.18.020)

Section 13.56.030 Application--Contract provisions.

The application provided for in Section 13.56.020 shall contain a contract on the part of the person making the same to pay for the water applied for at the rate and in the manner specified in such contract, and shall reserve to the city of Aberdeen the right to charge and collect the rates and enforce the penalties provided for in this chapter, in the manner herein provided, to change the rates at any time by ordinance, to temporarily discontinue the service at any time without notice to the consumer and to install a meter or meters to register the water consumed, and shall specify that said contract is subject to all the provisions of this chapter and of any ordinance of the city of Aberdeen relating to the subject hereafter passed, and shall provide that the city of Aberdeen shall not be held responsible for any damage by water or other cause resulting from defective plumbing or appliances on the premises supplied with water installed by the owner or occupant of said premises, and that the fact that the agents of the city have inspected the plumbing and appliances shall not be pleaded as a basis of recovery in case of damage to premises from defective plumbing or appliances installed by the owner or occupant of such premises, and shall provide that in case the supply of water is interrupted or fails by reason of accident or any other cause whatsoever, the city shall not be liable for damages for such interruption or failure, nor shall such failure or interruption for any reasonable period of time be held to constitute a breach of contract on the part of the city or in any way relieve the consumer from performing the obligations of his contract. (Prior code § 10.18.030)

Water Use Survey

CITY OF ABERDEEN WATER DEPT

Residential (Single Family / Duplex) - Water Usage Questionnaire

PLEASE RETURN THIS COMPLETED FORM TO:

CITY OF ABERDEEN WATER DEPT

Attn: Water Quality Division
200 E Market St.
Aberdeen, WA 98520

Name _____

Meter Application # _____

Property Address _____

City _____ State _____ Zip Code _____

(Complete If Different)

Property Owner _____ Phone _____

Mailing Address _____

Mailing City _____ State _____ Zip Code _____

(1) Please indicate if your residence has, or will have, any of the following:

Auxiliary Water System _____ Yes No Fire System (no chemical addition) _____ Yes No
(well, pond, creek, other)

Solar hot water heating system _____ Fire System (with chemical addition) _____

Home three stories or more tall _____ Irrigation System (no chemical addition) _____

Thermal Expansion Tank _____ Irrigation System (with chemical addition) _____
(located on hot water tank)

Radiant heat system _____
(with chemical addition)

(2) Are you aware of any existing backflow protection located at this property?

Please describe _____

Name of person completing this form _____

THIS SECTION TO BE COMPLETED BY THE WATER QUALITY DIVISION

TYPE OF WATER USE	HAZARD ASSESSMENT		BACKFLOW PROTECTION REQUIRED				
	LOW	HIGH	DCVA	DCDA	RPBA	RPDA	Dual Chk
DOMESTIC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IRRIGATION	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FIRE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

BACKFLOW REQUIRED? YES NO CCS INITIALS

Water Use Survey

Multi-Family (*Tri-Plex or more*) / Commercial /
Industrial / Fire / Irrigation / Construction Water

IMPORTANT

WATER METER(S) WILL NOT BE
SCHEDULED FOR INSTALLATION
UNTIL THE ATTACHED INFORMATION IS
COMPLETED, RETURNED, AND APPROVED
BY THE CITY OF ABERDEEN WATER
DEPARTMENT WATER QUALITY DIVISION

DO NOT DELAY

Water Use Survey

Application for Multi-Family (*Tri-Plex or more*) / Commercial / Industrial / Fire / Irrigation / Construction Water

WATER METER(S) WILL NOT BE SCHEDULED FOR INSTALLATION UNTIL THE ATTACHED INFORMATION IS COMPLETED, RETURNED, AND APPROVED BY THE CITY OF ABERDEEN WATER DEPT - WATER QUALITY DIVISION.

RETURN THIS APPLICATION TO:

City of Aberdeen Water Dept
Attn: Water Quality Division
200 E Market St
Aberdeen, WA 98520

Phone: (360) 537-3223
Fax: (360) 537-3350

DATE _____ METER APPLICATION # _____

WATER SERVICE ADDRESS _____

PROPERTY OWNER'S NAME _____ PHONE: _____

MAILING ADDRESS _____

MAILING CITY _____ STATE _____ ZIP _____

The undersigned applicant hereby applies for water connection(s) to the above-described property. The applicant is the owner of the described property. By signing this application, the applicant agrees, as a condition of City of Aberdeen Water Dept. providing and continuing water service to the above described property, to comply with all provisions of code 13.56.020, 13.56030 (or latest revision thereof) and other such rules and regulations now existing or which may be established from time to time governing the City of Aberdeen Water public water system.

The applicant understands that there shall be separate water service connections for fire systems and domestic water systems (other than flow-through fire protection systems that are supplied only by the purveyor's water; do not have a fire department pumper connection; are constructed of approved potable water piping and materials to which sprinkler heads are attached; and terminates at a connection to a toilet or other plumbing fixture to prevent the water from becoming stagnant). Separate water service connections may also be required for irrigation systems.

The applicant specifically agrees to install and maintain at all times their plumbing system in compliance with the most current edition of the Uniform Plumbing Code having jurisdiction as it pertains to the prevention of water system contamination and prevention of pressure surges and thermal expansion in their water piping.

Further, the applicant agrees not to make a claim against City of Aberdeen Water Dept. or employees for damages and/or loss of production. *The city reserves the right at any time, without notice, to shut off the water supply for repairs, extensions, nonpayment of rates, or any other reason, and the city shall not be responsible for any damages, such as bursting of boilers, supplied by direct pressure, the breaking of any pipes, or fixtures, stoppages or interruption of water supply, or any other damages, resulting from the shutting off of the water.*

(code 13.56.340)

APPLICANT'S SIGNATURE _____ DATE _____ / _____ / _____

Water Use Survey

CITY OF ABERDEEN WATER DEPT.

Family / Commercial / Industrial / Fire / Irrigation / Construction / Water Usage Question

PLEASE RETURN THIS COMPLETED FORM TO:

**City of Aberdeen Water Dept
Attn: Water Quality Division
200 E Market St
Aberdeen, WA 98520**

Today's Date _____

Meter Application # _____

Project Name _____ Developer Ext # _____

Business Name _____

Business Type _____

Physical Property Address _____

City _____ State _____ Zip code _____

Property Owner _____

Mailing Address _____

Mailing City _____ State _____ Zip code _____

Contact Person _____ Phone Number _____

(1) Please indicate if your facility has, or will have, any of the following:

	Yes	No		Yes	No
Air conditioning system	<input type="checkbox"/>	<input type="checkbox"/>	Chemical feed tank for industrial process	<input type="checkbox"/>	<input type="checkbox"/>
Air washer	<input type="checkbox"/>	<input type="checkbox"/>	Chemical feed (<i>commercial cleaners</i>)	<input type="checkbox"/>	<input type="checkbox"/>
Aquarium make-up water	<input type="checkbox"/>	<input type="checkbox"/>	Chlorinators	<input type="checkbox"/>	<input type="checkbox"/>
Aspirator, chemical <i>(Herbicide, pesticide, weedicide)</i>	<input type="checkbox"/>	<input type="checkbox"/>	Computer cooling lines	<input type="checkbox"/>	<input type="checkbox"/>
Aspirator, Medical / lab	<input type="checkbox"/>	<input type="checkbox"/>	Condensate tanks	<input type="checkbox"/>	<input type="checkbox"/>
Autoclave	<input type="checkbox"/>	<input type="checkbox"/>	Cooling towers	<input type="checkbox"/>	<input type="checkbox"/>
Autopsy table	<input type="checkbox"/>	<input type="checkbox"/>	Decorative ponds	<input type="checkbox"/>	<input type="checkbox"/>
Auxiliary Water System <i>(Well, pond, creek, other)</i>	<input type="checkbox"/>	<input type="checkbox"/>	Degreasing equipment	<input type="checkbox"/>	<input type="checkbox"/>
Baptismal fountain	<input type="checkbox"/>	<input type="checkbox"/>	Dental equipment / cuspidors	<input type="checkbox"/>	<input type="checkbox"/>
Bathtub, below rim filler	<input type="checkbox"/>	<input type="checkbox"/>	Dialysis equipment	<input type="checkbox"/>	<input type="checkbox"/>
Bedpan washer	<input type="checkbox"/>	<input type="checkbox"/>	Dye vats and tanks	<input type="checkbox"/>	<input type="checkbox"/>
Beverage dispenser (<i>post-mix Co2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	Etching tanks	<input type="checkbox"/>	<input type="checkbox"/>
Boiler feed lines	<input type="checkbox"/>	<input type="checkbox"/>	Fermenting tanks	<input type="checkbox"/>	<input type="checkbox"/>
Bottle washing equipment	<input type="checkbox"/>	<input type="checkbox"/>	Fertilizer injection	<input type="checkbox"/>	<input type="checkbox"/>
Box hydrant (<i>irrigation</i>)	<input type="checkbox"/>	<input type="checkbox"/>	Film processors	<input type="checkbox"/>	<input type="checkbox"/>
Building three stories or more tall	<input type="checkbox"/>	<input type="checkbox"/>	Fire Department pumper connections	<input type="checkbox"/>	<input type="checkbox"/>
Car wash	<input type="checkbox"/>	<input type="checkbox"/>	Fire system (<i>with booster pump</i>)	<input type="checkbox"/>	<input type="checkbox"/>
Fume hoods (<i>lab</i>)	<input type="checkbox"/>	<input type="checkbox"/>	Fire system (<i>without chemicals</i>)	<input type="checkbox"/>	<input type="checkbox"/>
Garbage can washers	<input type="checkbox"/>	<input type="checkbox"/>	Fire system (<i>with antifreeze or chemicals</i>)	<input type="checkbox"/>	<input type="checkbox"/>
			Livestock drinking tanks	<input type="checkbox"/>	<input type="checkbox"/>
			Make-up tanks	<input type="checkbox"/>	<input type="checkbox"/>

Water Use Survey

	Yes	No		Yes	No
Heat exchangers <i>(other than double wall with leak path)</i>	<input type="checkbox"/>	<input type="checkbox"/>	Photo developing sinks / tanks	<input type="checkbox"/>	<input type="checkbox"/>
Heat pumps	<input type="checkbox"/>	<input type="checkbox"/>	Pump prime lines	<input type="checkbox"/>	<input type="checkbox"/>
High pressure washers	<input type="checkbox"/>	<input type="checkbox"/>	Radiant heat system (with chemicals)	<input type="checkbox"/>	<input type="checkbox"/>
Hot tubs (<i>direct water connection</i>)	<input type="checkbox"/>	<input type="checkbox"/>	Radiator flushing equipment	<input type="checkbox"/>	<input type="checkbox"/>
Hot water heating boilers	<input type="checkbox"/>	<input type="checkbox"/>	Recreational vehicle sewage dump	<input type="checkbox"/>	<input type="checkbox"/>
Hydrotherapy baths	<input type="checkbox"/>	<input type="checkbox"/>	Sewer connected equipment	<input type="checkbox"/>	<input type="checkbox"/>
Ice makers	<input type="checkbox"/>	<input type="checkbox"/>	Solar water heating system	<input type="checkbox"/>	<input type="checkbox"/>
Industrial fluid systems	<input type="checkbox"/>	<input type="checkbox"/>	Spas	<input type="checkbox"/>	<input type="checkbox"/>
Irrigation system (<i>no chemicals</i>)	<input type="checkbox"/>	<input type="checkbox"/>	Steam generating equipment	<input type="checkbox"/>	<input type="checkbox"/>
Irrigation system (<i>chemical</i>)	<input type="checkbox"/>	<input type="checkbox"/>	Stills	<input type="checkbox"/>	<input type="checkbox"/>
Laboratory equipment	<input type="checkbox"/>	<input type="checkbox"/>	Swimming pools	<input type="checkbox"/>	<input type="checkbox"/>
Laundry machines (<i>commercial</i>)	<input type="checkbox"/>	<input type="checkbox"/>	Trap primers	<input type="checkbox"/>	<input type="checkbox"/>
			Used, reclaimed or gray water systems	<input type="checkbox"/>	<input type="checkbox"/>
			X-ray equipment	<input type="checkbox"/>	<input type="checkbox"/>

(2) Are you aware of any existing backflow protection located at this property?

Please describe _____

(3) Please provide the name of all products or chemicals that are mixed with water at your location:

(4) Please provide the name of all products or chemicals that are stored in bulk at your location:

Name of person completing this form _____

THIS SECTION TO BE COMPLETED BY THE WATER QUALITY DIVISION							
TYPE OF WATER USE	HAZARD ASSESSMENT		BACKFLOW PROTECTION REQUIRED				
	LOW	HIGH	DCVA	DCDA	RPBA	RPDA	LOCK
DOMESTIC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
IRRIGATION	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
FIRE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
BACKFLOW REQUIRED?		<input type="checkbox"/> YES	<input type="checkbox"/> NO	CCS INITIALS			

Backflow Incident Report Form

Many backflow incidents occur that are not reported. This is usually because:

- The incidents are of short duration;
- The incidents are not detected;
- Neither the customer nor the Purveyor realizes that a contamination was caused by a backflow incident;
- The customer is not aware the incident should be reported;
- Customers do not know who to report the incidents to; and/or
- Liability concerns on the part of either the customer or purveyor or both.

DOH and the PNWS-AWWA Cross-Connection Control Committee are making an effort to bring backflow incidents to the attention of water purveyors, Local Administrative Authorities, legislators, and the general public. If you have any knowledge of a backflow incident, please fill out a copy of the Backflow Incident Report Form and return it to DOH and the PNWS-AWWA CCC committee.

Backflow Incident Report Form

Reporting Agency: _____ Report Date: _____

Reported By: _____ Title: _____

Mail Address: _____ City: _____

State: _____ Zip Code: _____ Telephone: _____

Date of Incident: _____ Time of Occurrence: _____

General Location (Street, etc.): _____

Backflow Originated From:

Name of Premises: _____

Street Address: _____ City: _____

Contact Person: _____ Telephone: _____

Type of Business: _____

Description of Contaminants:

(Attach Chemical Analysis or MSDS if available)

Distribution of Contaminants:

Contained within customer's premises: Yes: _____ No: _____

Number of persons affected: _____

Effect of Contamination:

Illness Reported: _____

Physical irritation reported: _____

Backflow Incident Report Form

Page 2 of 3

Cross-Connection Source of Contaminant (boiler, chemical pump, irrigation system, etc.):

Cause of Backflow (main break, fire flow, etc.):

Corrective Action Taken to Restore Water Quality (main flushing, disinfection, etc.):

Corrective Action Ordered to Eliminate or Protect from Cross Connection (type of backflow preventer, location, etc.)

Previous Cross-Connection Survey of Premises:

Date: _____ By: _____

Types of Backflow Preventer Isolating Premises:

RPBA: _____ RPDA: _____ DCVA: _____ DCDA: _____ PVBA: _____ SVBA: _____

AVB: _____ Air Gap: _____ None: _____ Other Type: _____

Date of Latest Test of Assembly: _____

Backflow Incident Report Form

Notification of Washington State Health Department:

Date: _____ Time: _____ Person Notified: _____

Attach sheets with additional information, sketches, and/or media information, and mail to:

PNWS-AWWA CCC Committee

c/o George Bratton

1252 S. Farragut Drive

Coupeville, WA 98239

Letter Requesting Customer to Complete Water Use Questionnaire

Date

Customer Account Number (optional)

Customer

Customer Address Line 1

Customer Address Line 2

Dear City of Aberdeen Water System Customer:

Washington State drinking water regulations, WAC 246-290-490, require public water systems to develop and implement cross-connection control programs. Cross-connection control programs help protect public health by preventing contamination of the drinking water as it is delivered to water system customers. The attached brochure explains what a cross connection is, describes typical household cross connections and what you can do to help protect your drinking water.

As part of our efforts to keep your drinking water safe, we are conducting a cross-connection control hazard survey of residential customers served by our system. The purpose of the survey is to help us determine if any of our residential customers have special plumbing or activities on their premises that could increase the risk of contamination to our water system.

For most residential customers, the cross-connection control hazard posed to the public water system is minimal. This is because your household plumbing was installed in compliance with the Uniform Plumbing Code. The Uniform Plumbing Code generally provides adequate protection of your water potable water piping and our public water distribution system from cross connections. However, a few customers with special plumbing or activities on their premises may pose an increased health risk to other customers served by our system. These customers may need to have a backflow preventer installed on their service lines or provide alternate protection to prevent contamination of the public water system.

Please complete the attached questionnaire by checking the applicable boxes on the table; and return the completed, signed questionnaire by {insert date} to the address shown on the letterhead.

Thanks in advance for filling out the questionnaire. We appreciate your cooperation in helping us to protect the drinking water we deliver to our customers. If you have any questions about the survey or how to fill out the questionnaire, please contact me. We will review your questionnaire and determine whether we need to contact you for further information.

Sincerely,

Brent R. Boone
Water Customer Service Supervisor
Aberdeen Water Department
Aberdeen WA 98520
(360) 537-3223

Enclosures: CCC Brochure
Water Use Questionnaire

Notice of Survey of Premises (Non-Residential/Multi-Family Residential) Customer-Employed Cross-Connection Control Specialist

Date

Customer Account Number (optional)

Customer Name

Customer Address Line 1

Customer Address Line 2

Dear City of Aberdeen Water System Customer:

Washington State drinking water regulations, WAC 246-290-490, require public water systems to develop and implement cross-connection control programs. Cross-connection control programs protect public health by preventing contamination of the drinking water supply. The attached brochure explains what a cross connection is and what you can do to help protect your drinking water.

As part of the cross-connection control program, our system must assess the degree of hazard posed by each of our customer's plumbing systems upon the public water system. Non-residential customers and multi-family residential customers pose a special concern, because of the greater scope and complexity of their plumbing systems, special uses of water on the premises (e.g., manufacturing), fire protection systems, etc. Depending on the hazard assessment results, you may need to have a backflow preventer installed on your service line or provide alternate protection.

A cross-connection survey needs to be conducted for us to make the hazard assessment for your premises. The drinking water regulations require a person with special training, i.e., a Department of Health certified Cross-Connection Specialist (CCS), to conduct the surveys. Our system's policy is to have surveys of all non-residential premises and multi-family residential premises conducted by a CCS *employed by the customer*. Survey results must be submitted to our system for review.

Please arrange for the attached survey form to be completed and returned to this office by {insert date}. A list of local CCSs who provide this type of service is attached.

We appreciate your cooperation in meeting this hazard survey requirement. If you have any questions, please contact me.

Sincerely,

Brent R. Boone
Water Customer Service Supervisor
Aberdeen Water Department
Aberdeen WA 98520
(360) 537-3223

Enclosures: CCC Brochure
Water Use Questionnaire
CCS List

Request to Install Backflow Prevention Assembly

Date

Customer Account Number (optional)

Customer Name

Customer Address Line 1

Customer Address Line 2

Dear City of Aberdeen Water System Customer:

Washington State drinking water regulations, WAC 246-290-490, require public water systems to develop and implement cross-connection control programs. Cross-connection control programs protect public health by preventing contamination of the drinking water as it is delivered to people served by the water system. **The purpose of this letter is to inform you of a requirement to install a backflow assembly.**

Our water system's policy considers each of our customer's plumbing systems, starting from the termination of the service pipe downstream of the water meter, to pose a potential cross-connection hazard to the public water system. Our policy requires a backflow prevention assembly commensurate with the degree of hazard to be installed on the service line. The purpose of this backflow prevention assembly is to isolate your plumbing system from the water distribution system. We've attached a copy of Ordinance 5986 describing our cross-connection control policy.

We have received the cross-connection control survey report submitted by your Cross-Connection Control Specialist (CCS). The survey assessed the overall public health hazard posed by your plumbing system (and water use) to the public water system. We agree with the assessment made by the CCS. **Based on the assessment, a Department of Health-approved {insert type of assembly} is required to be installed on your service line (at a location downstream of the water meter).**

Please make arrangements for the assembly to be installed by {insert date} or when your plumbing system is modified, whichever comes sooner. We realize that this expense was not anticipated, so if you are unable to comply with this deadline, please contact us to discuss an alternative date. We've enclosed a copy of our standard installation drawings for this type of assembly. Your CCS should oversee the installation of the assembly to ensure compliance with these standards.

We appreciate your cooperation in this matter. If you have any questions, please contact me.

Sincerely,

Brent R. Boone
Water Customer Service Supervisor
Aberdeen Water Department
Aberdeen WA 98520
(360) 537-3223

cc: {City Plumbing Inspector}

Enclosures: Standard Installation Drawings

Request to Submit Test of Backflow Prevention Assembly

Date

<<Business_Name>>
<<Attn>>
<<Address_1>>
<<Address_2>>
<<City>> <<State>>, <<Zip_Code>>

Re: Annual Backflow Device Testing

Location(s): <<Device_Location_1>>
<<Device_Location_2>>
<<Device_Location_3>>

Dear <<Business_Name>>:

It is time for the annual testing of the backflow prevention device(s) connected to the potable water supply at your location. Our records indicate there is a total of <<Device_Number>> device(s).

It is the customer's responsibility to have the backflow preventer(s) tested by a certified tester and for the customer to return the completed test results no later than <<Date>>.

We will only accept test results from testers who have submitted documentation to verify their BAT Certification. Test reports will not be accepted, unless the BAT has provided documentation (proof of insurance, test equipment (differential) and date of calibration, and proof of current City of Aberdeen business license) to the Cross Connection Control Specialist. Test reports submitted by a non-verified tester will be denied and the device will have to be re-tested.

Failure to return the test results by the deadline may result in termination of water service, until the test results are received (Aberdeen City Code 13.56.620). Note: If the device fails the test, it must be repaired, re-tested and the test report submitted by the deadline.

Sincerely,

Brent R. Boone
Water Customer Service Supervisor
Aberdeen Water Department
Aberdeen WA 98520
(360) 537-3223

Enclosure: (1)

Standard Installation Drawings

The following pages show typical premises isolation installations of backflow assemblies (Illustrations 5 and 6).

Illustration 5
Standard Details - Service Connection Options
Single Family Residential

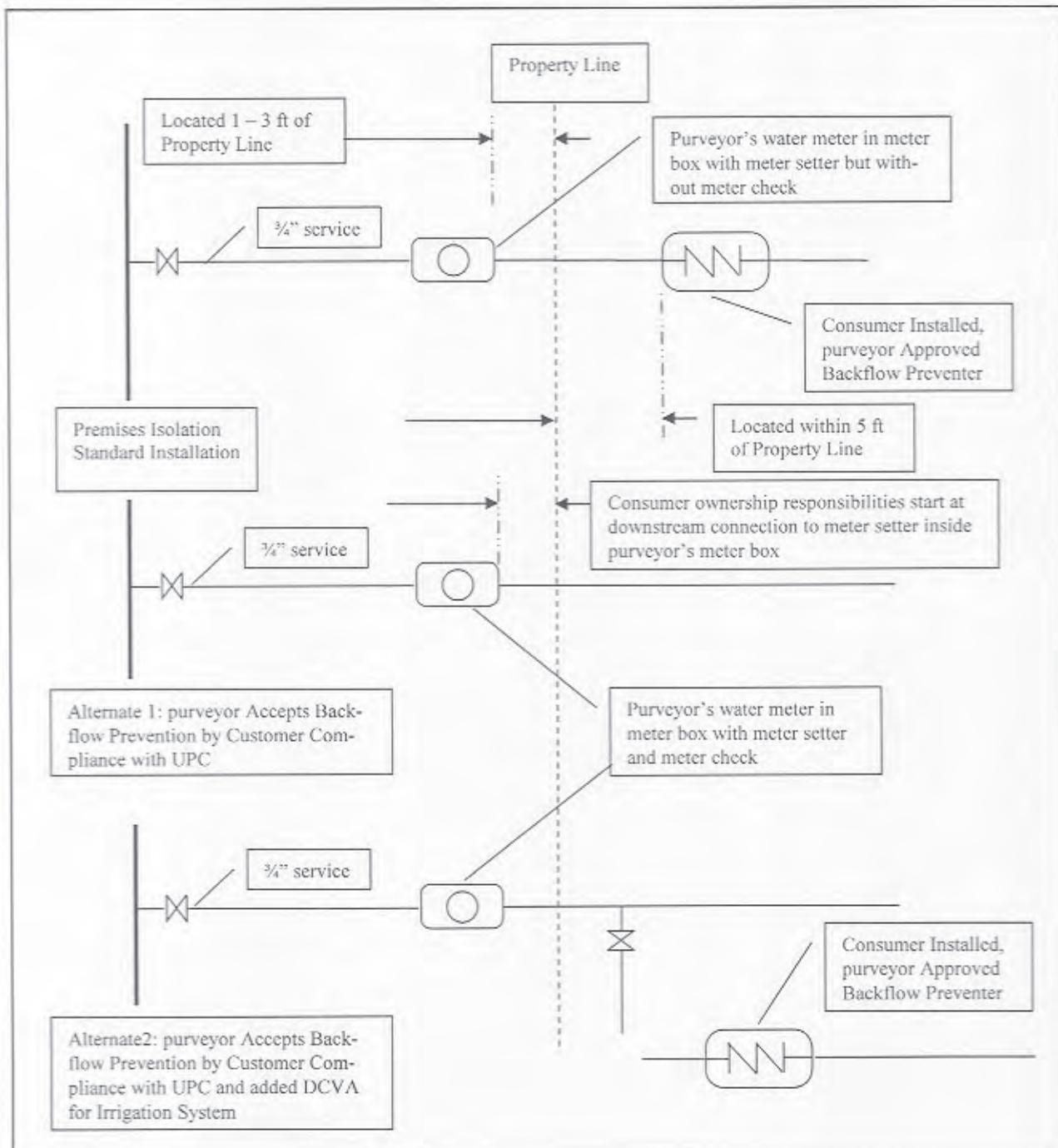
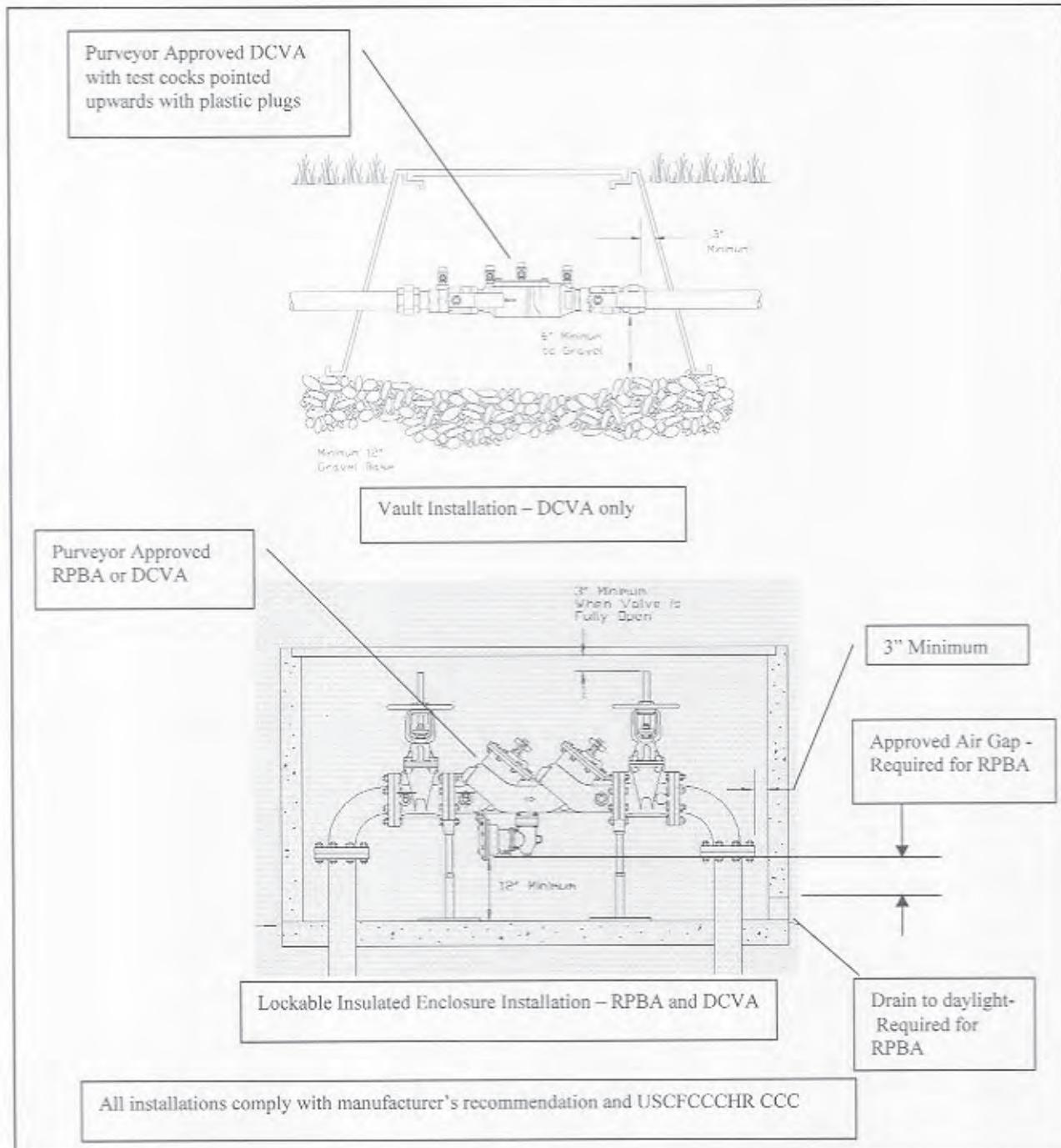


Illustration 6
Backflow Prevention Assemblies
Recommended Premises Isolation Installations



Appendix M

Water System Contingency Plan

City of Aberdeen Water System Contingency Plan

Priority Service List

The City maintains and regularly updates a Priority Service List that identifies and protects individuals or organizations that depend on an uninterrupted supply of water, strict water quality requirements, or both. Public information and education materials include references to these services in order to encourage those in need of enhanced water service quality or reliability to contact the City for inclusion on the list. Possible candidates for this service might include individuals on home-care kidney dialysis equipment or other medical facilities and organizations requiring uninterrupted water for specialized commercial or industrial processes.

Notification DOH

The Water Systems Manager, or his/her designee, is prepared to immediately notify the DOH District Engineer in the event that water shutdown is threatened or necessary for more than 24 hours, water quality is determined to be unacceptable, or whenever a public health risk associated with the water system is detected.

Material Supplies

The City maintains a computerized inventory of repair and replacement parts that permits an immediate determination of available materials on hand for responding to an emergency. The inventory is updated regularly as purchase invoices and crew usage reports are received. The quantity and type of materials in storage are checked periodically against the computer printout to ensure accuracy.

Priorities

When used for potable water functions such as drinking, cooking, and personal hygiene, water quality should meet all applicable State and Federal drinking water quality standards. However, the water system is also responsible for providing water for other non-potable uses. This variety of uses of the City's water system requires establishing a priority of uses of this resource. It is recommended that priorities of water usage be rated in the following order:

- Fire Fighting (Life Threatening)
- Drinking
- Fire Fighting (Property Threatening)
- Sanitary
- Commercial
- Industrial

This usage priority rating is a general guideline only. Decisions by City officials regarding water allocation during emergencies may vary from this on the basis of prevailing conditions.

Responsibilities

Existing policy establishes the following responsibilities for administrative and technical personnel in the event of an emergency:

Mayor

- Keep public informed.

Public Works Director

- Keep Mayor, Council, and public informed.
- Maintain contact with Water Systems Manager.
- Assess disaster/damage. Determine or authorize emergency response.
- Prepare warning information for users.
- Oversee operations.

Public Works O&M Manager

- Keep Public Works Director informed.
- Maintain contact with field crews.
- Assess available equipment and resources.
- Formulate plan for corrective action.
- Execute response action.
- Document incident and response action.

Field Staff

- Take immediate action to protect life.
- Assess damage and investigate apparent causes.
- Notify Water Department office.
- Keep Water Systems Manager informed.
- Assist in taking corrective action.

Office Staff

- Contact emergency services and agencies, as appropriate.
- Answer incoming phone calls.

- Maintain radio contact with field crews.

Police Chief

- Maintain crowd and traffic control.
- Provide site isolation and security.

Fire Chief

- Provide fire control.
- Provide emergency aid.

Appendix N

KI&A Aberdeen Water Outlook

2020 Updated Water Outlook

Adopted Rates 2020 thru 2024, then by cpi (Ord. 6655)

Residential Base Rate includes 3.99 cu ft per month (used to be 12.99)

Updated with 2019 actual revenue/expense and 2020 budget

Includes updated costs and timing for CIP provided by city

Assumes \$2M timber sale in 2021 to go towards Dredging

Assumes borrowing for Reservoir Covers \$3.2M in 2021

Water Reserves

Water reserves will be used to carry out CIP, together with increased revenue from rates.

Current outlook anticipates low CIP in 2024-25, so capital reserves will increase.

Summary Rate Outlook

2020 Scen: \$2M Timber sales in 2021, Borrow Reservoir Covers \$3.2M 2021

Rate Outlook	2020	2021	2022	2023	2024	2025
Water Utility Fund 404						
Residential Base Rate	\$26.78	\$29.78	\$32.78	\$35.78	\$38.78	\$38.78 includes up to 3.99 cu. ft. per month
Increase/(use) of Reserves	-	-	-	-	10,350	7,750

Financial Plan

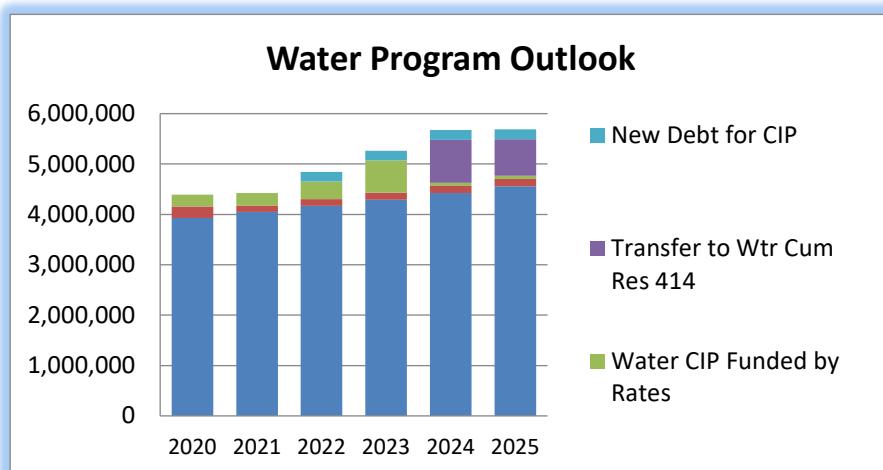
- Fund dredging with Timber sale and reserves
- Borrow for Reservoir Covers
- Model estimates debt payment beginning year after construction as shown
- Other CIP funded by rates & reserves

Water Six-Year 2020

City of Aberdeen
Utility Rate Study
Prepared by KI&A

Adopted Rates 2020 thru 2024, then by cpi (Ord. 6655)
Updated CIP scheduling/cost estimates per City
2020 Scen: \$2M Timber sales in 2021, Borrow Reservoir Covers \$3.2M 2021

Water Utility Fund 404	Base Year						Final Version, 2020
	2020	2021	2022	2023	2024	2025	
Assumptions							
Growth - New Homes per year	0	0	0	0	0	0	0 or Equiv. Residential Units (ERU)
Cost escalation - inflation per year	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Residential Monthly Water Rate	\$26.78	\$29.78	\$32.78	\$35.78	\$38.78	\$38.78	per ord. 6655, 2020-24
Revenue ERUs	11,352	11,352	11,352	11,352	11,352	11,352	11,352 revenue / residential rate / 12
Water Utility Fund 404							
Revenue	est. \$360k new rev.						
Water Sales - retail	3,648,152	4,056,800	4,465,500	4,874,200	5,282,900	5,282,900	adds # new homes x rate x 12 mos
Water Sales - contract	351,236	361,800	372,700	383,900	395,400	407,300	by cost escalation for staff
Timber Sales	0	-	shown as funding for CIP				supporting only CIP, not operations
Miscellaneous Revenue	6,750	6,750	6,750	6,750	6,750	6,750	flat (late, turn off/on, renter, misc)
Transfer In from Wr Cum Res 414	387,250						
Subtotal Water Revenues	4,393,388	4,425,350	4,844,950	5,264,850	5,685,050	5,696,950	
Expenditures							
Water Operating Expenses	3,928,584	4,046,400	4,167,800	4,292,800	4,421,600	4,554,200	by cost escalation
Capital Bldg,Equip,Softwr,Other	230,000	130,000	133,900	137,900	142,000	146,300	by cost escalation
Water CIP Funded by Rates	234,804	248,950	347,950	638,850	65,800	68,400	See CIP below
Transfer to Wtr Cum Res 414					850,000	725,000	
New Debt for CIP	-	-	195,300	195,300	195,300	195,300	
Subtotal Expenditures	4,393,388	4,425,350	4,844,950	5,264,850	5,674,700	5,689,200	
Increase/(use) of Reserves	-	-	-	-	10,350	7,750	



Water Six-Year 2020

Water Utility Fund 404 Financial Outlook	Base Year						Final Version, 2020 Comments
	2020	2021	2022	2023	2024	2025	
Water Utility Fund 404							
Beginning Balance	1,179,008	1,179,008	1,179,008	1,179,008	1,179,008	1,189,358	2019 ending "cash on deposit"
Increase/(Use) of Reserves	-	-	-	-	10,350	7,750	
Ending Balance - Water 404	1,179,008	1,179,008	1,179,008	1,179,008	1,189,358	1,197,108	
Target Minimum Balance							
Cash Flow Reserve	982,146	1,011,600	1,041,950	1,073,200	1,105,400	1,138,550	3 months of operating expense
Meets Target?	ok	ok	ok	ok	ok	ok	compare ending bal. to target
Available for CIP from W 404	196,862	167,408	137,058	105,808	83,958	58,558	+ Cash Flow Reserve
Water Cumulative Reserve 414							
Beginning Balance	2,509,875	1,989,079	1,649,029	1,592,479	1,153,529	2,008,529	2019 ending "cash on deposit"
Investment Interest	5,000	5,000	5,000	5,000	5,000	5,000	flat
Bond Escrow Release (SC) - 2019							Release split wtr/swr reserves
Timber Sales for CIP	-	2,000,000	-	-	-	-	see CIP funding sources
Transfer In from W Fund 404	-	-	-	-	850,000	725,000	
Transfer Out to W Fund 404 for CIP	(525,796)	(2,345,050)	(61,550)	(443,950)	-	-	
Estimated Ending Balance 414	1,989,079	1,649,029	1,592,479	1,153,529	2,008,529	2,738,529	Min. Emergency Reserve = \$300k
Target Minimum Balance							
Emergency Reserve	300,000	300,000	312,000	324,480	337,459	350,958	\$300k + construction cost escalation
Meets Target?	ok	ok	ok	ok	ok	ok	compare ending bal. to target
Available for CIP from W 414	1,689,079	1,349,029	1,280,479	829,049	1,671,070	2,387,571	+ Emergency Reserve \$300k+esca
	0%	0%	0%	0%	0%	0%	

Water Six-Year 2020

Water Utility Fund 404 Financial Outlook	Base Year						Final Version, 2020 Comments
	2020	2021	2022	2023	2024	2025	
SIX-YEAR CAPITAL IMPROVEMENTS							
W-1 Water System Plan	116,000						budget request
W-2 Hypochlorite		744,000					per HDR 30% design est.
W-3 New Floating Covers - Reservoirs		3,161,300					updated estimate 2020
W-4 New Membranes			300,000	840,000			
W-5 Dredging Malinowski dam (Wish	200,000	3,800,000		-			assumes no borrowing
Watershed Forestry Mgmt	387,250	50,000	50,000	50,000	50,000	50,000	added ongoing? Becomes oper exp?
Small Diameter Repl	replace approx. 1000-2000 LF per year within operating budget						
Total Six-Year CIP - W (\$2018)	703,250	7,755,300	350,000	890,000	50,000	50,000	in 2018 Dollars
Six-Year CIP W (Escalated)	760,600	7,755,300	409,500	1,082,800	65,800	68,400	reads above
Average Annual 2019-24	1,690,400	construction escalation @ 4% per year					

CIP FUNDING SOURCES						
W GFC Connection Charges	0	0	0	0	0	0
Borrow: DWSRF		3,161,300	-	-		
Borrow: DWSRF						Floating Covers - Reservoir
Timber Sales		2,000,000				Dredging after Timber sales
Planned Use of W Reserves 414	525,796	2,345,050	61,550	443,950		
Funded by Rates	234,804	248,950	347,950	638,850	65,800	68,400
Total CIP Funding Sources - W	760,600	7,755,300	409,500	1,082,800	65,800	68,400
New Debt for CIP						
DWSRF (20 yr, 2%)		\$195,300	\$195,300	\$195,300	\$195,300	assumes no subsidy
DWSRF (20 yr, 2.5%)			\$0	\$0	\$0	assumes no subsidy
Total New Debt for CIP		195,300	195,300	195,300	195,300	195,300 reads above

Estimated new debt payments - begin year after borrowing

Water 3-YR History

City of Aberdeen Utility Rate Study

Source: City reports

ROW 89 = Raw Data from City Budget Reports

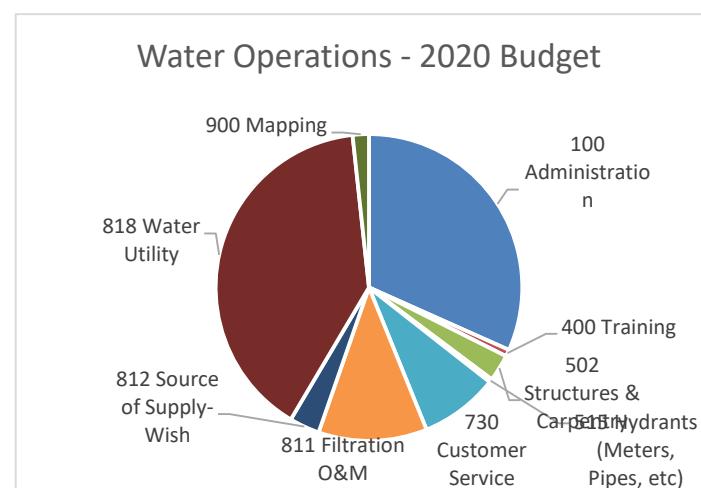
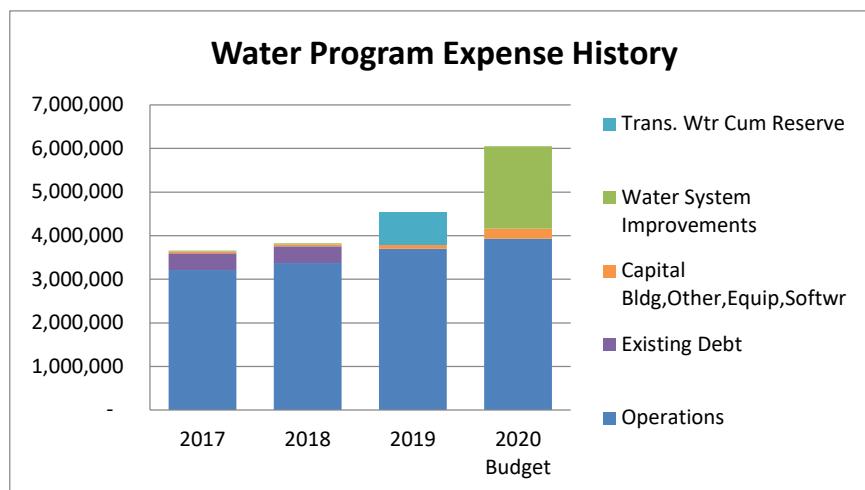
Final Version, 2020

with actual 2019, budget 2020

Financial History	2017	2018	2019	2020 Budget	Comments
Water Utility Fund 404					
Revenue					
Water Sales	3,316,028	3,322,746	3,288,152	3,282,500	removed fund balance-see below
Water Resales-Cosmopolis	173,155	167,960	198,431	165,000	
Opg Revenues-Stafford Ck	172,484	158,681	152,805	162,000	
Other Services And Charges	790	5,154	4,990	1,000	
Interfund Job Orders	-	-	-	-	
Investment Interest	2,370	2,391	10,004	1,500	
Rent & Lease Revenues	1,518	12,352	7,444	4,250	
Donation-Coastal Harvest	74	(68)	(256)	-	
Misc - Junk, Scrap, & Surplus	41,589	22,884	43,116	-	
Timber Sales	-	-	1,668,000	-	
PWTF Loan			1,300,000		
Transfer in From Water Reserves			387,250	Watershed Forestry Mgmt	
Subtotal - Revenue	3,708,009	3,692,100	5,372,686	5,303,500	
Expenses					
100 Administration	845,374	926,922	1,076,611	1,244,379	
400 Training	12,962	17,947	13,557	28,094	
502 Structures & Carpentry	-	17,586	59,582	111,326	
515 Hydrants (Meters, Pipes, etc)	7,238	7,185	307	13,971	
730 Customer Service	451,168	513,741	321,681	325,755	
811 Filtration O&M	388,636	422,306	429,413	450,172	
812 Source of Supply-Wish	133,109	141,552	107,137	125,224	
818 Water Utility	1,334,884	1,272,757	1,516,491	1,562,517	
900 Mapping	36,261	50,694	66,569	67,146	
Prin-filtration Pw-98-791-001	378,246	378,246	-	-	debt paid off 2018
Interest Filt. PW 98-791-001	7,565	3,782	-	-	debt paid off 2018
Buildings	1,030	5,394	11,872	45,000	bldgs,other,equip,softwr
Improvements Other Than Bldgs	20,310	6,281	73,968	100,000	bldgs,other,equip,softwr
Machinery & Equipment	20,531	33,357	-	60,000	bldgs,other,equip,softwr
Computer Software-springbrook	-	-	-	20,000	bldgs,other,equip,softwr
Sensus Software Upgrade			110,687	5,000	bldgs,other,equip,softwr
Dredge Malinowski dam			-	200,000	
Reservoir Covers		-	105	1,100,000	
Water System Plan				116,000	

Water 3-YR History

Financial History	2017	2018	2019	2020 Budget	Comments
Water Utility Fund 404					
Watershed Forestry Mgmt				387,250	
Water Major Improvements	20,107	26,483	-	89,000	
Transfer to 414	-	-	750,000	-	Wtr Cum Reserve
Subtotal Expenditures	3,657,419	3,824,233	4,537,980	6,050,834	
Annual Incr/(Use) of Reserves	50,590	(132,133)	834,706	(747,334)	
<u>SUMMARY W. EXPENDITURES</u>					
Operations	3,209,630	3,370,690	3,702,035	3,928,584	operations
Existing Debt	385,811	382,028	-	-	debt paid off 2018
Capital Bldg,Other,Equip,Softwr	41,872	45,032	85,840	230,000	ongoing
Water System Improvements	20,107	26,483	105	1,892,250	CIP projects
Trans. Wtr Cum Reserve	-	-	750,000	-	for future CIP
Total Water Expenditures	3,657,419	3,824,233	4,537,980	6,050,834	



Water 3-YR History

Financial History	2017	2018	2019	2020 Budget	Comments
Water Utility Fund 404					
WATER UTILITY FUND 404			2019	2020 Budget	
Beginning Cash Balance				1,179,008	2019 ending "cash on deposit"
Annual Incr/(Use) of Reserves	50,590	(132,133)	834,706	(747,334)	
Estimated Ending Cash Balance				431,674	<i>estimated ending bal</i>
WATER CUMULATIVE RESERVE FUND 414					
WATER CUMULATIVE RESERVE FUND 414			2019	2020 Budget	
Beginning Cash Balance			885,099	2,509,875	2019 ending "cash on deposit"
Investment Interest			12,243	-	
Insurance Recoveries			137,650	-	
Transfer In from Water 404			750,000	-	
Transfer Out to Water 404 for CIP			-	(387,250)	watershed forestry mgmt
Estimated Ending Cash Balance			1,784,992	2,122,625	<i>estimated ending bal</i>

City of Aberdeen**Utility Rate Study**

Prepared by KI&A

Final Version, 2020

WATER AFFORDABILITY**Based on DOH DWSRF Guidelines, August 2018**

DWSRF Subsidy Test - MHI	Aberdeen, WA	Factfinder, ACS 2013-17 5-yr
MHI 2013-17 Am Com Surv 5-yr	\$40,702	
Monthly MHI	\$3,391.83	
Test Affordability @ 2.0% of MHI	2.0%	
If Avg. Mo. Water Rate with loan =	\$67.84	up to 30% principal forgiveness
Test Affordability @ 1.5% of MHI	1.5%	
If Avg. Mo. Water Rate with loan =	\$50.88	reduced interest from 2.25% to 1.75%
Standard Interest Rate	2.25%	
Standard Repayment Period	20 years	
Repayment Period with Subsidy	24 years	
Reduced interest rate to 1.75% for completing project within 24 mos. of contract execution		

CURRENT WATER RATES - 2020

Monthly Water Rate Schedule	2020	2020
Single Family Base (incl. 3.99 ccf)	\$26.78	Commercial, 5/8" & 3/4" (incl.10.99)
Single Family Base (incl. 12.99 ccf)		Comm'l Only, Volume Rate 11-12.99
Volume Rate 4-12.99 ccf	\$1.89	\$33.12
Volume Rate 13-30.99 ccf	per ccf	\$3.78
Volume Rate 31-60.99 ccf	per ccf	\$3.78
Volume Rate 61-100.99 ccf	per ccf	\$3.78
Volume Rate 101+ ccf	per ccf	\$2.57
Average SF Residential Usage	8 ccf or 800 cf	averaged over the year
Single Family Residential @ 8 ccf	\$34.34	

ccf = 100 cubic feet

2020 WATER RATE RESTRUCTURE**1. The 2020 Water Rate Restructure - Residential**

To encourage conservation and allow customers to lower their bills by conserving, the base rates were consolidated to 1 base rate that includes up to 3.99 ccf, then pay for additional water used.

2. Move Away From Declining Water Tiers

To encourage conservation and reduce pressure on base rates, the higher volume tiers are being adjusted over the five years so that those that use more will pay more. The City will step into up to level water tiers by 2024, as reflected in Ordinance No. 6655, adopted November 13, 2019.

3. Adjusted Senior/Low Income Rate Discount

For age & income qualified residents, provide a 20% discount on water & sewer monthly base rates year-round.

Adopted Water Rates, Ord. No. 6655, Nov. 2019	2020	2021	2022	2023	2024
Fixed-rate minimum - in hundred cubic feet	Monthly				
Single-Family/Duplex residential - 0 - 3.99	\$26.78	\$29.78	\$32.78	\$35.78	\$38.78
Low-Income Senior (age & income-qualified)	\$21.42	\$23.82	\$26.22	\$28.62	\$31.02
Commercial (for 5/8 & 3/4 inch meters) - 0 - 3.99	\$28.09	\$31.23	\$34.38	\$37.52	\$40.67
Consumption in hundred cubic feet	Additional charge per hundred cubic feet				
4.00 - 12.99	\$1.89	\$1.97	\$2.04	\$2.13	\$2.21
4.00 - 12.99 (commercial only)	\$3.78	\$3.93	\$4.09	\$4.25	\$4.42
13.00 - 30.99	\$3.78	\$3.93	\$4.09	\$4.25	\$4.42
31.00 - 60.99	\$3.78	\$3.93	\$4.09	\$4.25	\$4.42
61.00 - up	\$2.57	\$3.00	\$3.50	\$4.00	\$4.42

Comparison

City of Aberdeen

Utility Rate Study

Prepared by KI&A

2020 Water Rate Restructure - base rate includes up to 3.99 ccf, then pay for additional water used

Comparison of Single Family Rates & System Development Charges

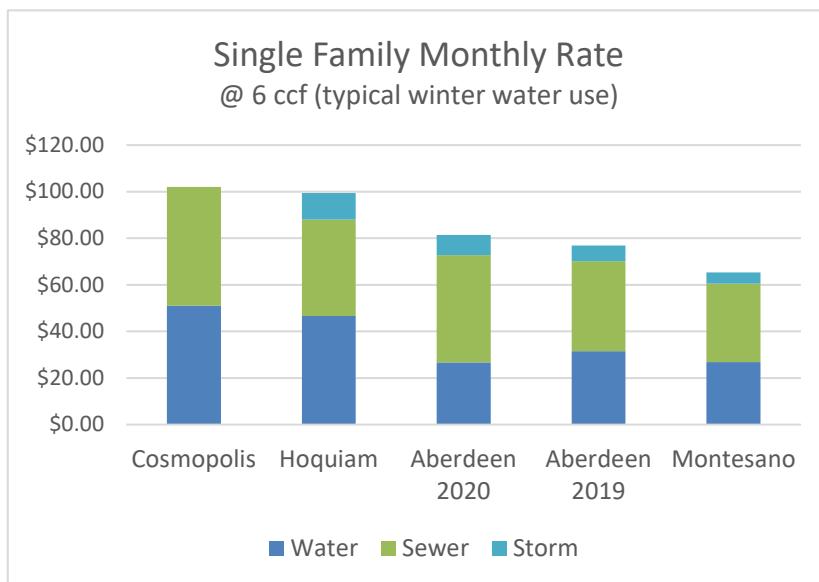
2019 Single Family Monthly Rate @ 6 ccf (typical winter water use)

Jurisdiction	Water	Sewer	Storm	Combined	
Cosmopolis	\$51.07	\$50.99	\$0.00	\$102.06	Cosmopolis
Hoquiam	\$46.71	\$41.37	\$11.33	\$99.41	Hoquiam
Aberdeen 2020	\$26.78	\$46.00	\$8.69	\$81.47	Aberdeen 2020
Aberdeen 2019	\$31.58	\$38.62	\$6.69	\$76.89	Aberdeen 2019
Montesano	\$26.85	\$33.65	\$4.85	\$65.35	Montesano

Aberdeen and Hoquiam have Low-Income Senior Discount rates

Typical Aberdeen single family is 5.36 ccf per Utility Billing, compared at 6 ccf

Utility Tax: Hoquiam @ 12%, Cosmopolis @ 11%, Aberdeen @ 3.43%, added on bill.



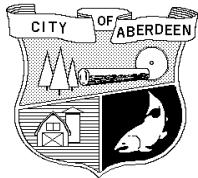
Appendix O

Public Input Process

Appendix P

SEPA Documentation

City of
Aberdeen



Community Development Department
Building/Code Compliance/Planning/Property Maintenance Divisions
200 East Market Street • Aberdeen, WA 98520-5242
PHONE (360) 537-3238 • EMAIL lscott@aberdeenwa.gov
FAX (360) 537-3350 • TDD (360) 533-6668

January 6, 2021

Department of Ecology
SEPA Unit
P.O. Box 47703
Olympia, WA 98504-7703

RE: DNS

Permit Coordinator:

The City of Aberdeen is processing a SEPA Checklist for the update to our Water System Plan.

The City of Aberdeen has issued a DNS as part of our review of this project. Please find enclosed a copy of the DNS, SEPA Checklist, Mapping and the Water System Plan.

All documents that have been submitted by the applicant are also available for review online at <https://ci-aberdeen-wa.smartgovcommunity.com/PublicNotice/PublicNoticeHome>. Click on the accept tab and all documents for this application are available by opening Permit No. 2021-0028.

Please contact me at (360) 537-3238 if you have any questions.

Sincerely,

Lisa Scott
Director

encl.

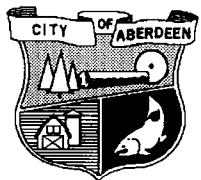
cc: Rick Sangder, Public Works Director
Daryl Epstein, City Engineering Tech.
Quinault Indian Nation
Grays Harbor County
Confederated Tribes of Chehalis Reservation
File



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City of Aberdeen Water System Plan Update
Determination of Non-Significance (DNS)

Description of Proposal: The City of Aberdeen, is updating the Water System Plan that lays out how the City of Aberdeen meets current and future water demands, ensures high-quality drinking water, enhances system reliability and resiliency and cost-effectively investing and maintain the water system. The City of Aberdeen's water system services approximately 6,000 service connections, including wholesale customers outside City Limits: Stafford Creek Correctional Center, City of Cosmopolis and customers to the north along the Wishkah Road. The WSP was developed to meet the requirements of WAC 246-290 and provide comprehensive planning to meet future water supply requirements for the service area served by the City of Aberdeen.

Proponent: City of Aberdeen
Public Works-Engineering
Daryl Epstein
200 East Market Street
Aberdeen, WA 98520

Location of current proposal: The incorporated City limits of Aberdeen and the unincorporated areas of Grays Harbor County, including: Wishkah, Junction City, Stafford Creek Correctional Center and the City of Cosmopolis.

Lead Agency: City of Aberdeen. The City of Aberdeen, acting as lead agency pursuant to WAC Chapter 197-11-926(1) for this proposal, has determined that it does not represent a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030 (2) (c). This decision was made after review of the completed environmental checklist and other information on file with the City of Aberdeen, Community Development Department.

All documents, including the SEPA Checklist are available for review online at <https://ci-aberdeen-wa.smartgovcommunity.com/PublicNotice/PublicNoticeHome>. Click on the accept tab and all documents for this application are available by opening Permit No. 2021-0028. If you do not have access to the internet, please contact the responsible official, listed below and the documents can be mailed to you.

This DNS is issued under the authority of AMC Chapter 14.04.090, WAC Chapter 197-11-340 and RCW Chapter 43.21C.135; the City will not act on this proposal until 14 days from January 7, 2021. Comments must be submitted by January 21, 2021 and addressed to the responsible official at the address or email below:

Responsible Official: Lisa Scott 
Address: Community Development Department
200 East Market Street
Aberdeen, Washington 98520-5242
Phone: (360) 537-3238
Email: lscott@aberdeenwa.gov
Date: January 6, 2021

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

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

Instructions for applicants:

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

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

Instructions for Lead Agencies:

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

Use of checklist for nonproject proposals:

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

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

1. Name of proposed project, if applicable: City of Aberdeen **Water System Plan Update**
2. Name of applicant: **Daryl Epstein**
3. Address and phone number of applicant and contact person:

Daryl Epstein
Engineer
200 E. Market St.
Aberdeen, WA 98520
(360) 537-3239

4. Date checklist prepared: **12/9/2020**
5. Agency requesting checklist: **Washington State Department of Health**
6. Proposed timing or schedule (including phasing, if applicable):

The Water System Plan includes a six-year capital improvement plan for years 2020 through 2025 and an extended capital improvement plan for years 2026 through 2039.

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

Yes. The Water System Plan identifies water delivery system and water treatment facility improvements that are necessary to maintain the integrity of the system and provide adequate treatment and delivery capacity, including installation of new water transmission lines. The SEPA process will be followed for all non-exempt construction projects.

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

None other than what is contained in the Plan.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

None known.

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

- **Approval by City of Aberdeen City Council**
- **Approval by Washington State Department of Health**

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

The Water System Plan Update lays out how the City of Aberdeen meets current and future water demands, ensures high-quality drinking water, enhances system reliability and resiliency, and cost-effectively invests in and maintains the water system. The City

of Aberdeen's water system services approximately 6,000 service connections, including wholesale customers outside City Limits: Stafford Creek Correctional Center, City of Cosmopolis, and customers to the north along Wishkah road. The Plan was developed to meet the requirements of WAC 246-290 and provide comprehensive planning to meet future water supply requirements for the service area served by the City of Aberdeen.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The City of Aberdeen obtains its municipal water supply from the Wishkah River. Surface water is impounded by the Malinowski Dam, diverted to the Water Treatment Plant, then routed to the distribution system which services within the boundaries of the City of Aberdeen, as well as shares two interties with the City of Hoquiam for emergency use, services customers north along the Wishkah River, the City of Cosmopolis, and Stafford Creek Correctional Center.

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

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

a. General description of the site:

The Water System Plan Update does not indicate any one specific site.

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

Areas include varied terrain, including flat, hilly, and steep slopes.

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

Slope varies, depending on the area, but can reach up to 30 percent along the northern City limits.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

Plan includes a large area, which includes all of the listed soil types. However, the Majority of soils within Grays Harbor County are classified as Ocosta, Udorthents and Zenker-Elochoman by the U.S. Department of Agriculture Soil Conservation Service. Ocosta soils are defined as deep, poorly drained, nearly level soils on flood plains and deltas. The udorthents series soil consists of sandy and loamy river dredging on diked tidal flats. The Zenker-Elochoman soils are deep, well-drained, and nearly level to extremely steep soils on sandstone uplands.

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

Soils in the vicinity of specific construction projects will be evaluated using the design of each project. In general, the potential for seismic activity in the Aberdeen area is high. A large, deep earthquake occurred in 1999 approximately 19 miles east of Aberdeen. City mapping shows steep slope and moderate to severe erosion hazard areas located along the north City limits, along the Wishkah River, and along the north of the Chehalis River on the east side of the City. A landslide occurred over the last year on Basich Boulevard in the north of the City.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Requirements for filling and grading will be evaluated during the design of specific construction projects.

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

Best management practices (BMPs) will be exercised during construction practices, which should minimize, if not prevent, erosion.

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

This will be evaluated as new facilities are designed. Installation of new water lines has no direct expected increase in impervious surface area.

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

Proper construction practices using BMPs will minimize runoff from the site and restore disturbed area in order to prevent erosion.

2. Air [\[help\]](#)

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Typical emissions from construction and construction equipment during construction of specific projects.

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

Does not apply.

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

Proper mufflers and air emissions control equipment devices will be maintained on construction equipment. Distributed areas will be wetted to control dust.

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

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

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

The Chehalis River runs between North and South Aberdeen through to the west. The Wishkah River empties into the Chehalis River along East Aberdeen from the north. The Wishkah River is also the source of the City's water supply. Lake Aberdeen to the east of Aberdeen feeds into the Chehalis River.

- 2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

There are multiple potential projects that include improvements and maintenance near to the described waters. The Malinowski Reservoir Siltation Mitigation project will restore volume within the reservoir behind Malinowski Dam. Water distribution system piping projects may occur near the described waters. Detailed construction description and plans have not yet been developed for these projects.

- 3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

None.

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

None forseen.

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

There are various areas throughout Aberdeen that are located in a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No.

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

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

No. The City obtains its drinking water from the Wishkah River.

- 2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste material will be discharged.

c. Water runoff (including stormwater):

- 1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Stormwater will be diverted around construction sites. Stormwater drainage will be considered during the design of new facilities.

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

Proper construction practices will prevent waste materials from entering ground or surface waters.

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

There is no foreseeable reason to expect future projects called out in The Water System Plan to alter drainage patterns within their respective sites.

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

Anticipated project measures include diversions of stormwater around construction sites, proper dewatering practices, and consideration of stormwater drainage during design of new facilities.

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

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

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

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

There may be vegetation, limited to grass and shrubs, that lies where new water lines/valves to be installed. The amount and kind has yet to be determined. Watershed forestry management may include timber sales.

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

The Western Washington Fish and Wildlife Office, as apart of The U.S. Fish and Wildlife Service, have listed the following species as Endangered an Threatened:

- Brown pelican
- Bull trout
- Marbled murrelet
- Northern spotted owl
- Oregon silverspot butterfly
- Short-tailed albatross
- Western snowy plover

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

This will be considered during implementation of specific projects.

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

There are numerous noxious weeds and invasive species within Grays Harbor County. These will be observed and recorded during implementation of specific projects.

5. *Animals* [\[help\]](#)

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

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

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

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

No detailed survey of the area was taken. However, several of the animals and bird listed may exist in the area.

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

The Western Washington Fish and Wildlife Office, as apart of The U.S. Fish and Wildlife Service, have listed the following species as Endangered an Threatened:

- Brown pelican
- Bull trout
- Marbled murrelet
- Northern spotted owl
- Oregon silverspot butterfly
- Short-tailed albatross
- Western snowy plover

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

The City of Aberdeen is located within the Pacific Flyway for waterfowl and many species are known to be present in Grays Harbor and upstream on the Chehalis River, especially during the spring and fall migrations. Pacific salmon spawn in the Chehalis River upstream, and green sturgeon migrate into the lower Chehalis River to feed while migrating between Central California and SE Alaska.

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

Exact locations of future projects and wildlife mitigation measures will be addressed during specific project design. In general, standard construction BMPs will be implemented to avoid and minimize the potential for erosion from work areas and resulting impacts on fish and other aquatic species.

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

None known.

6. Energy and Natural Resources [\[help\]](#)

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

The Water Treatment Plant will undergo a disinfection system alteration. The controls and PLC will run on electricity. The Wishkah Headworks will see an improvement in security and communications systems, which will require electricity to run.

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

No. No new structures would affect potential solar capture by adjacent properties.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

In general, new and upgraded facilities will comply with City of Aberdeen building requirements related to energy conservation. New pumps will be appropriately designed and sized to maximize efficiency and minimize electrical requirements.

7. Environmental Health [\[help\]](#)

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

There is potential risk for exposure to chlorine chemicals (chlorine gas sodium hypochlorite solution) during the construction process of the Water Treatment Plant disinfection conversion. Also, operators at the treatment plant have the potential to come into contact with disinfection solution as a part of their daily jobs. The

operators are trained and experienced as to safety measures to minimize potential for contact.

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

None known.

- 2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

The construction process for the WTP Hypochlorination conversion project involves handling of hazardous chlorine gas and chlorine solution.

- 3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

The existing chlorine disinfection system and chemicals for the new chlorine disinfection system will be stored/used during the transition process of the WTP disinfection conversion project.

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

Fire and ambulance may be required in rare circumstances. Safety showers and eyewashes are provided on-site.

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

In general, chemical storage tanks, chemical conveyance piping and pumping systems are provided with secondary containment and monitoring systems. Safety showers and eyewashes are provided on-site. Construction vehicles and equipment will be fitted with hazardous materials spill kits and operators will be trained in their use.

b. Noise

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

There is train traffic throughout Aberdeen. This is unlikely to affect operations.

- 2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)?

In general, construction equipment will cause temporary noise pollution during construction. There are no foreseen long-term noise problems foreseen after the execution of these projects.

Indicate what hours noise would come from the site.

Construction hours may vary, but typically go from 7am to 5pm.

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

In general, noise mitigation equipment on construction equipment will be properly operated and maintained. Work should be planned to be limited to daylight hours.

8. Land and Shoreline Use [\[help\]](#)

- a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The Plan affects many areas with various uses, ranging from undeveloped to residential, commercial, and industrial.

- b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

No. Project sites are dedicated to the Aberdeen Water Department. The improvements identified in the Plan will not convert any farm lands or working forest lands to non-forest or non-agricultural uses.

- 1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

No.

- c. Describe any structures on the site.

Potential project sites include structures such as dams, tanks, buildings, and houses.

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

Old pipes will be replaced with new pipes. Old reservoir covers will be replaced with new covers. The chlorination system conversion for the WTP will include a demolition of various structures, including chlorine gas tanks and lines.

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

Varies throughout the area, including residential, commercial, industrial, and public.

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

Varied, similar to the above-mentioned zoning classifications.

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

Not applicable.

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

Depends on final selection of sites for new facilities.

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

The service population is currently about 18,000, including the City of Cosmopolis.

j. Approximately how many people would the completed project displace? **N/A**

None.

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

None required.

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

The Plan should be reviewed by The City of Aberdeen Community Development Department to ensure consistency with applicable comprehensive plans, land use plans, and planning assumptions, including growth rates.

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

None, as no impacts are anticipated.

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

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

None planned.

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

None planned.

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

None, as no impacts are anticipated.

10. Aesthetics [\[help\]](#)

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

In general, the height of new structures for potential projects are anticipated to be similar to existing structures on the sites. Building structures are typically reinforced concrete or reinforced concrete masonry.

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

In general, impact views are expected to be minimal to none.

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

SEPA checklists will be prepared for specific non-exempt construction projects that describe measures to reduce or control aesthetic impacts.

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

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

Unknown at this time.

b. Could light or glare from the finished project be a safety hazard or interfere with views? **N/A**

Unknown at this time. Light or glare that is a safety hazard or interferes with views is not anticipated.

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

Does not apply.

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

Impacts from light and glare will be considered during design of future facilities.

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

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

There may be adjacent recreational opportunities in areas where water lines are being placed.

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

None planned.

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

Sites where new water lines will be placed will have a plan to maintain layout identical to pre-construction.

13. Historic and cultural preservation [\[help\]](#)

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.

Not researched. This will be evaluated during implementation of specific projects.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

This will be evaluated during implementation of specific projects.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Mitigation of impacts on historic and cultural sites will be considered during design of future facilities.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

If it is determined that historic sites are located on or in close proximity to the project are identified, a cultural resources survey will be conducted. The construction specifications will include an Inadvertent Discovery Plan that will be implemented in the event cultural resources are uncovered.

14. Transportation [\[help\]](#)

- a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

The Plan covers a wide array of streets and highways within the service area of the City of Aberdeen.

- b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

The Plan covers a wide array of streets and highways within the service area of the City of Aberdeen. Transit stop distances will vary depending on implementation of potential projects.

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

Does not apply.

- d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

Watershed Forestry Management will include road maintenance.

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

No.

- f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

A significant increase in vehicular trips is not anticipated. Visits to reservoir sites for inspection and maintenance will be necessary. Vehiculr traffic will increase temporarily during construction when construction workers drive to and from the construction sites.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

It is not anticipated that the projects will interfere with the movement of agricultural forest products.

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

None are anticipated.

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

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

Water services will be provided as dictated by need. Water service by itself will not cause the need for public services to increase.

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

Growth within the service area will be determined by zoning, land use, and needs or restrictions. Water services will be provided based on need. Projects in the Plan will improve water service and fire protection in the service area.

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

a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Potable water conveyance and treatment are involved in the Plan. SEPA checklists will be prepared for specific non-exempt construction projects which will discuss the utilities that will be required for the proposed sites.

C. Signature [\[HELP\]](#)

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.



Signature:

Name of signee Daryl Epstein

Position and Agency/Organization Engineer

Date Submitted: 1/5/21

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

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

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

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

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

Water service alone does not cause any of the mentioned situations. Some minor temporary impacts may occur during construction.

Proposed measures to avoid or reduce such increases are:

Proper construction practices will avoid or reduce temporary impacts.

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

The projects proposed in this Plan are not anticipated to affect plants, animals, fish, or marine life. Measures for protection or conservation will be considered during project design.

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

Design decisions and construction procedures will follow all proper procedures and practices to minimize impacts on plants, animals, fish, and marine life.

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

Energy will be used to construct new facilities and operate equipment after facilities are constructed. There will be an increase in surface water withdrawal corresponding to growth projections outline in the Plan.

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

Appropriate reviews, approvals, and permits will be obtained before planned construction projects so as to protect and conserve energy and natural resources. The Plan includes a water conservation plan identifying activities to be implemented by the City. Energy-efficient equipment will be considered wherever possible.

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

No such effects are anticipated.

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

All regulations concerning sensitive or protected areas will be followed during implementation of projects described in the Plan.

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

No such effects are anticipated.

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

All regulations concerning sensitive or protected areas will be followed during implementation of projects described in the Plan.

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

The utility rate increase described in the Water System Plan update would foreseeably result in less water demand. Increase in demands on public services and utilities resulting from growth will be determined by zoning, land use plans, and restriction or needs. Water service in itself will not increase the demand for public service.

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

Source development, storage construction, and transmission and distribution system improvements.

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

The Plan is consistent with good management practices for water resources and does not conflict with current laws and regulations. The Plan conforms with all laws and requirements for the protection of the environment.



City of Aberdeen Water System Plan Update
Determination of Non-Significance (DNS)

Description of Proposal: The City of Aberdeen, is updating the Water System Plan that lays out how the City of Aberdeen meets current and future water demands, ensures high-quality drinking water, enhances system reliability and resiliency and cost-effectively investing and maintain the water system. The City of Aberdeen's water system services approximately 6,000 service connections, including wholesale customers outside City Limits: Stafford Creek Correctional Center, City of Cosmopolis and customers to the north along the Wishkah Road. The WSP was developed to meet the requirements of WAC 246-290 and provide comprehensive planning to meet future water supply requirements for the service area served by the City of Aberdeen.

Proponent: City of Aberdeen
Public Works-Engineering
Daryl Epstein
200 East Market Street
Aberdeen, WA 98520

Location of current proposal: The incorporated City limits of Aberdeen and the unincorporated areas of Grays Harbor County, including: Wishkah, Junction City, Stafford Creek Correctional Center and the City of Cosmopolis.

Lead Agency: City of Aberdeen. The City of Aberdeen, acting as lead agency pursuant to WAC Chapter 197-11-926(1) for this proposal, has determined that it does not represent a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030 (2) (c). This decision was made after review of the completed environmental checklist and other information on file with the City of Aberdeen, Community Development Department.

All documents, including the SEPA Checklist are available for review online at <https://ci-aberdeen-wa.smartgovcommunity.com/PublicNotice/PublicNoticeHome>. Click on the accept tab and all documents for this application are available by opening Permit No. 2021-0028. If you do not have access to the internet, please contact the responsible official, listed below and the documents can be mailed to you.

This DNS is issued under the authority of AMC Chapter 14.04.090, WAC Chapter 197-11-340 and RCW Chapter 43.21C.135; the City will not act on this proposal until 14 days from January 7, 2021. Comments must be submitted by January 21, 2021 and addressed to the responsible official at the address or email below:

Responsible Official: Lisa Scott 
Address: Community Development Department
200 East Market Street
Aberdeen, Washington 98520-5242
Phone: (360) 537-3238
Email: lscott@aberdeenwa.gov
Date: January 6, 2021

Classified Proof

Client	ADW75736 - City of Aberdeen	Phone	(360) 533-4100		
Address	200 E. MARKET	E-Mail	kbradt@thedailyworld.com		
	ABERDEEN, WA, 98520	Fax			
Order#	917285	Requested By	LISA SCOTT	Order Price	\$309.06
Classification	9963 - Legals	PO #	DNS WATER SYSTEM	Tax 1	\$0.00
Start Date	01/12/2021	Created By	4404	Tax 2	\$0.00
End Date	01/12/2021	Creation Date	01/07/2021, 09:35:01 am	Total Net	\$309.06
Run Dates	1			Payment	\$0.00
Publication(s)	Daily World				
Sales Rep	4404 - Bradt, Kathy	Phone	(360) 537-3907		
		E-Mail	kbradt@thedailyworld.com		
		Fax			

Classified Proof

City of Aberdeen Water System Plan Update Determination of Non-Significance (DNS)

Description of Proposal: The City of Aberdeen, is updating the Water System Plan that lays out how the City of Aberdeen meets current and future water demands, ensures high-quality drinking water, enhances system reliability and resiliency and cost-effectively investing and maintain the water system. The City of Aberdeen's water system services approximately 6,000 service connections, including wholesale customers outside City Limits: Stafford Creek Correctional Center, City of Cosmopolis and customers to the north along the Wishkah Road. The WSP was developed to meet the requirements of WAC 246-290 and provide comprehensive planning to meet future water supply requirements for the service area served by the City of Aberdeen.

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Responsible Official: Lisa Scott
Address: Community Development Department
200 East Market Street
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Phone: (360) 537-3238
Email: lscott@aberdeenwa.gov
Date: January 6, 2021
Publish January 12, 2021. The Daily World 917285