

Bull Run Watershed Program

Section One: Program Description and Goals

The Bull Run Watershed Program encompasses the efforts of the Water Bureau to protect and maintain the natural resources and infrastructure that enable Portland to use the federally designated Bull Run Watershed Management Unit (BRWMU) as the region’s primary drinking water source. The BRWMU is 147 square miles of densely forested lands within the Mt. Hood National Forest that are closed to public entry and contain the water supply infrastructure necessary to provide water to nearly one million Oregonians. Major facilities include two dams and reservoirs, Bull Run Lake, 164 miles of paved and gravel roads, water monitoring systems, and communication systems.

Performance Measure

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Percent of City’s annual water supply provided by BR under normal operating conditions	92	98	>95
Percent of dam and reservoir facilities in good or better condition			
Percent of Bull Run roads in good or better condition			
Percent of Bull Run culverts capable of draining 100-year floods and compliant with aquatic species passage requirements			

Section Two: Explanation of Services

Program efforts are focused on the capital infrastructure planning, design and construction, operations, maintenance, repair, and rehabilitation of the water supply facilities and road system in the BRWMU as well as collaboration with the U.S. Forest Service to protect the natural conditions that support drinking water supply and quality.

Activities include:

Operations, maintenance, and repair of facilities and roads: Watershed program staff have many responsibilities: to maintain and operate the dams; maintain and replace roads, gates, and bridges; and control invasive aquatic and plant species.

Wildfire detection and suppression: Watershed program staff work with partner agencies to minimize the risk wildfire poses to water resources and infrastructure.

Collaboration with the U.S. Forest Service: 95% of the land within the Bull Run Watershed Management Unit is National Forest. The City of Portland and the Forest Service work together to manage the watershed.

Monitoring of water supply and weather conditions: Weather conditions affect water quality and supply. The Water Bureau closely monitors relevant conditions.

Compliance with requirements: The Water Bureau complies with federal land management, historic properties, and cultural resources requirements.

Providing appropriate public access: The Water Bureau leads supervised tours of the watershed for members of the public and other stakeholders.

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Bureau Support Program

Section One: Program Description and Goals

The Bureau Support Program encompasses works across all sections of the Water Bureau to make sure work is effective and considers community perspectives. The program meets administrative, financial, communications, and equity needs.

The program includes promoting equity across all bureau programs and services; engaging the public in bureau work; making sure ratepayer money is being used wisely and appropriately; and making sure the bureau works as efficiently as possible and is accountable to the public.

Performance Measures

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
[To come]			

Section Two: Explanation of Services

Support for bureau-wide work: This program includes contract administration and facilities work, as well as administrative expenses such as rent, utilities, postage, operating supplies, Utility License Fee.

Budget and accounting: Staff in this program manage the bureau's finances, including developing and monitoring the bureau's budget, managing its accounting, and ensuring that funds are spent as designated.

Communications: Bureau communications staff coordinate outreach and engagement work, including social media, communication about construction projects, media and public records requests, and emergency communications.

Equity: Like other city bureaus, the Water Bureau is implementing a five-year Racial Equity Plan. The plan focuses on improving outcomes for communities of color and removing internal and external barriers to equitable work.

Program planning and performance management: This program includes the time managers and supervisors spend planning programs and evaluating performance.

Interagency work: This program includes support from other City of Portland agencies: such as the Bureau of Technology Services, the City Attorney, and the Office of Management and Finance.

Advisory groups: The Water Bureau works with two main utility advisory groups: the Portland Utility Board and the Citizens' Utility Board. Staff in this program work with these advisory groups.

Managing and maintaining bureau-owned property: The bureau owns 175 properties, including around its reservoirs, tanks, pump stations, and other facilities. Activities also include the Mount Tabor Preservation Project and restoring the City's historic reservoirs on the site. (The work on this project is led by the Water Bureau but funded by the General Fund.)

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Conduit/Transmission Program

Section One: Program Description and Goals

The Conduit/Transmission Program is responsible for bringing water from the city's two water sources, the Bull Run Watershed and Columbia South Shore Well Field (CSSWF), to Powell Butte, then to city's in-town reservoirs and tanks (Kelly Butte, Washington Park, Sam Jackson, and Mayfair Tanks).

Major assets in the program include three conduits totaling 60.5 miles and 50 miles of transmission pipe, as well as supporting trestles and bridges, cathodic protection, Willamette River crossings, and intertie facilities. The conduits 2, 3, and 4 were built in 1911, 1925, and 1953, respectively.

Performance Measures

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Number of simultaneous conduit and/or transmission main outages that cause disruption of services.	0	0	0

Section Two: Explanation of Services

Program efforts are focused on the capital infrastructure planning, design and construction, operations, maintenance, repair, and rehabilitation of the assets in this program, as well as hardening the supply to meet seismic resilience goals and improving operability and reducing risk.

This program also makes sure the conduits and transmission mains are regularly inspected, work well, and are protected from corrosive soil. This program also protects the bureau's rights of way where the conduits cross non-bureau property and has laid out a protected path for a future conduit when that will be needed.

Customer Services Program

Section One: Program Description and Goals

This program is responsible for the water meter to water sales cash operations of the Water Bureau and Bureau of Environmental Services (BES). This includes meter reading, managing account and customer data, billing, collection, and payment processing on approximately 192,000 water, sewer, and stormwater accounts that are billed monthly, bi-monthly, or quarterly. This program includes providing financial assistance to qualifying low-income customers.

This program also supports development by performing reviews of water-related building permit application intakes, reviews, and purchases. All developments are reviewed and checked to ensure that they comply with standards for water service.

Performance Measures

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Percentage of calls answered within 60 seconds	51%	82%	80%
Percentage of customer payment transactions made through preferred methods	57%	63%	50%
Average minutes that customers are on hold before speaking to a customer service representative	2.26	0.50	2.00
Respond to new residential plan within 15 days of receipt of permit application			85%
Respond to new commercial plan review within 20 days of receipt of permit application			75%

Section Two: Explanation of Services

Over 750 customer calls are answered daily as well as fielding 75 online inquiries per day regarding customer accounts and other bureau work. The program also assists 75 walk-in customers each day with their payments and/or water service, and administers the Financial Assistance and Low Income Discount work for 6,750 enrolled participants. This program includes the team that manages the Customer Information System, which is the system used by employees in the program to bill for sewer, stormwater, and water services, collect from customers, and assist them with their account inquiries.

This program processes about 2,280 water permits annually related to commercial and residential developments. The activities cover land use reviews, development reviews, sale of new domestic services, fire services, and petition mains needed to support new construction by private parties seeking water service.

Data Management Program

Section One: Program Description and Goals

The Data Management Program is responsible for managing data and information about water system infrastructure. This includes 748 quarter section maps of water facilities, water system facilities plans, projects plans and reports, water use data, conditions of facilities, infrastructure, and equipment, and customer interactions.

The Water Bureau utilizes multiple data management systems, including Records Management, Geographic Information System (GIS) Mapping, Computer Aided Design and Drafting (CADD), and Computerized Maintenance Management System (CMMS).

Data/Information from these systems is used to evaluate and monitor the condition and performance of assets, help make decisions regarding investment strategies, and improve business processes and customer services.

Performance Measures (DRAFT)

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
[To come]			

Section Two: Explanation of Services

Activities include developing, operating, and maintaining data management systems that directly support effective and efficient daily field operations and management of the water system.

This program includes maintaining and updating quarter section maps in GIS mapping; maintaining and reporting from the bureau's maintenance management system and project management system; and maintaining a database for capital improvement projects to monitor planning, design and construction for current status, scope, schedule and budget. The program also includes the maintenance of a construction management system for construction contract administration.

Distribution Mains Program

Section One: Program Description and Goals

There are over 2,260 miles of distribution and distribution-transport main (pipe) that transport drinking water to customers from terminal reservoirs through mains to local storage, and then through mains to hydrants and services to customers.

The system includes active mains that were installed as early as 1894. Pipe sizes in the distribution system range from 1.5" diameter to as large as 36". Distribution system mains include a variety of material types such as cast iron, steel, and ductile iron.

This program ensures the continuity of drinking water for customers, minimizes potential damage to public and private property, ensures fire suppression capabilities, minimizes water loss, and ensures the highest water quality and compliance with regulations.

Performance Measures

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Replace at least 30,000 feet of main each year	27,508	30,264	30,265
Increase installation of new main annually toward FY 23-24 program goal of 40,000 feet	No	Yes	Yes
Provide 2-hour response to all critical main breaks 365 days per year	100%	100%	100%
Repair or mitigate 99% of critical main breaks within 24 hours of notification	100%	100%	99%
Complete unidirectional flushing on XX miles of the system	N/a	N/A	???
Survey 200 miles of main each year for leaks	XXX	XXX	XXX

Section Two: Explanation of Services

This program includes capital infrastructure planning, design, installation, operations, maintenance, and repair of distribution system mains and appurtenances including leak locates and mains flushing. Design and replacement of aging cast iron and steel distribution mains constructed by both city crews and private contractors are the core investments of the program, while main repair, leak locating, and flushing support the maintenance of the existing system. In addition, design and installation/relocation of water main to support interagency projects and development are significant efforts provided in this program.

The bureau installs approximately 30,000 feet of main each year, and experiences an average of 200 main breaks each year. The 30,000 feet of main installation includes a significant allocation of resources to support interagency and development work.

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Employee Investment Program

Section One: Program Description and Goals

The State of Oregon requires employees engaged in the operation of the water system (nearly 200 employees in Water) for both distribution and treatment to be certified by the Oregon Health Authority to engage in that work. Certified employees are required to complete regular continuing education to maintain those certifications. Water Bureau Engineers also must be licensed and complete ongoing education to maintain their certifications, as must electricians. Specialty equipment, such as cranes, require state and national certifications.

The Portland Water Bureau also operates two unique apprenticeship programs for Water Operations Mechanics and Utility Workers that are sanctioned by BOLI and require ongoing training for apprentices. Many field employees are required to obtain a Commercial Driver's License and maintain it, following Federal Department of Transportation requirements.

The City requires a variety of mandatory trainings such as defensive driving, Equity 101, and HR Administrative Rule 2.02 training, and OSHA requires safety-sensitive trainings for Work Zone Traffic Control, Confined Space Entry, Rigging and Slings, Excavation Safety, Hazardous Chemical Training, and Asbestos Handling Training, among many others that are provided by the Water Bureau.

Finally, the Water Bureau augments required trainings with trainings that support the development of employees.

Performance Measures

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Percent of field personnel receiving a minimum of 20 classroom hours of safety training.	100%	100%	100%
Percentage of employees completing audiometric testing for work environments with sound in excess of 85 decibels.	XX%	XX%	XX%

Section Two: Explanation of Services

Program activities include providing employee training; tracking, monitoring, and ensuring all required certifications and license are maintained; and making sure all City-required training are met, including HR 2.2, equity training, and safety trainings. The program also includes administering and evaluating the ongoing apprenticeship programs.

Activities also include managing workplace safety program for high-hazard environments, such as electrical arc-flash, confined spaces, and fall hazards. Ensure our infrastructure and training programs meet all applicable Occupational Safety and Health Administration (OSHA) requirements.

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Field Support Program

Section One: Program Description and Goals

Field Support is a broad group of support functions that enable field crews to complete system maintenance. This program includes the bureau staff who manage work flow, scheduling, and data through the bureau's computerized maintenance management system (CMMS). In addition, this program includes the bureau's inventory of materials and the staff who manage the acquisition, storage, delivery, and contract management in support of field crews. Other functions in this program include the management of bureau's 450+ vehicle fleet management, utility locators, maintenance engineering, surveying, and geotechnical support.

Performance Measure

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Maintenance & Construction field crews complete at least 4,000 work orders each year.	4,095	4,280	4,000

Section Two: Explanation of Services

Program activities include supporting field crews by providing the tools, equipment, materials, and information necessary to complete system maintenance tasks.

Fountains Program

Section One: Program Description and Goals

The Water Bureau owns 129 drinking fountains, primarily the four-bowl fountains known as Benson Bubblers, throughout the city. This program includes operation, maintenance, cleaning, repair, and replacement of those drinking fountains.

The first Benson Bubblers date from 1912. This program maintains these iconic features and provides public drinking water to Portlanders.

This program also includes work by the Parks Bureau to operate and maintain the decorative fountains.

Performance Measures

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
All drinking fountains cleaned every two weeks.	100%	100%	100%
Provide routine maintenance on all 129 fountains to ensure they are operable and cleaned for the public's use.			
Ensure that fountains are inspected regularly and that inoperable fountains are repaired or replaced in a timely manner.			

Section Two: Explanation of Services

Cleaning: Water Bureau crews clean the fountains every two weeks.

Maintenance: Staff in this program maintain, inspect, repair, and replace the fountains as necessary.

Engineering Support: Staff in engineering provide support to maintain standards and develop replacement projects when needed.

Grounds Program

Section One: Program Description and Goals

The Water Bureau property portfolio includes over 175 properties. Those facilities include HydroParks, pump stations, tank sites, reservoir sites, conduit properties, and other bureau-owned properties.

This program maintains the grounds and landscaping around those assets. The activities of this program make it possible for bureau staff to safely access Water Bureau facilities and for community members to use bureau properties.

Performance Measure

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Percent of Bureau ground maintenance plan met.	100%	100%	100%

Section Two: Explanation of Services

Property maintenance: The bureau maintains grounds and landscaping in and around water facilities and its properties to meet Water Bureau and community expectations. This includes cleaning the campsites of people experiencing homelessness.

Specific recreation sites: Staff in this program manage visitor and grounds facilities at Powell Butte, where the Water Bureau has two large reservoirs. They also manage camping and restroom facilities at Dodge Park (reimbursed by the General Fund), which the Water Bureau owns because of its location to a conduit route.

Groundwater Program

Section One: Program Description and Goals

The Groundwater Program contains the Water Bureau's work efforts to protect and maintain the infrastructure and natural resources that enable Portland to reliably draw water from the Columbia South Shore Well Field (CSSWF) as a supplemental and emergency backup supply source. The City has supplied drinking water from the CSSWF since 1984. The well field is used as a supplemental supply during dry periods and as an emergency backup supply when the Bull Run supply is temporarily unavailable (due to major storms, wildfire, or landslides, for example).

The CSSWF draws from three regional aquifers located along the south shore of the Columbia River in Northeast Portland, Fairview, and Gresham. Facilities include 25 production wells, groundwater collection and transmission pipes, 106 non-supply wells including exploratory, pilot, test and monitoring wells, a two million-gallon storage tank, a 100 million-gallon per day (MGD) pumping facility, and associated monitoring systems. The program also includes Water Bureau-owned wells in the Powell Butte area and in the Bull Run Watershed.

Performance Measures

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Be able to provide backup supply of 80 mgd for 60 days and 90 mgd for 14 days (PSL)	100%	85%	100%

Section Two: Explanation of Services

Program efforts are focused on the capital infrastructure planning, design and construction, operation, maintenance, repair, and rehabilitation of the water supply facilities within the CSSWF including the system's production wells, monitoring wells, pumps and motors, well sites, collection mains, and the groundwater pump station

Activities include:

- maintain wells, pipes, pump station in operable condition;
- maintain a monitoring well network in operable condition;
- avoid or minimize groundwater contamination due to human activities;
- monitor aquifer resources and water quality conditions;
- identify and manage naturally occurring groundwater contaminants;
- perform spatial analysis of groundwater conditions and risks;
- collaboration with area businesses to protect water quality and prevent contamination of groundwater resources;
- administration of city code that regulates and requires inspections of chemical storage and drainage systems on public and private property;

- provide technical assistance for regulated businesses and educational events for water customers.

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Hydrants Program

Section One: Program Description and Goals

There are 14,375 hydrants, some installed in the early 1900s, that provide fire suppression, flushing points for water quality and system maintenance, and alternative customer water sources.

The Hydrant Program ensures the constant availability of fire suppression supply throughout the City, providing essential support for life safety and minimizing damage caused by fire to property. The provision of fire hydrants within 250 to 500 feet (depending on zoning) of most structures throughout the city and redundant fire hydrant availability near key facilities such as hospitals and schools ensures constant support of the Fire Bureau's fire suppression efforts.

Hydrants enable crews and customers to access alternative sources of water, which may mitigate service outages, or provide needed water supplies for functions like street sweeping, landscaping, and construction projects.

In addition, hydrants provide key points for flushing the system following the completion of maintenance tasks, and for maintaining water quality in areas of the system prone to water quality issues.

Performance Measures

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Replace at least 225 hydrants each year	234	230	225
Repair at least 150 hydrants each year	167	169	150
99.5% of all hydrants in service	Met	Met	Met
Inspect at least 1,750 hydrants each year	1,897	1,579	1,750

Section Two: Explanation of Services

The activities of this program include, installation, inspection, maintenance, and repair of hydrants and maintaining the inventory of the hydrants in CADD and records management.

Meters Program

Section One: Program Description and Goals

Portland's water system includes about 178,000 small meters and 9,000 large meters throughout the distribution system. Meters allow for accurate measurement of domestic and fireline water use, which allows for accurate measurement and billing.

Water meters enable customers to track their water use and enable the Water Bureau to bill for water usage and the Bureau of Environmental Services to bill for sewer service.

The meters are essentially the cash register for the bureau, and the Meters program is tied to the Customer Services program. Inventory of all meter sizes is maintained by the meters program.

Performance Measures

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Replace 5,400 meters 1" and less in size per year	4,608	5,036	5,400
Test and clean meters 3" and larger	577	566	560

Section Two: Explanation of Services

This program includes capital infrastructure planning, design, and installation, operations, maintenance, testing, and repair of both small and large meters.

Small meters are more often replaced when not measuring accurately or when highly used, as it is more cost effective than attempting to repair them. The goal of the program is to accurately meter water usage in our system, and subsequently bill for that usage. The bureau has a Small Meters Replacement Program. Meter replacement is prioritized based on usage.

A state-certified test bench, which is calibrated twice per year, is utilized to ensure accuracy of our meters. The test bench has been used by other water providers, private entities, and other bureaus when needed. All meters sized 1 ½ inches and larger are tested before being installed in the ground.

Routine testing of large meters occurs given the high consequence of failure. Meters used for recording usage on wholesale customer accounts are tested twice per year, and other high water users are tested once per year. Additional testing on large meters is conducted based on the amount of water usage through the meter.

The program installed and currently maintains about 2,000 automated metering devices, which allows our meter readers to collect reads more efficiently and avoid dangerous reading scenarios.

Planning Program

Section One: Program Description and Goals

The Planning Program includes long-range and short-term utility strategic planning and direction; regional water providers coordination on water supply planning, financial planning; CIP development; infrastructure planning including asset management; summer supply planning; and wholesale customer coordination.

Performance Measures

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Maintain water revenue bond AAA credit rating	100%	100%	100%
Debt service coverage at 1.90 on first lien bonds	3.02	3.22	1.90
Debt service coverage at 1.75 on both first and second lien bonds	1.91	1.99	1.75
Percentage of budgeted Capital Improvement Plan expended	87%	93%	100%
Percentage of projects forecast to be completed within three months of planned date	66%	78%	80%
Track risk service level performance - assessments or mitigation of extreme and high-risk assets	42%	Need	80%
Maintain minimum cash balances	Met	Met	Met
High or Very High rating for quality of water service 75%			
Meet at least 80% of standards established for inspection, testing, repair, and replacement of assets that are identified as high or extreme risk			
CIP projects on schedule			
Achieve continuous improvement in the progression of maintenance "best practice"			
Mitigate 80% of extreme and high-risk assets within 5 years			

Section Two: Explanation of Services

Asset management: Systematically assess water system asset conditions, risks of failure, and risk mitigation strategies. Document alternatives and recommended solutions for maintenance and replacement of supply and distribution infrastructure.

Capital Improvement Project (CIP) planning: Maintain a cost-effective and highly functioning water system by developing and administering a multi-year capital improvement program to address system needs, manage spending, and meet financial bond requirements.

Financial planning: Adhere to prudent financial practices, enabling ongoing cost-effective access to bond financing for capital improvements. Ensure equitable water rates to finance system operation and improvement.

Climate change planning: Build resilience to climate-related risks through risk assessment, analysis, and adaptation strategies.

Summer supply planning: Ensure reliable summer season water supply through ongoing coordination across bureau work groups and with wholesale customers.

Strategic planning: Maintain continuous organizational improvement through strategic planning, risk identification, and implementation of management strategies.

Participation in the Regional Water Providers Consortium: Maintain cooperative relationships with regional water providers to plan for long-term supply, implement regional water conservation programs, and build emergency preparedness and response capability.

Water rights: Manage and maintain water rights and water rights permits.

Pump Stations/Tanks Program

Section One: Program Description and Goals

The Portland water system includes 36 pump stations and 58 tanks in the distribution system. Water supply and storage are made available within the distribution system by pumping water through mains to storage facilities at higher elevations, and by tanks storing water for delivery directly to customers and/or for transport to a storage facility(s) at higher elevations. Tanks play a key role in ensuring adequate and available water supply and in maintaining adequate system pressure. Tanks provide needed storage for daily demand fluctuations and for short-term demand spikes such as fire flow. Pump stations are distributed throughout the system to lift water to serve customers at higher elevations, often by pumping into distribution tanks.

Performance Measures

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
24/7 operation of distribution pump stations and tanks to maintain water quality and perform supply and pressure adjustments as needed with zero drinking water or clean water violations.	100%	100%	100%

Section Two: Explanation of Services

This program includes capital infrastructure planning, design, construction, operation, maintenance, and repair of pump stations and tanks in the distribution system. Also included in this program are the operating, maintenance, and replacement requirements of the Supervisory Control and Data Acquisition system (SCADA), which monitors, archives, and manages the water system. This program also includes the seismic upgrade and protection of these critical assets.

The activities in this program also include:

- Maintain equipment and infrastructure utilizing Reliability Centered Maintenance (RCM) strategies. Replace critical assets before they reach failure mode.
- Monitor and control water system 24/7 via SCADA to ensure regulatory compliance and meet water quality goals.
- Ensure water tanks are cleaned per industry standard and that they meet Oregon Health Authority Water System (previously 'Sanitary') Survey requirements.
- Minimize electrical costs at our pump stations through use of efficient pumping equipment and effective operational strategies. Evaluate and utilize applicable electrical incentive programs.
- Develop and maintain system storage capacity in support of sound engineering practices, water quality standards, and Oregon Administrative Rules.
- Establish system reliability through interconnection and operational flexibility.

Regulatory Compliance Program

Section One: Program Description and Goals

Portland's drinking water system is required to meet or exceed state and federal regulatory requirements for water quality, mainly through treatment and monitoring. Drinking water is regulated by the federal Safe Drinking Water Act and Oregon Administrative Rules.

Compliance requirements of federal regulations include:

- Surface Water Treatment Rule
- Stage 1 Disinfection/Disinfection Byproducts Rule
- Stage 2 Disinfection Byproduct Rule
- Total Coliform Rule
- Endangered Species Act
- Clean Water Act
- Long Term 2 Enhanced Surface Water Treatment Rule
- Lead and Copper Rule

As a drinking water provider, the city must meet these regulatory standards to ensure the protection of public health. The bureau is also required to monitor water quality for a variety of regulated and unregulated contaminants and report results to the Oregon Health Authority or other agencies as required.

Performance Measures

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Number of violations of state and federal environmental regulations	0	0	0
Number of violations of state and federal drinking water quality regulations	0	0	0

Section Two: Explanation of Services

This program includes water quality monitoring, reporting and management; proper disposal of dechlorinated water; management of temperature and flow in the lower Bull Run River; and implementation of programs and conservation measures involving lead hazard reduction and Endangered Species Act compliance.

The goals of this program are to:

Maintain water quality: Collect and test more than 11,000 water samples each year, ensure residents use backflow devices as needed to prevent contamination.

Reduce exposure to lead: Work with community partners to reduce lead exposure from all sources, provide free lead testing.

Meet *Cryptosporidium* requirements: The bureau is planning a filtration plant to remove *Cryptosporidium* (a microbe that can cause illness) from Bull Run water. Until the plant is built, the bureau continues to monitor *Cryptosporidium*.

Meet environmental obligations: The Endangered Species Act lists some of the fish species that live in the Bull Run River. Because the Water Bureau uses water from the river, it must reduce water system impacts on fish. The bureau works to control river temperature and improve fish habitat in the Sandy River Basin. (The Bull Run River flows into the Sandy River.)

Evaluate future regulations: Review and evaluate potential and upcoming regulations that could affect water quality monitoring and operation of the water system.

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Security/Emergency Management Program

Section One: Program Description and Goals

The Security/Emergency Management Program includes protecting and safeguarding the water system and preparing for and responding to systemwide emergency occurrences.

This program provides comprehensive Emergency Management plans that prevent, protect against, mitigate, respond to, and recover from, the potential effects of all types of disasters.

This includes providing preparedness information and creating and implementing training and simulation exercises.

Performance Measures

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Security: Incidents of intrusive damage or deterrence of water quality or water delivery.	0	0	0
Emergency Management: Inadequate response impacting water quality or delivery. Bureau has planned for and is informed, equipped, and trained to deal with water system emergencies.	0	0	0

Section Two: Explanation of Services

Security includes Bull Run Watershed surveillance, field monitoring, and in-town facility field monitoring including of pump stations, tanks, Interstate, and other facilities. Security also provides continuous dispatch, video surveillance of numerous locations, and serves as first responder to intrusions and/or water emergencies.

Emergency Management activities include operating the bureau's Emergency operations center in a state of readiness; coordinating with Portland Bureau of Emergency Management (PBEM), Oregon Emergency Management (OEM), and the Federal Emergency Management Agency (FEMA); facilitating, planning and coordinating emergency management trainings and exercises; updating Bureau emergency management plans; and developing and maintaining continuity plans.

Services Program

Section One: Program Description and Goals

There are approximately 179,000 domestic services, 1,700 irrigation services, and 3,900 fire lines that transport water from the distribution main to the customer's meter or private fire line connection.

The provision of water is an essential need that is delivered by the Services Program. No building may be occupied that does not have water. The service lines connect the water system to homes, businesses, and institutions such as hospitals and schools.

Many larger buildings require built-in fire suppression systems, which are served by larger-diameter fire services that ensure the life safety and property protection of high-intensity use structures. Larger services include the installation of underground meter vaults in the right of way for ongoing access and maintenance of meters, which is particularly challenging in the utility-dense areas in the central city.

Performance Measures

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Replace or Install at least 1,250 services each year.	1,307	1,460	1,250
Repair 250 or more services each year.	299	306	250
Install 90% of new small (residential) services within 15 days of notification of applicant.	90%	86%	90%
Install 90% of commercial services within 90 days of payment from applicant.	??	??	90%

Section Two: Explanation of Services

This program includes capital infrastructure planning, design and construction, operations, maintenance, and repair of services and service lines from the distribution or supply main to the meter. This includes service installations, removals, service repairs, and service replacements.

Maintenance of the system of services is also a key function to prevent leaks that can cause damage and waste water. Throughout the system, there are a variety of material types including older copper, galvanized steel, and plastic services that require replacing due to the high failure rate of those material types. In addition, Asset Management analysis suggests that in the coming decades the bureau will be faced with increasing service failures as large sections of the system reach the end of their expected useful life, so it is important to replace as many of those services as possible.

Terminal Storage Program

Section One: Program Description and Goals

There are five terminal storage facilities that serve as primary storage points of water in town for the distribution to retail and wholesale customers. The terminal storage facilities are located at Powell Butte, Kelly Butte, Washington Park, Mayfair, and Sam Jackson.

Powell Butte Reservoir has two 50-million-gallon buried storage tanks: one built in 1981 and the second completed in 2014. Kelly Butte Reservoir was built in 2015 with buried storage of 25 million gallons. Washington Park Reservoir is scheduled for completion in 2020 and will have 12.6 million gallons of buried storage. Sam Jackson and Mayfair, built in 1964 and 1967, respectively, have total storage of 8.5 million gallons. Each terminal storage facility includes piping, mechanical control buildings, vaults, pumps, and electrical infrastructure.

Portland's in-town terminal storage facilities are managed to maintain a total of about three days of water supply to provide water service for firefighting, emergency use, and maintaining the gravity-based delivery of water.

Performance Measures

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Maintain minimum service pressure of 20 pounds per square inch (psi) during normal demands.	94%	99%	89%

Section Two: Explanation of Services

The activities of this program include the capital infrastructure planning, design and construction, operation, and maintenance of the terminal storage facilities. Maintenance includes draining, inspecting, and cleaning these facilities as well as repair and replacement of equipment.

Treatment Program

Section One: Program Description and Goals

The treatment program encompasses the bureau's efforts to provide water treatment to provide potable drinking water for over one million Oregonians. Water treatment facilities for the Bull Run supply are currently located at Headworks and Lusted Hill. The Headworks facility adds chlorine for primary disinfection. The Lusted Hill facility is where sodium hydroxide is added for pH adjustment and ammonia is added for secondary disinfection. For the groundwater supply, treatment with sodium hypochlorite, ammonia, and sodium hydroxide occur at the groundwater pump station.

Performance Measure

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Number of violations of state or federal drinking water regulations.	0	0	0

Section Two: Explanation of Services

This program provides the resources to treat water from Portland's drinking water sources in the Bull Run Watershed and Columbia South Shore Well Field to meet or exceed all state and federal regulations for drinking water. This includes continuous monitoring and optimization of treatment processes.

This program also includes capital infrastructure planning, design and construction, operation, maintenance, and repair of treatment facility systems, and associated regulatory and process control monitoring. This program will include operating and maintaining the new facilities and infrastructure constructed as part of the Corrosion Control Improvement and Bull Run Filtration Treatment Projects.

Valves/Gates/Regulators Program

Section One: Program Description and Goals

The Portland water distribution system includes approximately 1,800 large valves, 60,000 small valves (including regulator valves), and 619 pressure regulating valves. Valves are used to isolate segments of the distribution system for maintenance, and the availability of valves enables isolation of limited sections of the system to minimize the number of customers impacted when isolation is necessary. Valves allow a selective part of the water system to be shut off to keep people and property safe and are essential to preventing damage when main breaks occur, allowing crews to “throttle” down the flow of water or stop it completely to prevent damage to public and private property. Regulator valves ensure that proper system pressures are maintained for customers throughout the system.

In addition, valves provide a key safety function for crews by providing isolation that is a sufficient distance from where crews are working underground, protecting them from the potential force of the water.

Large valves are critical to controlling the flow of water on large-diameter pipe, where breaks can generate significant damage to surrounding areas. Of the approximately 1,800 large valves in the system, approximately 1,200 are deemed “critical” because their failure could result in significant consequences (such as valves near hospitals).

Performance Measure

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
Replace or install at least 350 valves each year	388	362	350
Inspect and exercise 600 large critical valves annually	763	567	600

Section Two: Explanation of Services

This program includes capital infrastructure planning, design, construction, operation, maintenance, and repair of system valves and pressure regulating stations.

Maintenance of these valves is essential to ensure their proper operation when needed, and the bureau operates each of these 1,200 valves once every two years to make sure they are functional and do not seize up due to lack of use.

Bureau staff also inspect and exercise valves at 75 critical crossings at least once every 7 years and rebuild regulator valves on a 7- or 10-year cycle based on criticality.

Water Efficiency Program

Section One: Program Description and Goals

The Water Efficiency Program contains the Water Bureau's efforts to sustain long-term availability of water resources through efficient water use by customers and the bureau. Program efforts are focused on demonstrating efficient use of state-regulated water resources to ensure ongoing long-term access to undeveloped water rights, encouraging and supporting efficient water use by customers (including focused efforts to assist low-income and small business customers in reducing water costs through efficiency), and systematic assessment and improvement of water system loss and leakage rates.

Performance Measures

	FY 2016-17 Actual	FY 2017-18 Actual	FY 2018-19 Target
(To come)			

Section Two: Explanation of Services

Promoting efficiency in the community: Staff members in this program support community members by distributing water efficiency devices, rebates, and information. The program focuses on helping low-income and commercial customers control their water use.

Reducing water loss: All water systems lose some water to leaks. Water Efficiency Program staff are currently planning and implementing a water loss control plan for Portland's system.

Complying with city and state requirements: This group manages efficiency-related compliance with the bureau's state-mandated Water Management and Conservation Plan and the City's water sustainability goals.