2017 Annual

Water Quality Report

Drinking Water Quality Data from 2016

CITY OF Salem AT YOUR SERVICE

Public Works Department

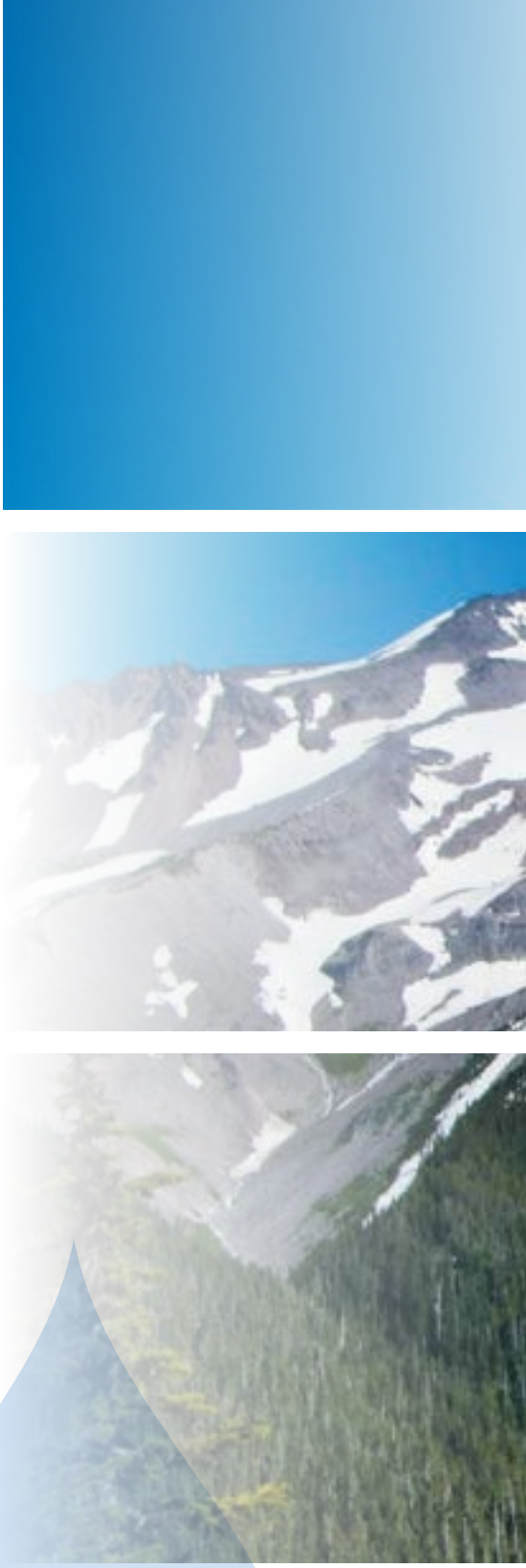
To our valued customers,

I am pleased to present the 2017 Annual Water Quality Report to you. The report contains important information about your drinking water, including where it comes from, how it is treated, and what, if any, contaminants it may contain. While many components of the report are mandated by the Environmental Protection Agency (EPA), the City of Salem prides itself in providing a more comprehensive report that is accessible to all our customers.

In 2016, City of Salem drinking water met or surpassed every public health requirement—more than 120 drinking water standards—set by the Oregon Health Authority and the EPA.

Water is the most valuable natural resource in the world today, and the City of Salem is fortunate to have an extremely high-quality, reliable, and abundant source. It's easy to take this precious resource for granted until you learn about the troubles other areas of the United States and the world are experiencing with their water supply. We often forget about the treatment process, hundreds of miles of water mains, pump stations, reservoirs, and dedicated staff it takes to deliver water to the average residential customer for less than a penny a gallon.

As always, the City of Salem strives to deliver high-quality water to your tap, as well as provide prompt service to our valued customers. For more information about Salem's drinking water, please visit **www.cityofsalem.net**.



Respectfully,

Dwayne Barnes
Utility Operations Manager, AIC
City of Salem Public Works Department

503-588-6211

Precipitation that falls in the
mountains
supplies most of our fresh water

H_2O

Water is the
most valuable
natural resource
in the world today

City of Salem Continues with Electronic Delivery of Annual Water Quality Report

The City of Salem is constantly exploring new ways to provide its customers with the best customer service while keeping costs low. After success last year with electronic delivery of the Annual report, the City is providing the same type of delivery for this year's Report. This favorable conversion will streamline the delivery of the Report, providing quicker access, and will significantly reduce costs associated with printing and mailing. The report is available on the City's website under Community Resources. However, if you prefer, hard copies are available at the Salem Civic Center, or you can request one by calling (503) 588-6333.

An average American uses
176 gallons
of water every day

Important Information Regarding Drinking Water

DRINKING WATER, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the U.S. Environmental Protection Agency (EPA) Safe Drinking Water Hotline at **1-800-426-4791**.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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 and Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at **1-800-426-4791**.

¿Español?

Este documento contiene informacion importante sobre su agua potable. Si usted desea recibir una copia de este documento en español, por favor, llame al **503-588-6323** y pida una copia del reporte de calidad de agua o visite nuestra pagina electronica **www.cityofsalem.net/water**.

This document contains information about your potable water. If you would like to receive a copy of this document in Spanish, please call **503-588-6323** and ask for a water quality report or visit our website at **www.cityofsalem.net/water**.

Please Share!

If you are a manager or owner of a business or multifamily dwelling, please share this report with your employees or residents. If you would like additional copies, please call the Water Quality Hotline at **503-588-6323**.

What the EPA Wants You to Know about Contaminants in Source Waters

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. Contaminants that may be present in source water include:

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 runoff, 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 which 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.

In order to ensure tap water is safe to drink, the EPA establishes regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations set limits for contaminants in bottled water that must provide the same protection of public health.

Understanding Salem's Source Water Assessment

THE CITY OF SALEM'S SOURCE WATER ASSESSMENT was completed in 2003 with assistance from the Oregon Department of Environmental Quality. It provides an inventory of potential contaminant sources that could pose a risk to water quality of the North Santiam, which is Salem's primary drinking water source. As required by the Federal Safe Drinking Water Act, the assessment also identifies sensitive areas where the water supply may be more vulnerable to impact by these potential contaminant sources. These sensitive areas include those close to bodies of water, and areas where runoff and erosion potentials are highest.

Contaminants in Drinking Water

The City continues to monitor activities that may impact its drinking water source, within the North Santiam River Watershed. Activities that contribute to contaminant sources such as runoff and erosion, which increases sediment and turbidity, includes loose dirt, topsoil, minerals, sand and silt from roads and highways. It can also result from excessive removal of vegetation from grazing animals, forest practices, and farming practices.

The City works together with federal and state agencies, as well as other groups and individuals to reduce these impacts to the drinking water source. City staff also samples and monitors at various sites within the City to assure safe and high quality water be provided to its customers.

Salem's Source Water Assessment is available on the City's website at www.cityofsalem.net/water. The report is also available by calling the Water Quality Hotline at **503-588-6323**, or by emailing a request to **water@cityofsalem.net**.

Salem's Sources for Drinking Water

FOR MORE THAN 75 YEARS, the City of Salem has been getting its drinking water supply from the North Santiam River. This unique river source flows roughly 90 miles from the high ridges of the Cascade Range down to the Mid-Willamette Valley towards Salem; an area of about 760 square miles. It provides high-quality river water for many communities along its route, and specifically for Salem, this high quality water is suitable for a more natural filtering process, called slow sand filtration, at the Geren Island Water Treatment Facility. Following slow sand filtration, the water is further disinfected by adding sodium hypochlorite (liquid chlorine), fluorosilicic acid (liquid fluoride) for fluoridation, and sodium carbonate (soda ash) which adjusts the pH and minimizes the corrosion of lead and copper from household plumbing.

Additionally, the City utilizes an Aquifer Storage and Recovery (ASR) system, which is located in south Salem. During the winter months, when flows in the river are high and there is a low demand for water by customers, treated drinking water is injected into the ASR system. The water is stored in a naturally existing aquifer located 350 feet below Woodmansee Park. During the summer months, when the river is flowing low and customer water demand is high, water is pumped back to the surface and recovered from the ASR system. The recovered water is treated with calcium hypochlorite (chlorine) for disinfection and then conveyed to the distribution system, serving the south Salem water customers.

Where Does Salem's Water Come From?

The supply of water begins with a raindrop that falls within the North Santiam Watershed boundary, on the west side of the Cascade Range. It flows over land and through soil into the North Santiam River. It is stored briefly at Detroit Dam until it is released to flow towards other small cities and City of Salem.

Salem's Water System *serves a population of 192,000 daily from the North Santiam River Watershed*

What Is in Salem's Drinking Water?

2016 Water Quality Data

from Geren Island Treatment Facility, Distribution System, and Salem Water Customers

TEST	DATE TESTED	UNIT	MCLG (MRDLG)	MCL (MRDL)	DETECTED LEVEL	LOWEST RANGE	HIGHEST RANGE	VIOLATION	MAJOR SOURCES
Inorganic									
Fluoride[1]	2016	ppm	4	4	Average: 0.64	0.50	0.71	NO	Erosion of natural deposits; water additive—promotes strong teeth
Nitrate	2016	ppm	10	10	0.10	One sample collected		NO	Runoff from fertilizer use; leaching from septic tanks; erosion of natural deposits
Nitrate-Nitrite	2016	ppm	10	10	0.10	One sample collected		NO	Runoff from fertilizer use; leaching from septic tanks; erosion of natural deposits
Barium	2016	ppm	2	2	0.002	One sample collected		NO	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Copper	2016	ppm	1.3	AL = 1.3	90th Percentile: 0.342 Homes exceeding: 0	< 0.03	0.56	NO	Corrosion of household plumbing systems
Lead	2016	ppb	0	AL = 15	90th Percentile: 5.9 Homes exceeding: 2	< 1.0	23	NO	Corrosion of household plumbing systems
Microbiological									
Turbidity	2016	NTU	N/A	TT	100% of samples meet turbidity standards Average: 0.13	0.05	0.34	NO	Erosion and soil runoff
Total coliform	Through March 31, 2016	No units	0	Presence of coliform bacteria in > 5% of monthly samples	360 samples collected; no coliform bacteria were present in any samples	None	None	NO	Naturally present in the environment
Fecal coliform or *E. coli* bacteria				0	Fecal coliform or *E. coli* bacteria were not detected				Human or animal fecal waste
Total coliform	Starting April 1, 2016		N/A	TT	1,080 samples collected; no coliform bacteria were present in any samples				Naturally present in the environment
E. coli bacteria			0	Routine and repeat samples are total coliform-positive and either *E. coli*-positive or the water supplier fails to collect repeat samples following *E. coli*-positive routine sample or system fails to analyze total coliform-positive repeat sample for *E. coli*	*E. coli* bacteria were not detected				Human and animal fecal waste
Disinfection By-Products, By-Product Precursors, and Disinfectant Residual									
Haloacetic acids	2016	ppb	0	60	Locational Running Annual Average: 35	3	57	NO	By-product of drinking water disinfection
Total Trihalomethanes	2016	ppb	0	80	Locational Running Annual Average: 40	14	53	NO	By-product of drinking water disinfection
Total Organic Carbon	2016	ppm	N/A	TT	Raw Water Annual Average: 1.24	0.87	2.0	NO	Naturally present in the environment
Chlorine Residual	2016	ppm	4.0	4.0	Entry Point Average: 1.18	0.41	1.57	NO	Remaining chlorine from disinfection process
Organic Constituents									
2, 4-D	2016	ppb	70	70	0.12	One sample collected		NO	Runoff from herbicide used on row crops
Unregulated Constituents									
Sodium	2016	ppm		20[2]	4.5	4.4	4.5	NO	Erosion of natural deposits

2016 Water Quality Data
from Aquifer Storage and Recovery Wells

TEST	DATE TESTED	UNIT	MCLG (MRDLG)	MCL (MRDL)	DETECTED LEVEL	LOWEST RANGE	HIGHEST RANGE	VIOLATION	MAJOR SOURCES
Inorganic									
Barium	2016	ppm	2	2	0.0021	One sample collected		NO	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Fluoride	2016	ppm	4	4	0.55	One sample collected		NO	Erosion of natural deposits; water additive—promotes strong teeth
Radioactive Constituents									
Combined Radium[2]	2014	pCi/L	0	5	1.01	One sample collected		NO	Erosion of natural deposits
Disinfection By-Products, By-Product Precursors, and Disinfectant Residual									
Haloacetic acids	2016	ppb	0	60	4.3	One sample collected		NO	By-product of drinking water disinfection
Total Trihalomethanes	2016	ppb	0	80	55	One sample collected		NO	By-product of drinking water disinfection
Total Organic Carbon	2016	ppm	N/A	TT	0.68	One sample collected		NO	Naturally present in the environment
Unregulated Constituents									
Sodium	2016	ppm		20[3]	6.8	One sample collected		NO	Erosion of natural deposits

[1] The City of Salem was conducting maintenance on the flouridation equipment from August 15, 2016–December 9, 2016.
[2] The City of Salem is required to report any detected contaminant within the last five years.
[3] EPA advisory level only.

Units of Measurement

Parts per Million (ppm)
One part per million is equal to one cup of food coloring in an Olympic size swimming pool (130,000 gallons)

Parts per Billion (ppb)
One part per billion is equal to one drop of food coloring in an Olympic size swimming pool (130,000 gallons)

Nephelometric Turbidity Unit (NTU)
The standard unit of measurement used in water analysis to measure turbidity in water samples.

Picocuries per Liter (pCi/L)
One part per billion of a curie per liter of water, used to measure radiation at very low levels.

Definitions

Maximum Contaminant Level Goal (MCLG)
The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum Contaminant Level (MCL)
The highest level of a contaminant allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Action Level (AL)
The concentration of a contaminant which, if exceeded, triggers treatment or other requirements a water system must follow.

Treatment Technique (TT)
A required process intended to reduce the level of a contaminant in drinking water.

Maximum Residual Disinfectant Level (MRDL)
The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG)
The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contamination.

City Conducts Lead and Copper Sampling in 2016

IN 2016, THE CITY OF SALEM CONDUCTED LEAD and copper sampling as mandated by the Lead and Copper Rule (LCR). From June 1, 2016 through September 30, 2016, 89 water samples were collected from Tier 1 homes and analyzed for lead and copper. Of the 89 samples, only two samples exceeded the Action Level (AL) for lead and none of the samples exceeded the AL for copper.

The Oregon Health Authority requires that the City collect and analyze a minimum of 50 water samples from Tier 1 homes. Assessments made in the 1990s identified 147 Tier 1 homes in Salem that met the qualifications for ongoing lead and copper sampling. Tier 1 homes, built between 1983 and 1985, are considered most at risk because of lead or lead-based plumbing components used during construction.

If present, elevated levels of lead can cause serious health problems, especially for pregnant woman and young children. Lead in drinking water is mostly from materials and components in service lines and home plumbing. The City of Salem 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 your exposure is available from the Safe Drinking Water Hotline at 1-800-426-4791 or at **www.epa.gov/safewater/lead**.

Free Lead Testing for Salem Water Customers

The City of Salem offers free lead testing to its water customers. If you are concerned about the levels of lead in your home and would like to request a free test, please call the Water Quality Hotline at **503-588-6323**.

Other Results

Turbidity is a measure of water's clarity. High turbidity (muddy water) results from suspended soil and organic matter in water. This can increase the risk of contamination by interfering with the drinking water treatment process. All of the City's turbidity samples were below required levels.

Radon is a naturally-occurring radioactive gas found throughout the U.S., more often in groundwater than surface water. Radon levels taken from Salem's Aquifer Storage and Recovery (ASR) wells are consistent with levels typically found in Salem area groundwater.

Cryptosporidium is a harmful microbial pathogen found in surface water throughout the U.S. Cryptosporidium may cause cryptosporidiosis, an abdominal infection. Cryptosporidium must be ingested to cause disease and may be spread through means other than drinking water. Monitoring in 2016 did not detect Cryptosporidium in untreated North Santiam River source water.

Ways to Get Involved!

Salem City Council

Salem City Council is the policy-making body for the water system. The Council meets on the second and fourth Mondays of each month at 6 p.m. (in December, the first and second Monday at 6 p.m.). The meetings are open to the public and are held in the City Council Chambers in Room 240 of the Vern Miller Civic Center at 555 Liberty Street SE, Salem, Oregon. Feel free to call at 503-588-6091, or visit **www.cityofsalem.net** for more information.

North Santiam Watershed Council

The North Santiam Watershed Council members are local volunteers who act together to provide opportunities for stakeholders to cooperate in promoting, improving and sustaining the health of the North Santiam River Watershed, and its communities. The Council hosts events such as restoration project tours and river clean-ups during the year. Watershed Council meetings are open to the public and are held every second Thursday of each month (except December) at 6 p.m. at the Stayton Community Center at 400 West Virginia Street, Stayton, Oregon. Call 503-930-8202 or visit **www.northsantiam.org**.

Water Conservation

fact:

A leaky toilet could waste up to 200 gallons of water per day

Conservation Starts at Home

On average, one person uses over 100 gallons of water per day. Each water customer in the City of Salem can help conserve water by changing daily practices at home or work. Even a posting sign about water conservation tips is helpful. Some small changes include:

- Turn off the tap while brushing your teeth or washing your hands.
- Use a shower bucket. Instead of letting water run down the drain, collect it using a bucket and then water plants, or fill watering bucket for pets.
- Wash your cars on the lawn.
- Fix leaky toilets and faucets. Surprisingly, one drip per a second can add up to a lot in a day, and a year. This could be fixed and money can be saved.
- Landscape with plants, shrubs and trees that are suitable for this climate, and don't require excess watering during the summer. Remember, one inch per week.

The City of Salem can provide leaky toilet detection tablets and drip calculators. One can determine a leak by adding food coloring in the toilet tank. If the color shows up in the bowl without flushing, you have a leak. Good resources for native plants would include organizations and agencies like Marion Soil & Conservation District. For more information, go to **www.marionswcd.net**. To learn more about the tips listed above or about water conservation, visit the EPA Water Sense website at **www.epa.gov/WaterSense.**

City Offers Free Conservation Kits to Water Customers

Retrofitting existing fixtures can help reduce the amount of water you use every day and will help save money on your utility bill. The City offers free indoor and outdoor water conservation kits to its customers. To request a free water conservation kit, please call the Water Quality Hotline at 503-588-6323, or email us at **water@cityofsalem.net**.

One Inch Per Week Program

As much as 50 percent of water used outdoors is wasted from inefficient watering methods and systems. During the summer months, a high demand of water supply to customers comes at a period when water resources are already stressed due to hotter temperatures, drier conditions, and increased demand from vegetative growth. With this in mind, it is important to maintain a careful balance of your water needs, but to also keep in mind that the water used for drinking water comes from a river that is shared by other communities, wildlife, fish, and recreational users.

There are many uses for water during the summer months, including washing cars and walkways,

filling pools, and watering gardens, lawns and landscapes. There is an effective way to decrease outdoor water usage, thus saving money, water and energy. By giving your lawn only what it needs, you will potentially improve the durability of grass, reduce the need for chemical amendments like fertilizers, and decrease lawn mowing frequency. This will also improve local stream habitats for fish and wildlife, and improve water quality healthy for all downstream users on the Willamette River. Tips to efficiently improve your landscape include:

- Raise your lawn mower blade height to three inches. Longer grass blades retain more moisture, help keep weeds to a minimum, and encourage roots to grow deeper. Keep the mower blade sharp.
- Water deeply and infrequently. This encourages deep and strong root systems. Generally, landscapes need no more than **one inch per week**.
- Replace your irrigation system's clock timer controller with a weather-based irrigation controller, or a soil moisture sensor.
- Water early in the morning or late in the evening when temperatures are cool and the sun is low.
- Use mulch around vegetated areas. Mulch help retain moisture and keeps weeds out.
- Contact Oregon State University agriculture extension or other university extensions about fertilizer guides and applications. This will determine how much fertilizer is needed and reduce excess fertilizers from being used by unwanted vegetation like algae or weeds, or washing into nearby streams. It will also save costs. Remember, you can always add more.

Request a free One Inch per Week lawn watering gauge, provided by the City of Salem. To find out more information, call the Water Quality Hotline at 503-588-6323, or email water@cityofsalem.net.

By the Numbers

43.35
million gallons
peak daily water usage
August 20, 2016

22.20
million gallons
average daily winter demand
Jan.-Apr. and Oct.-Dec. 2016

32.40
million gallons
average daily summer demand
June-September 2016

9.520
billion gallons
total water produced
by the City of Salem in 2016

Salem Families Benefit from Low-Income Assistance Program

THE LOW-INCOME UTILITY ASSISTANCE PROGRAM, sponsored by the City of Salem, is dedicated to helping individuals and families facing financial difficulties to pay their City utility bills. The program is possible due to generous utility customers making voluntary, tax-deductible donations used exclusively for low-income assistance. These donations are matched by the City of Salem up to a $10,000 maximum per year.

In 2016, a total of **$14,670.74** was distributed to **157** families and individuals who would have otherwise faced possible water service disruption. Currently, the donation amounts received are not enough to keep up with the low-income requests for distribution.

If you would like to donate to the Low-Income Utility Assistance Program or if you are in need of low-income assistance for your City of Salem utility bill, please visit our website at **www.cityofsalem.net** or contact Customer Services Utility Billing at **503-588-6099** for more information.

$14,670.74
was given to
157
low-income families

Stormwater Runoff vs. Wastewater: What's the Difference?

Salem has two separate drainage systems: one used to carry stormwater runoff, and the other to carry wastewater (sewage). Salem's wastewater system collects water used in homes, businesses, and schools and carries the water to a wastewater treatment facility where it is treated before the water is released into the Willamette River.

In some cities, the wastewater and stormwater systems are combined, but not in Salem. Salem's stormwater pipes are separate from the wastewater pipes. Unlike the sewer system, the stormwater system begins at the drains in the streets and leads directly to the nearest stream or to the Willamette River without treatment.

As stormwater runs off roofs, yards, and streets, it picks up pollutants on its path to the storm drain system, and eventually to the Willamette River. People fish, recreate, and use the Willamette as a source of drinking water. Fish and other aquatic animals depend on clean water as well. For these reasons, water pollution prevention is important! To learn more about what you can do to keep water clean, go to **www.cityofsalem.net/clean-streams**.

Want to Learn More?

US EPA

Safe Drinking Water Hotline

1-800-426-4791

www.epa.gov

Oregon Health Authority

Drinking Water Program

971-673-0405

http://public.health.oregon.gov/HealthyEnvironments/DrinkingWater

(Salem's ID# 00731)

City of Salem Public Works Department

City of Salem Website

www.cityofsalem.net

Water Quality Hotline

503-588-6323

water@cityofsalem.net

Water Conservation Hotline

503-588-6323

water@cityofsalem.net

Water Outreach and Education Program

To arrange a classroom presentation, field trip, or community service project, call 503-588-6211

THE FEDERAL SAFE DRINKING WATER ACT requires this annual water quality report be made available to every customer to provide information regarding the quality of the community's drinking water. If you would like to receive a printed copy of this report, please call **503-588-6333**. If you have any questions or comments, please email **water@cityofsalem.net** or call the Water Quality Hotline at **503-588-6323**.

CITY OF Salem AT YOUR SERVICE
PUBLIC WORKS DEPARTMENT
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SALEM OR 97302-1200

PWS – OR4100731