Drinking Water Quality Report for 2018

Federal regulations require Lake Grove Water District to provide for our customers a yearly report of our drinking water quality. We're very pleased to provide you with this year's Annual Water Quality Report for data collected in 2018. We want to keep you informed about the excellent water we have delivered to you over the past year. Our goal is and always has been, to provide to you a safe and dependable supply of drinking water. Our water source comes from the City of Portland, which primarily gets its water from the Bull Run Reservoir and City of Lake Oswego, which gets its water from the Clackamas River. The City of Lake Oswego's Water Quality Report and the City of Portland's Water Quality Report continue after Lake Grove Water District's report. We are pleased to report that our drinking water is safe and meets federal and state requirements.

We want our valued customers to be informed about their water utility. If you want to learn more, please attend any of our regularly scheduled meetings. They are held the third Monday of every month at 6:00 PM at 15555 Bangy Rd, Lake Oswego, OR 97035. The District office is located at 4550 Kruse Way, Suite 360, Lake Oswego, OR 97035.

Lake Grove Water District routinely monitors for microbiological constituents in your drinking water and for disinfection by-products, according to federal and state laws. In 2017, we started monitoring for lead and copper apart from the City of Portland. While all test results are within the allowable levels, some reporting occurred after reports were due to the Oregon Drinking Water Program. Please review the reports from both the City of Lake Oswego and the City of Portland. The test results demonstrate the high quality of the water we purchase from each of those cities. All drinking water, including bottled drinking water, may be reasonably expected to contain at least small amounts of some constituents. It's important to remember that the presence of these constituents does not necessarily pose a health risk. The residual of disinfection by-products was well below the Maximum Contaminate Level (MCL) of 80 parts per billion (ppb). On the basis of our own testing no contaminated water from Portland was introduced into our distribution system.

Lake Grove Test Results

Variable	Amount Detected		MCL	MCLG	Possible Source of Contamination
	Minimum	Maximum			
Microbiological Contaminants					
Total Coliform Bacteria	N/D	N/D	0	0	Naturally present in the environment
Fecal Coliform and E.coli	N/D	N/D	0	0	Human and animal fecal waste

Contaminant	MCL	MCLG	Maximum Detected (Average)	Violation Yes/No	Source of Contamination
TTHM	80 ppb	0	19.2	No	By-product of drinking water chlorination
HAA5	60 ppb	0	11.6	No	By-product of drinking water chlorination

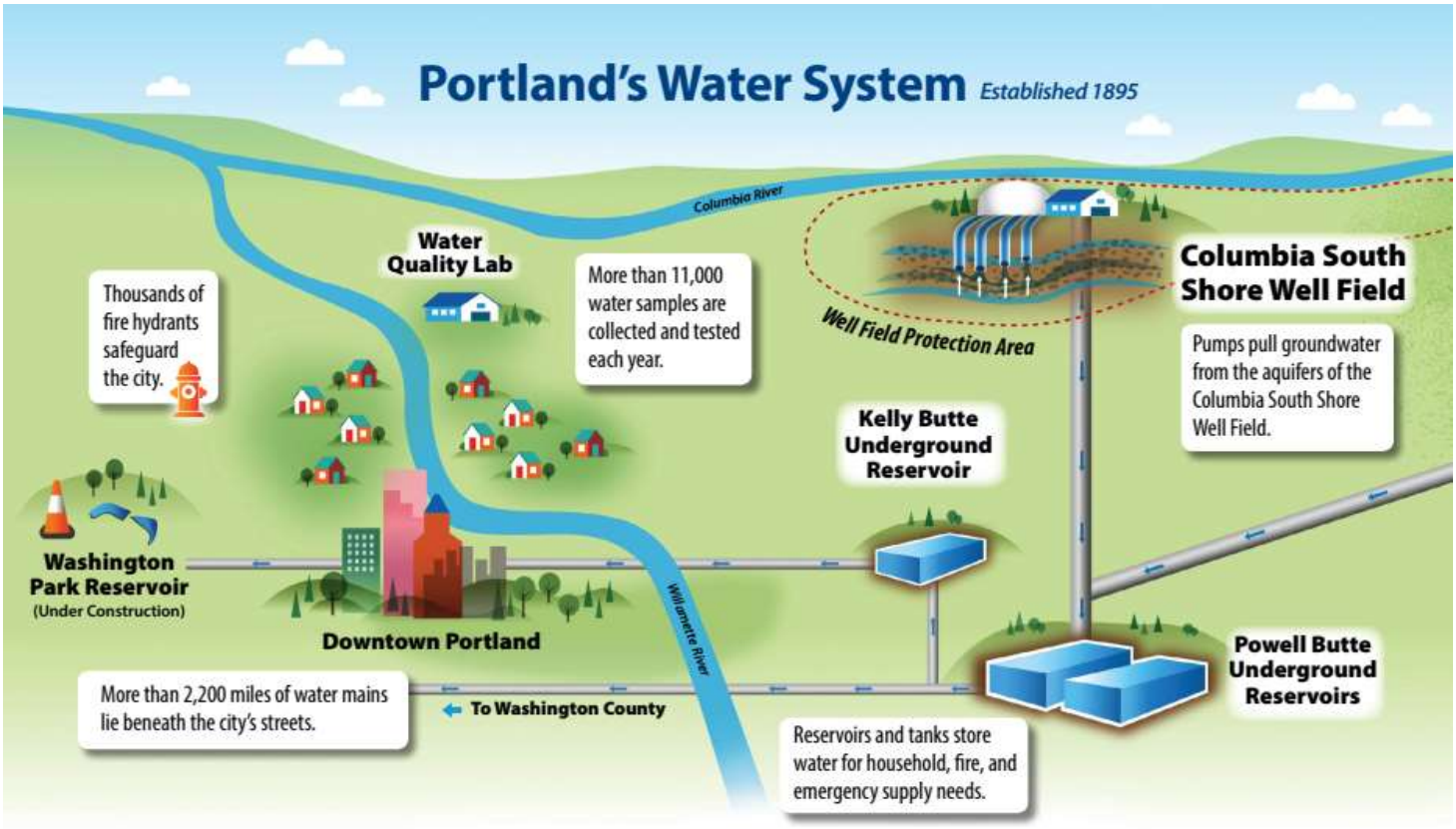
Contaminant	Action Level	Date Range	Number of Samples	90th Percentile Level (mg/L)	Violation Yes/No	Possible Source of Contamination
Lead	0.015	May 2018	20	0.0080	No	Home plumbing
Copper	1.300	May 2018	20	0.0640	No	Home plumbing

Lake Grove Water District had one reporting violation in 2018.

Water Quality Reports from the City of Portland and the City of Lake Oswego are on the following pages.

PORTLAND WATER BUREAU

2019 Drinking Water Quality Report



From the Commissioner

Thank you for your interest in the Portland Water Bureau's *2019 Drinking Water Quality Report*. Portlanders have two reliable and safe sources of drinking water: the Bull Run Watershed and the Columbia South Shore Well Field. Our drinking water is some of the best in the world! Your ratepayer dollars are dedicated to ensuring the delivery system is reliable, and delicious water is available to everyone - now, and for generations to come. Please read on to learn more about how the system works and the many projects underway to further protect your water resources and health.

Note: The federal Environmental Protection Agency requires specific wording for much of this Report. For more information, or if you have concerns about water quality or paying your bill, see **portlandoregon.gov/water**, call **503-823-7770**, or contact me at **Amanda@portlandoregon.gov**, **503-823-3008**.

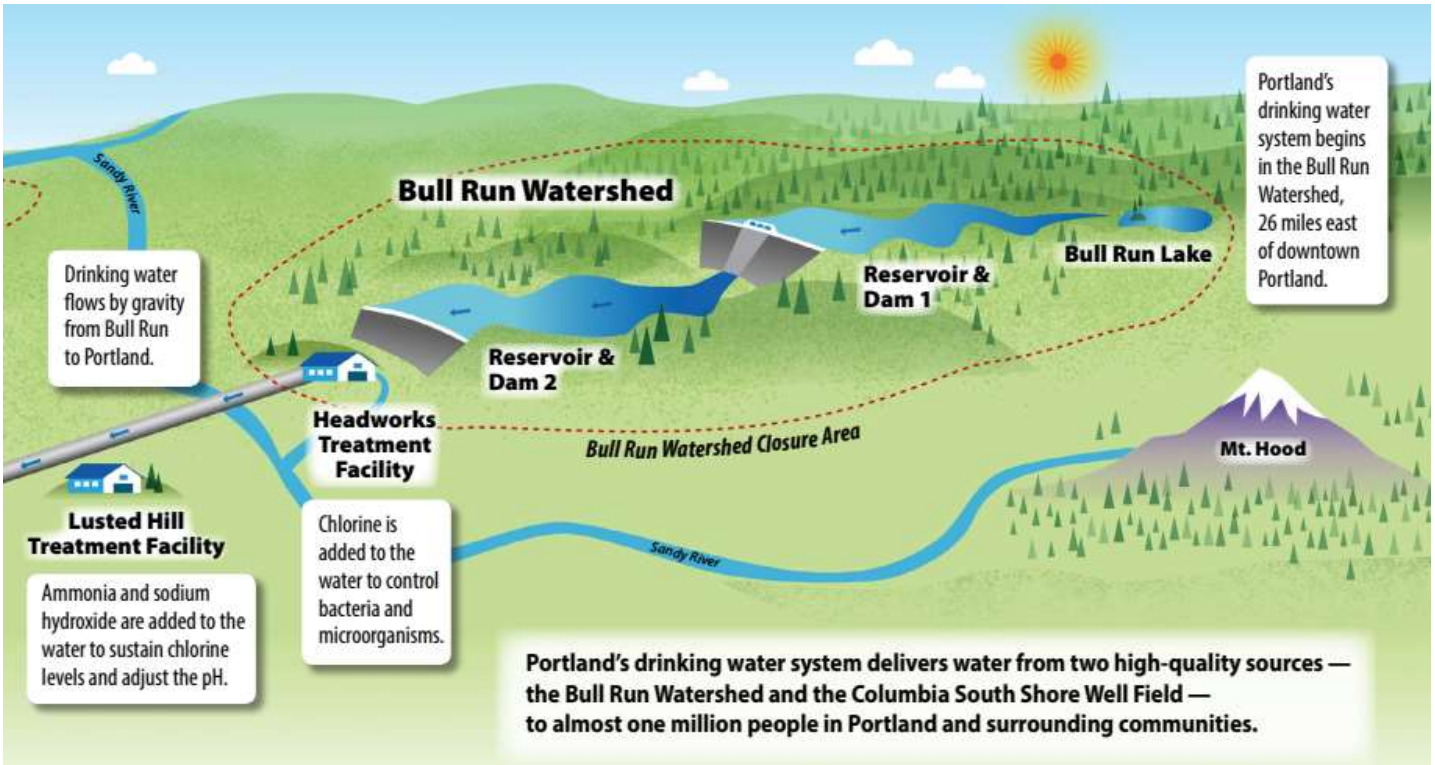
Amanda Fritz
COMMISSIONER-IN-CHARGE

From the Director

I am proud to share the *2019 Drinking Water Quality Report* with you. In this report, you will learn how the Portland Water Bureau protects, monitors and treats the water that flows from the Bull Run Watershed and the Columbia South Shore Well Field to your home, school or workplace. You will also get a glimpse of the work being done to improve our system to ensure that we can provide high-quality drinking water that meets or surpasses all drinking water standards for decades to come. Read on to learn more about the water system and how you can join us in protecting and conserving this valuable resource.

Michael Stuhr, PE
DIRECTOR

Cover photo credits: (top) Hassan Basagic; (bottom, clockwise from top left): Sally Painter, Jon Clark, Sally Painter, Hassan Basagic, Bruce Forster



Portland's drinking water system delivers water from two high-quality sources — the Bull Run Watershed and the Columbia South Shore Well Field — to almost one million people in Portland and surrounding communities.

Portland's Drinking Water Sources

The Bull Run Watershed, Portland's protected surface water supply, is located in the Mt. Hood National Forest, 26 miles from Portland. The watershed is carefully managed to sustain and supply clean drinking water to a quarter of Oregon's population. In a typical year, the watershed receives an astounding 135 inches of precipitation (rain and snow), that flows into the Bull Run River and then into two reservoirs that store nearly 10 billion gallons of drinking water.

A Source Water Assessment completed in 2003 (available at **portlandoregon.gov/water/sourcewaterassessment** or by calling **503-823-7525**) identifies the only contaminants of concern as naturally-occurring microbes such as *Giardia*, *Cryptosporidium*, fecal coliform bacteria, and total coliform bacteria. These organisms are found in virtually all freshwater ecosystems and may be present in the Bull Run supply at low levels. The Bull Run Watershed is an unfiltered drinking water source that is currently not treated for *Cryptosporidium*. However, the Portland Water Bureau is working to install drinking water filtration by September 2027. See page 9 for more information.

The Clackamas River Water District, City of Gresham, City of Lake Oswego, City of Milwaukie, Rockwood Water People's Utility District, Sunrise Water Authority, and Tualatin Valley Water District provide drinking water to some Portland customers who live near service area boundaries. Customers who receive water from these providers will also receive detailed water quality reports about these sources in addition to this report.

The Columbia South Shore Well Field, Portland's protected groundwater supply, provides high-quality drinking water from 25 active wells located in three different aquifers. Located on the south shore of the Columbia River, the well field is the second largest drinking water source in Oregon and can produce up to 80 million gallons of water per day. The well field is used to supplement, or as an alternative to, the Bull Run supply during routine maintenance, turbidity events, emergencies, and when Portland needs additional summer supply.

In collaboration with Gresham and Fairview, the Portland Water Bureau works with businesses in the area to prevent hazardous material spills that could seep into the ground and impact groundwater. Portland also holds public events such as Aquifer Adventure, Cycle the Well Field, and Groundwater 101 to educate residents on how they can get involved. To learn more about the Well Field Protection Program or find upcoming events, visit **portlandoregon.gov/water/groundwater** or call **503-823-7473**.

Get email updates when we make changes to our source water or treatment. Sign up at **portlandoregon.gov/water/notification**

Frequently Asked Questions About Water Quality

What test results are included in this report?

The Portland Water Bureau monitors for over 200 regulated and unregulated contaminants in drinking water. All monitoring data in this report are from 2018. **If a known, health-related contaminant is not listed in this report, the Portland Water Bureau did not detect it in drinking water**.

How is Portland's drinking water treated?

Currently, Portland's drinking water treatment is a three-step process. **1) Chlorine** is added for disinfection. **2) Ammonia** is added to form chloramines, which ensure that disinfection remains adequate throughout the distribution system. **3) Sodium hydroxide** is added to increase the pH of the water, reduce corrosion of plumbing materials, and control lead and copper levels when present in plumbing materials. See page 10 for more information about lead. See page 9 for upcoming treatment changes.

Is Portland's water treated by filtration?

No. Neither the groundwater nor the Bull Run source water is currently filtered. Groundwater is not required to be filtered. Since 1992, the Bull Run source has continued to meet the filtration avoidance criteria of the Surface Water Treatment Rule. However, in response to a series of *Cryptosporidium* detections in 2017, Portland is installing filtration for Bull Run by 2027. See pages 8 and 9 for more information.

Is fluoride added to Portland's drinking water?

No, fluoride is not added to the water. Fluoride is a naturally occurring trace element in surface water and groundwater. You may want to consult with your dentist about fluoride treatment to help prevent tooth decay, especially for young children.

Is Portland's water soft or hard?

Portland's water is very soft. The hardness of Bull Run water is typically 3–8 parts per million (ppm), or approximately ¼ to ½ a grain of hardness per gallon. Portland occasionally supplements the Bull Run supply with groundwater. Portland's groundwater hardness is approximately 80 ppm (about 5 grains per gallon), which is considered moderately hard.

What is the pH of Portland's water?

The pH of Portland's drinking water typically ranges between 7.5 and 8.5.

How can I get my water tested?

For free lead-in-water testing, contact the LeadLine at **leadline.org** or **503-988-4000**. For more extensive testing, private laboratories can test your tap water for a fee. Not all labs are accredited to test for all contaminants. For information about accredited labs, contact the Oregon Health Authority at **ORELAP.Info@state.or.us** or **503-693-4100**.

What causes temporary discolored water?

Since Portland's water is not filtered, sediment and organic material from the Bull Run Watershed are present in Portland's water supply. This can sometimes be seen in the fall as a harmless tea-colored tint. Sediment that has settled at the bottom of the water mains can be temporarily stirred up when the flow of water changes due to hydrant use, construction activities, firefighting, or main breaks. Corrosion of older pipes inside buildings can also cause rusty water after water has been sitting in the pipes for several hours. More information is available at **portlandoregon.gov/water/discoloredwater**.

Have water quality or pressure issues or concerns?

Contact the
Water Quality Line
WBWaterLine@portlandoregon.gov
503-823-7525
portlandoregon.gov/water/WQfaq

If you turned on your faucet and the water was discolored, or the flow was less than normal, would you know what to do?

Check out our
CUSTOMER GUIDE TO Water Quality and Pressure
for maintenance and troubleshooting tips.

Find it online: **portlandoregon.gov/water/guide**.
Call **503-823-7525** to request a paper copy.

What the EPA Says Can Be Found in Drinking Water

Across the United States, 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 from human activity.

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

Contaminants in drinking water sources may include: **microbial contaminants**, such as viruses, bacteria, and protozoa from wildlife; **inorganic contaminants**, such as naturally-occurring salts and metals; **pesticides and herbicides**, which may come from farming, urban stormwater runoff, or home and business use; **organic chemical contaminants**, such as byproducts from industrial processes or the result of chlorine combining with naturally-occurring organic matter; and **radioactive contaminants**, such as naturally-occurring radon.

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 Environmental Protection Agency's Safe Drinking Water Hotline at **800-426-4791** or at **epa.gov/safewater**.

Portland's New Flushing Program

New flushing crews are hitting the streets to start the ambitious task of cleaning the inside of Portland's water distribution pipes – all 2,200 miles of them! This project is part of an effort to prepare Portland's drinking water infrastructure for improved treatment and a new filtration plant in 2027. See page 9 for more information.

Across the country, water providers clean the inside of water mains by flushing water out of hydrants at high speeds. In unfiltered water systems, such as Portland's, silt and other organic material accumulates at the bottom of the water mains. This material can impact water quality and cause customers to see discolored water at the tap when it is stirred up by construction or other activities. The high-speed flushing, called unidirectional flushing, scours the insides of the pipes and removes the accumulated materials from the water mains. This routine cleaning improves the health of Portland's system now and ensures the health and integrity of the system for the future.

Typically, customers will not see an impact to their tap water while unidirectional flushing is happening in their neighborhood. However, there may be rare instances when customers report discolored water or lower pressure. If you experience either of these, contact the Water Quality Line. See page 4 for contact information.

More information: **portlandoregon.gov/water/flushing**
Find out where crews are flushing: **portlandoregon.gov/water/WaterWorks**

Contaminants Detected in 2018

Regulated Contaminant	Detected in Portland's Water		EPA Standard		Sources of Contaminant
	Minimum	Maximum	MCL or TT	MCLG	
Untreated Source Water from the Bull Run Watershed					
Turbidity (NTU)	0.19	1.01	5	N/A	Erosion of natural deposits
Fecal Coliform Bacteria (% >20 colonies/100 mL in 6 months)	Not Detected	1.64%	10%	N/A	Animal wastes
Giardia (#/L)	Not Detected	0.18	TT	N/A	Animal wastes
Treated Drinking Water from Bull Run Watershed and Columbia South Shore Well Field Entry Points to the Distribution System					
Arsenic (ppb)	<0.50	1.31	10	0	Found in natural deposits
Barium (ppm)	0.00074	0.01240	2	2	
Copper (ppm)	<0.00050	0.00071	N/A	1.3	
Fluoride (ppm)	<0.025	0.150	4	4	
Nitrate – Nitrogen (ppm)	<0.010	0.450	10	10	Found in natural aquifer deposits; animal wastes
Treated Drinking Water from Points throughout the Distribution System of Reservoirs, Tanks and Mains					
Microbiological Contaminants					
Total Coliform Bacteria (% positive per month)	Not Detected	0.74%	N/A	N/A	Found throughout the environment
Disinfectant Residual					
Total Chlorine Residual running annual average (ppm)	1.71	1.74	4 [MRDL]	4 [MRDLG]	Chlorine used to disinfect water
Total Chlorine Residual at any one site (ppm)	0.30	2.42	N/A	N/A	
Disinfection Byproducts					
Haloacetic Acids					
Running annual average at any one site (ppb)	21.3	37.7	60	N/A	Byproduct of drinking water disinfection
Single result at any one site (ppb)	11.5	51.2	N/A		
Total Trihalomethanes					
Running annual average at any one site (ppb)	23.6	37.7	80	N/A	Byproduct of drinking water disinfection
Single result at any one site (ppb)	14.2	44.5	N/A		

Unregulated Contaminant	Detected in Portland's Water			Sources of Contaminant
	Minimum	Average	Maximum	
Treated Drinking Water From Bull Run Watershed and Columbia South Shore Well Field Entry Points to the Distribution System				
Radon (piC/L)	<50	150	300	Found in natural deposits
Sodium (ppm)	3.4	6.8	16	

For more detailed water quality analyses, view our Triannual Reports at **portlandoregon.gov/water/triannual**.

Definitions

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

MCLG: Maximum Contaminant Level Goal
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.

MRDL: Maximum Residual Disinfectant Level
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.

MRDLG: Maximum Residual Disinfectant Level Goal
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 contaminants.

N/A: Not Applicable
Some contaminants do not have a health-based level or goal defined by the EPA.

NTU: Nephelometric Turbidity Units
The unit of measurement of turbidity or cloudiness in water as measured by the amount of light passing through a sample.

ppm: Parts Per Million
One part per million corresponds to one penny in $10,000 or approximately one minute in two years. One part per million is equal to 1,000 parts per billion.

ppb: Parts Per Billion
One part per billion corresponds to one penny in $10,000,000 or approximately one minute in 2,000 years.

piC/L: Picocuries Per Liter
Picocurie is a measurement of radioactivity. One picocurie is one trillion times smaller than one curie.

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

Notes on Contaminants

Arsenic, Barium, Copper, and Fluoride
These metals are elements found in the earth's crust. They can dissolve into water that is in contact with natural deposits. At the levels found in Portland's drinking water, they are unlikely to contribute to adverse health effects.

Fecal Coliform Bacteria
As part of Portland's compliance with the filtration avoidance criteria of the Surface Water Treatment Rule, water is tested for fecal coliform bacteria before disinfectant is added. The presence of fecal coliform bacteria in source water indicates that water may be contaminated with animal wastes. This is measured in percent of samples with more than 20 colonies in 100 milliliters of water during any six-month period. The Portland Water Bureau uses chlorine to control these bacteria.

Giardia
Wildlife in the watershed may be hosts to *Giardia*, the organism that causes giardiasis. The treatment technique (TT) is to remove 99.9 percent of the organisms. The Portland Water Bureau uses chlorine to control these organisms.

Haloacetic Acids and Total Trihalomethanes
Haloacetic acids and trihalomethanes are regulated disinfection byproducts that have been detected in Portland's water. During disinfection, certain byproducts form as a result of chemical reactions between chlorine and naturally-occurring organic matter in the water. These byproducts can have negative health effects. Adding ammonia to chlorine results in a more stable disinfectant and helps to minimize the formation of disinfection byproducts.

Nitrate - Nitrogen
Nitrate, measured as nitrogen, can support microbial growth (bacteria and algae). Nitrate levels exceeding the standards can contribute to health problems. At the levels found in Portland's drinking water, nitrate is unlikely to contribute to adverse health effects.

Radon
Radon is a naturally occurring radioactive gas that cannot be seen, tasted, or smelled. Radon can be detected at very low levels in the Bull Run water supply and at varying levels in Portland's groundwater supply. Based on the historical levels of radon in groundwater combined with the limited amount of groundwater used, radon is unlikely to contribute to adverse health effects. For information about radon, call the EPA's Radon Hotline **(800-SOS-RADON)** or **epa.gov/radon**.

Sodium
There is currently no drinking water standard for sodium. Sodium is an essential nutrient. At the levels found in drinking water, it is unlikely to contribute to adverse health effects.

Total Chlorine Residual
Total chlorine residual is a measure of free chlorine and combined chlorine and ammonia in Portland's distribution system. Chlorine residual is a low level of chlorine remaining in water and is meant to maintain disinfection through the entire distribution system.

Total Coliform Bacteria
Coliforms are bacteria that are naturally present in the environment. They are used as an indicator that other potentially-harmful bacteria may be present. If more than 5 percent of samples in a month are positive for total coliforms, an investigation must be conducted to identify and correct any possible causes. The Portland Water Bureau uses chlorine to control these bacteria.

Turbidity
Turbidity is a measure of the water's clarity. Increased turbidity is typically caused by large storms that suspend organic material in the Bull Run source water. This can interfere with disinfection and provide an environment for microbial growth. Since Bull Run water is not filtered, the treatment technique (TT) is that turbidity cannot exceed 5 NTU more than 2 times in 12 months. The Portland Water Bureau shuts down the Bull Run system and serves water from the Columbia South Shore Well Field when turbidity in the Bull Run rises.

Monitoring for *Cryptosporidium*

Drinking water treatment for *Cryptosporidium*, a potentially disease-causing microorganism, is regulated by the Long-Term 2 Enhanced Surface Water Treatment Rule (LT2). This rule requires systems that use an unfiltered surface water source, such as the Portland Water Bureau's Bull Run, to treat for *Cryptosporidium*.

In March 2012, based on the results of a year-long intensive sampling for *Cryptosporidium* and the limited sources and low occurrence of *Cryptosporidium* in the Bull Run Watershed, the Oregon Health Authority (OHA) issued the Portland Water Bureau a variance from the requirements to treat for *Cryptosporidium*. In May 2017, the Portland Water Bureau was informed by OHA that the variance was being revoked as a result of a series of low-level detections of *Cryptosporidium* in January through March of 2017. The number of *Cryptosporidium* oocysts detected showed that the Portland Water Bureau was no longer able to demonstrate an equivalent level of *Cryptosporidium* from untreated Bull Run water that would be expected with treatment.

As a result, the Portland Water Bureau does not currently treat for *Cryptosporidium*, but is required to do so under drinking water regulations. Portland is working to install filtration by 2027 under a compliance schedule with OHA (see page 9). In the meantime, the Portland Water Bureau is implementing interim measures such as watershed protection and additional monitoring to protect public health. Consultation with public health officials continues to conclude that the general public does not need to take any additional precautions.

More information:
www.portlandoregon.gov/water/crypto

Exposure to *Cryptosporidium* can cause cryptosporidiosis, a serious illness. Symptoms can include diarrhea, vomiting, fever, and stomach pain. People with healthy immune systems recover without medical treatment. According to the Centers for Disease Control and Prevention (CDC), people with severely weakened immune systems are at risk for more serious disease. Symptoms may be more severe and could lead to serious life-threatening illness. Examples of people with weakened immune systems include those with AIDS, those with inherited diseases that affect the immune system, and cancer and transplant patients who are taking certain immunosuppressive drugs.

The Environmental Protection Agency has estimated that a small percentage of the population could experience gastrointestinal illness from *Cryptosporidium* and advises that customers who are immunocompromised and receive their drinking water from the Bull Run Watershed consult with their health care professional about the safety of drinking the tap water.

2018 Results of *Cryptosporidium* Monitoring at the Raw Water Intake

Number of Samples		Concentration Detected (oocysts/L)	
Total Tested	Positive for *Cryptosporidium*	Minimum	Maximum
271	15	Not Detected	0.09

Special Notice for Immuno-Compromised Persons

Some people may be more vulnerable to contaminants in drinking water than the general population.

Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly people and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. Environmental Protection Agency (EPA)/ Centers for Disease Control and Prevention (CDC) 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 **800-426-4791**.

Drinking Water Treatment: Making Excellent Water Better

Portland's water treatment is adapting to changes in science, technology, and water quality. The Portland Water Bureau is working on two water treatment projects designed to keep Portland's water safe for generations to come.

1 Reducing lead levels with improved corrosion control treatment by 2022.

In Portland, the main source of lead in water is corrosion (wearing away) of household plumbing. When buildings have lead in their plumbing, lead can dissolve into the water. Improved corrosion control treatment will increase the pH of the water and add alkalinity to make lead less likely to dissolve into water. See pages 10 and 11 for more information about lead.

2 Keeping water safe with filtration by 2027.

By removing sediment, organic material, and microorganisms such as *Cryptosporidium*, Portland's future filtration plant will provide consistent, high-quality drinking water while making the water system more reliable.

Progress being made on treatment:

Explored treatment plants around the region.

Portland Water Bureau engineering and operations staff toured several treatment plants in Oregon and Washington, including Lake Oswego's filtration plant (pictured above), to learn about best practices and different filtration processes and technologies.

City Council approves recommendations.

The Bull Run Filtration team presented filtration updates and recommendations to City Council. In December, City Council authorized key elements of the filtration plant including the capacity, the location, and the type of filtration.

Listened to our customers about what is important to them.

Portland Water Bureau reached out to customers through online surveys, a Community Water Forum, and a series of information sessions to hear input from community members and answer questions about upcoming work.

Planning for which treatment option is best for Portland's water.

Portland Water Bureau project staff brought together water quality experts to discuss a range of treatment options. Water Bureau water quality engineers also began testing to evaluate which treatment processes work best for our water.

Started designing the improved corrosion control treatment facility.

Portland Water Bureau is almost halfway complete with the design of the improved corrosion control treatment facility, which will further adjust the water chemistry to reduce lead levels at customers' taps.

More information: **portlandoregon.gov/water/BullRunTreatment**

Reducing Exposure to Lead

Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. While lead is rarely found in Portland's source waters and there are no known lead service lines in the water system, lead can be found in some homes. The Portland Water Bureau is responsible for providing high-quality drinking water, but cannot control the variety of materials used in plumbing components in homes or buildings. In Portland, lead enters drinking water from the corrosion (wearing away) of household plumbing materials containing lead. These materials include lead-based solder used to join copper pipe — commonly used in homes built or plumbed between 1970 and 1985 — and brass components and faucets installed before 2014.

If present, lead at elevated levels can cause serious health problems, especially for pregnant people and young children. Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

When your water has been sitting for several hours, such as overnight or after returning from work or school, 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 drinking water, you can request a free lead-in-water test from the LeadLine. Information on lead in drinking water, testing methods and steps you can take to minimize exposure is available from the **LeadLine—503-988-4000** or **leadline.org**—or the **Safe Drinking Water Hotline—800-426-4791** or **epa.gov/safewater/lead**.

In Portland, the most common sources of lead exposure are lead-based paint, household dust, soil, and plumbing materials. Lead is also found in other household objects such as toys, cosmetics, pottery, and antique furniture.

Protecting Public Health

The Portland Water Bureau's Lead Hazard Reduction Program is a comprehensive approach to reduce exposure to lead. The Portland Water Bureau provides the following through this program:

- **Corrosion Control Treatment**
  Reduces corrosion of lead in plumbing by adding sodium hydroxide, which increases the pH of the water. This pH adjustment has reduced lead in tap water by up to 70 percent. To further reduce lead levels, Portland has begun the process of improving corrosion control treatment. These improvements will be in place no later than 2022. See page 9 for more information.
- **Lead-in-Water Testing**
  Provides free lead-in-water testing to everyone, but targets testing the water in households most at-risk from lead in water. These are homes built between 1970 and 1985.
- **Education, Outreach and Testing**
  Funds agencies and organizations that provide education, outreach, and testing on all sources of lead.
- **Home Lead Hazard Reduction**
  Supports the Portland Housing Bureau's Lead Hazard Control Program to provide grants to minimize lead paint hazards in homes.

Water Testing at High-Risk Residential Water Taps

Twice each year, the Portland Water Bureau tests for lead and copper in water collected from a group of over 100 homes that have lead solder and where levels are the highest. Testing results exceed the federal action level for lead when more than 10 percent of results from these homes are above 15 parts per billion. In the most recent round of testing, less than 10 percent of homes exceeded the lead action level.

Lead and Copper Testing Results from High-Risk Residential Water Taps

Regulated Contaminant	Detected in Residential Water Taps		EPA Standard		Sources of Contaminants
	Fall 2018 Results[1]	Homes Exceeding Action Level[2]	Action Level[2]	MCLG[3]	
Lead (ppb)[3]	11.9	6 out of 121 (4.96%)	15	0	Corrosion of household and commercial building plumbing systems
Copper (ppm)[3]	0.216	0 out of 121 (0%)	1.3	1.3	

[1] 90th Percentile: 90 percent of the sample results were less than the values shown.

[2] Action Level definition: The concentration of a contaminant which, if exceeded, triggers treatment or requirements of which a water system must follow.

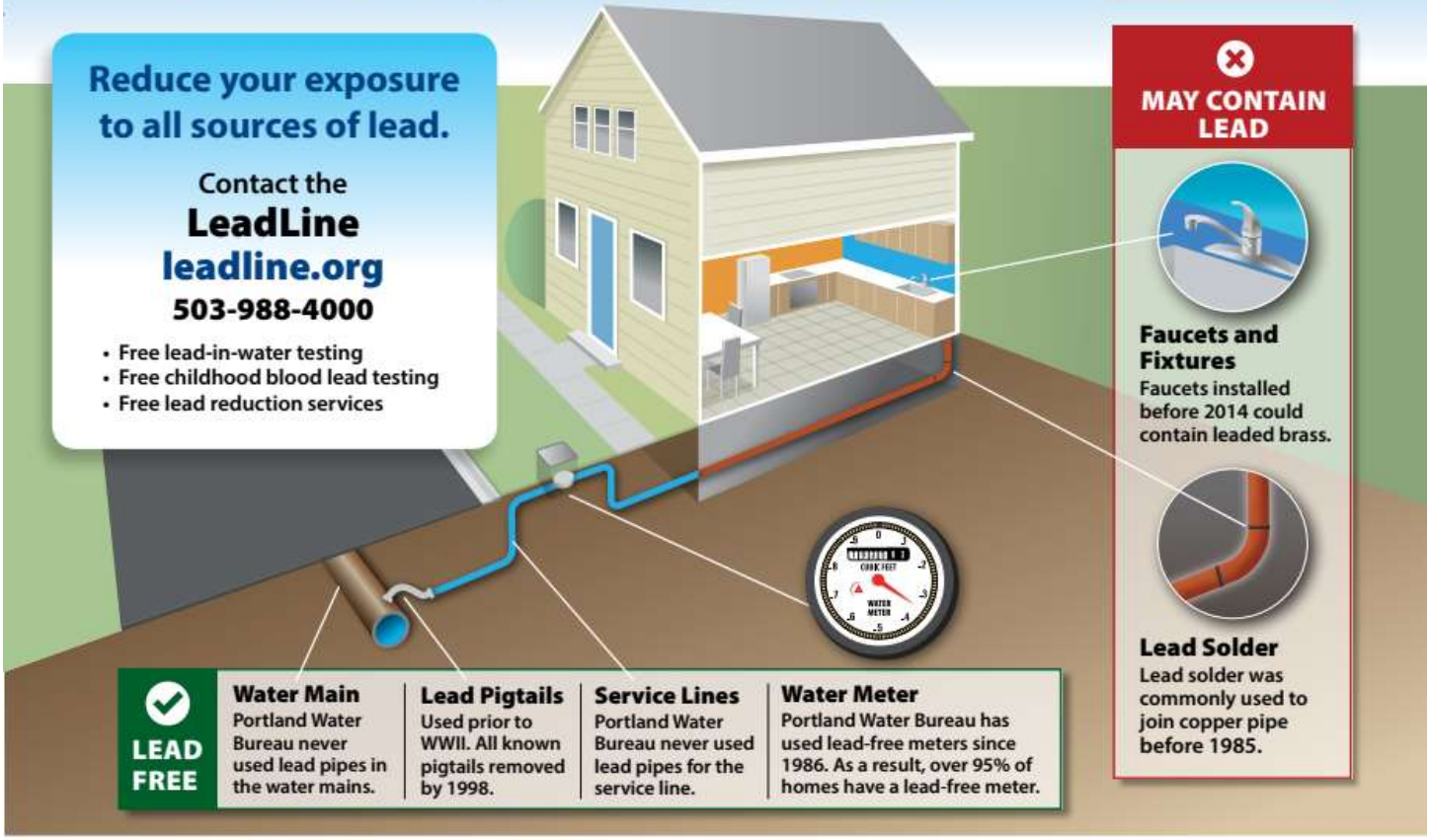
[3] See page 7 for definitions.

Home Plumbing Can Add Lead to Your Drinking Water

Reduce your exposure to all sources of lead.

Contact the
LeadLine
leadline.org
503-988-4000

- Free lead-in-water testing
- Free childhood blood lead testing
- Free lead reduction services



LEAD FREE

Water Main
Portland Water Bureau never used lead pipes in the water mains.

Lead Pigtails
Used prior to WWII. All known pigtails removed by 1998.

Service Lines
Portland Water Bureau never used lead pipes for the service line.

Water Meter
Portland Water Bureau has used lead-free meters since 1986. As a result, over 95% of homes have a lead-free meter.

MAY CONTAIN LEAD

Faucets and Fixtures
Faucets installed before 2014 could contain leaded brass.

Lead Solder
Lead solder was commonly used to join copper pipe before 1985.

Easy steps to reduce possible exposure to lead from household plumbing

Run your water to flush the lead out. If the water has not been used for several hours, run the tap for 30 seconds to 2 minutes or until it becomes colder before drinking and cooking. This flushes water which may contain lead from the pipes.

Use cold, fresh water for cooking and preparing baby formula. Lead dissolves more easily into hot water. Do not use water from the hot water tap for cooking, drinking, or to make baby formula.

Do not boil water to remove lead. Boiling water will not reduce lead.

Test your child for lead. Ask your physician or call the **LeadLine** to find out how to have your child tested for lead. A blood lead level test is the only way to know if your child is being exposed to lead.

Test your water for lead.
Contact the **LeadLine** to find out how to get a FREE lead-in-water test.

Consider using a filter.
Check whether it reduces lead—not all filters do. To protect water quality, maintain and replace a filter device in accordance with the manufacturer's instructions. For information on performance standards for water filters: **nsf.org** or **800-NSF-8010**.

Regularly clean your faucet aerator.
Particles containing lead from solder or household plumbing can become trapped in your faucet aerator. Regular cleaning or replacement every few months will remove these particles and reduce your exposure to lead.

Consider buying low-lead fixtures.
As of 2014, all pipes, fittings and fixtures are required to contain less than 0.25% lead. When buying new fixtures, you should seek out those with the lowest lead content.

PORTLAND WATER BUREAU
FROM FOREST TO FAUCET

1120 SW Fifth Avenue / Room 600
Portland, Oregon 97204

Amanda Fritz, Commissioner-in-Charge
Michael Stuhr, PE, Director

Questions? We're Here to Help

You have a range of options for contacting the Portland Water Bureau on topics from programs and projects to issues with your account and information about public meetings.

Central Information Line

8 a.m. – 5 p.m., Monday – Friday
503-823-7404
For general information about projects, programs, and public meetings.
You can also learn more on our website:
portlandoregon.gov/water

Customer Service and Financial Assistance

8 a.m. – 5 p.m., Monday – Friday
503-823-7770
PWBCustomerService@portlandoregon.gov
For questions or information about your account or to apply for financial assistance.

Water Quality Line

8:30 a.m. – 4:30 p.m., Monday – Friday
503-823-7525
WBWaterLine@portlandoregon.gov
For questions regarding water quality or water pressure.

Emergency Line

24 hours, 7 days a week
503-823-4874
For water system emergencies.

facebook.com/portlandwaterbureau
@portlandwater

Additional Drinking Water Information

Oregon Health Authority
Drinking Water Services: 971-673-0405
public.health.oregon.gov/HealthyEnvironments/DrinkingWater
Portland Water Bureau's Water System ID: 4100657

Commissioner Amanda Fritz's Office

Amanda@portlandoregon.gov
Contact Yesenia Carrillo: 503-823-3008

Regional Water Providers Consortium

The Portland Water Bureau is a member.
Find out more at **regionalh2o.org**.

Para obtener una copia del informe de calidad del agua potable en español, comuníquese con:

Здесь можно получить копию отчёта о качестве воды на русском языке:

Để có bản sao báo cáo chất lượng nước uống này bằng tiếng Việt, vui lòng liên lạc:

欲索取此饮用水报告的中文版本，请联系：

portlandoregon.gov/water/wqreport
(503) 823-7525

Please contact us for translation or interpretation, or for accommodations for people with disabilities.

More information · Más información
Дополнительная информация
Thêm thông tin · 欲了解更多信息
Mai multe informații · Macluumaad dheeri ah
Подробиці · Tichikin Poraus · अधिक सूचना

portlandoregon.gov/water/access
503-823-7525 (Relay Service: 711)

Copies of this report and past reports are available at:
portlandoregon.gov/water/wqreport

Printed on recycled paper
06/2019

2019

TRUST EVERY DROP

Your drinking water is pure & safe.

City of Lake Oswego Water Quality Report
Drinking water quality data from 2019

LOOREGON @CITYOFLAKEOSWEGO @LAKEOSWEGOINFO

TRUST EVERY DROP.
YOUR WATER IS PURE AND SAFE.

The 2019 Water Quality Report is based on data collected during the 2018 calendar year. The City prepares this report in accordance with Federal and State regulations to bring our citizens the best available information about the water they drink.

KNOW YOUR WATER:

Welcome to the City of Lake Oswego's 2019 Water Quality Report.

I am happy to report that our state-of-the-art water treatment plant and highly skilled, committed staff continue to produce and deliver the highest quality, reliable drinking water to Lake Oswego and Tigard communities. Each year, testing has demonstrated that water quality is excellent and has improved due to the new treatment system. Water system managers from around the State of Oregon have visited our treatment plant to learn about the advanced water treatment and supply system we have, and to incorporate these processes into their own utility to meet current and future water quality standards.

I am very proud to say that your tap water is safe to drink and better than ever! The City prepares this report according to Federal and State drinking water requirements to bring our citizens the best available information about the water they drink. Please review this report and find out why you can trust every drop of the drinking water that is delivered to your tap every day – all for less than a penny a gallon.

Kari Duncan
Water Supply and Treatment Manager

Sourced from the Clackamas River

Your drinking water originates in the Clackamas River watershed, which is one of the highest quality in the state.

This watershed encompasses 940 square miles and begins in the Mount Hood National Forest. Water is withdrawn from the Clackamas River, then pumped through a pipeline buried beneath the Willamette River to the Lake Oswego-Tigard Water Treatment Plant located in West Linn.

A Clackamas River Watershed Source Water Assessment was completed in 2019. The report is available at https://www.deq.state.or.us/wq/dwp/docs/uswareports/USWA_00187.00580.00591Clackamas.pdf.

The Clackamas River, your water source, is one of the highest quality in the state.

The water treatment process completed in 2017 is conventional treatment using ballasted flocculation, intermediate ozone, and biological filtration.

- **Ballasted flocculation** uses micro-sand and a coagulant to settle dirt, sediment and contaminants out of the water.
- **Ozone** is then added to remove unpleasant taste and odor compounds and to provide advanced treatment.
- **Biological Filtration** through a deep bed of granular activated carbon and silica sand removes any remaining tiny microbes and contaminants, such as cryptosporidium. Beneficial biological activity remove organic molecules that can produce disinfection byproducts.
- Once filtered, the water is **disinfected** using a small amount of chlorine and the **pH is adjusted** to prevent **corrosion** of household plumbing.

For more information on how your drinking water is treated, visit www.lotigardwater.org

YOUR LO WATER BY THE NUMBERS

Your Drinking Water Meets or Exceeds Every State and Federal Standard

Your drinking water is tested every day. More than 90 contaminants are regularly sampled, both before and after the water is treated, to ensure it meets the more than 120 water quality standards for drinking water set by the Environmental Protection Agency (EPA) and the State of Oregon.

The accompanying table shows the results of water quality testing for 2018. Every regulated substance detected in Lake Oswego's drinking water is listed. All of the substances were either not detected or were detected at levels well below limits set by the EPA and State of Oregon for safe drinking water.

For a complete listing of all test results, go to the Oregon Drinking Water Service website: https://yourwater.oregon.gov/inventory.php?pwsno=00457.

Contaminants (Units)	MCLG or MRDLG	MCL, TT, or MRDL	Your Water	Range		Sample Date	Violation	Typical Source
				Low	High			
Disinfectants & Disinfection By-Products								
Chlorine (CL^2) (ppm)	4	4	0.79 (average)	0.29	1.74	2018	No	Water additive used to control microbes
Haloacetic Acids (HAA5) (ppb)	NA	60	7.7 (highest quarterly average)	0.0	9.7	2018	No	By-product of drinking water chlorination
Total Trihalomethanes/ (TTHMs) (ppb)	NA	80	12.0 (highest quarterly average)	1.8	17.0	2018	No	By-product of drinking water disinfection
Bromate (ppb)	0	10	Not Detected (ND)	ND	1.1	2018	No	By-product of drinking water treatment with Ozone
Microbiological								
Fecal Coliform/E. Coli (positive samples)	0	0	0	Not Detected		2018	No	Human and animal waste
Total Coliform (% positive samples/ month)	0	5	0	Not Detected		2018	No	Naturally present in the environment
Turbidity (NTU)	NA	TT 0.3 in 95% of samples	100% of samples meet turbidity standards	Highest single measurement: 0.11		2018	No	Soil runoff
Inorganic Contaminants								
Copper - action level at consumer taps (ppm)	1.3	AL=1.3	90^{th} percentile: .039 Homes exceeding AL: 0			2017	No	Corrosion of household plumbing systems; erosion of natural deposits
Lead - action level at consumer taps (ppb)	0	AL=15	90^{th} percentile: 3 Homes exceeding AL: 2			2017	No	Corrosion of household plumbing systems; erosion of natural deposits
Nitrate (ppm)	ND	ND	Not Detected (ND)			2017	No	Runoff into river from fertilizer use; erosion of natural deposits
Barium (ppm)	2	2	0.004			2015	No	Erosion of natural deposits; discharge of drilling wastes; discharge from metal refineries

"Since the introduction of the new treatment process, disinfection by-products have decreased over 70%. This and other water quality parameters demonstrate that the improved treatment process has resulted in better water quality for our residents!"

— Kari Duncan, Water Supply and Treatment Manager

What Else Do We Look For In Our Water?

The following list of chemicals and compounds are what we test for on a regular basis. Most chemicals are measured in parts per billion (ppb) or parts per million (ppm).

- **Volatile Organic Compound:** (21 compounds) manmade chemical compounds such as cleaning fluids, degreasers and plastics.
- **Synthetic Organic Compounds:** (30 compounds) manmade chemicals, including insecticides and herbicides.
- **Inorganic Compounds:** (16 compounds) naturally occurring minerals and chemicals that are released into water through erosion and leaching of mineral deposits.

Cryptosporidium in Untreated Clackamas River Water

Cryptosporidium is a harmful micro-organism found in surface water throughout the U.S. Two Years of monthly Cryptosporidium monitoring of raw, untreated water was conducted from October 2016 through September 2018. Of the 24 samples collected during this sampling period, only one had detectable Cryptosporidium at 0.1 Oocyst per liter of water. Comparable with historical results, the samples from this recent testing indicate very low occurrence of Cryptosporidium. The water treatment process used includes coagulation, settling, ozonation and filtration processes optimized for Cryptosporidium removal.

Sources of Contaminants

In order to ensure that tap water is safe to drink, the EPA sets regulatory limits on the amount of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration sets limits for contaminants in bottled water which must provide the same protection for public health.

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 earth's surface or through the ground it dissolves naturally occurring minerals and, in some cases, radioactive material. Drinking water can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water throughout the United States include:

- **Microbial contaminants**, such as viruses and bacteria, which may come from wildlife or septic systems e.g. coliform and Giardia.
- **Inorganic contaminants**, such as salts and metals, which can occur naturally or result from urban stormwater runoff, industrial or domestic wastewater discharges or farming.
- **Pesticides and herbicides**, which may come from a variety of sources such as
  farming, urban stormwater runoff and home or business use.
- **Organic chemical contaminants**, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and may come from gas stations, urban stormwater runoff, and septic systems.
- **Radioactive contaminants**, which can occur naturally, e.g. radon.

Glossary: EPA Water Quality Definitions

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

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

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

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.

Nephelometric Turbidity Units (NTU): the standard unit of measurement used in water analysis to measure turbidity in a water sample. Turbidity is a measure of how clear the water looks.

Parts per Million (ppm): one part per million is equivalent to half of an aspirin tablet dissolved in a full bathtub of water (approximately 50 gallons).

Parts per Billion (ppb): one part per billion is equivalent to half of an aspirin tablet dissolved in 1,000 bathtubs of water (approximately 50,000 gallons).

pH: a scale that measures how acidic or basic drinking water (or another substance) is.

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

Frequently Asked Questions

Q: Why does my water have a chlorine taste and odor?

A: Public water systems are required by state and federal safe drinking water laws to maintain a residual chlorine level in the water to keep it safe from microbial contamination. Low levels of chlorine, below 4 ppm, are considered safe for drinking water by the EPA.

If you do not like the taste of chlorine in the water you can remove it by placing an open pitcher of water in the refrigerator to let the chlorine dissipate or run the water through an activated carbon filter that is rated to remove chlorine.

Q: Is my water hard or soft?

A: The water from the Clackamas River is considered soft. It is around 25 ppm or 1.5 grains per gallon of hardness.

Q: My water is discolored and/or tastes bad, what should I do?

A: We do not recommend that you drink the water if it is discolored, please flush the lines until the water runs clear. If it does not clear up after a few minutes of flushing, call 503-635-0280. Water taste changes may be due to a variety of factors in the home or in the water system. It is best to consult our water quality experts at the Water Treatment Plant on 503-635-0394 for advice or check our website for tips: WWW.LAKEOSWEGO.CITY/PUBLICWORKS/WATER.

Special Notice for Immuno-Compromised Persons

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly persons, 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 microbiological contaminants are available from the SAFE DRINKING WATER HOTLINE 1- 800-426-4791 or visiting WWW.EPA.GOV/SAFEWATER.

Drinking and Bottled Water Notice

Drinking water, including bottled water, may be reasonably expected to contain small amounts of some contaminants. However, the presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's SAFE DRINKING WATER HOTLINE at 1-800-426-4791.

Lake Oswego offers FREE lead testing to its water customers.

Lead Safety

Lake Oswego water system meets State and Federal requirements for Lead, results from customer sampling demonstrate that the system is optimized to prevent lead from getting into the water

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead is rarely found above detectable levels in the City of Lake Oswego's source water, the Clackamas River.

The main source of lead in drinking water is typically from household plumbing or components associated with water service lines. The City of Lake Oswego is responsible for providing high-quality drinking water, but cannot control the variety of materials used in private plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking.

Free Lead Testing

If you are concerned about lead in your water, you may wish to have your water tested. The City offers FREE lead testing to its water customers– you can pick up a test kit and instructions at the 3rd floor reception desk at City Hall.

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/SAFEWATER/LEAD.

BACKFLOW TESTING

It is once again time to think about backflow testing. Backflow assemblies separate potable water from non-potable water sources such as irrigation systems, medical equipment and private pump systems to name a few. These devices help protect the public water system from possible contamination. Backflow devices are required by the City of Lake Oswego and the State of Oregon and must be tested annually.

As of 2017, all backflows must be tested **no later than July 15th** of each calendar year. For more information and a complete list of certified backflow testers, please visit City of Lake Oswego's website at **www.lakeoswego.city/backflow** or call 503-534-5674.

OREGON HEALTH AUTHORITY
Cyanotoxin Monitoring Rule:

In 2018, the Oregon Health Authority developed a new drinking water rule that requires many drinking water systems in the state to test for cyanotoxins, and notify the public about the test results.

What are cyanotoxins?

Cyanobacteria, naturally occur in lakes and streams. Under certain conditions, such as in warm water containing an abundance of nutrients, they can rapidly form harmful algal blooms (HABs). These blooms are capable of producing toxins known as cyanotoxins. Cyanotoxins are compounds that are capable of harming humans. The Oregon Health Authority has issued safe drinking water limits for the cyanotoxins microcystins and cylindrospermopsin, listed below.

Algal Toxin	Health Advisory (Vulnerable Population)	Health Advisory (All Population)	Health Advisory (Recreational Advisory)	Sample Date	Your Water
Total Microcystins	0.3 mg/L	1.6 mg/L	4 mg/L	2018	Not Detected
Cylindrospermopsin	0.7 mg/L	3 mg/L	8 mg/L	2018	Not Detected

Is there Cyanotoxin in my drinking water?

No, there has never been any toxin detected in the Lake Oswego drinking water. The Lake Oswego Tigard Water Partnership, along with the Clackamas River Water Providers have monitored the Clackamas Watershed for many years for cyanotoxins. Although we have detected low levels of these compounds in the North Fork Reservoir and on the Clackamas, no toxin has been detected in the finished drinking water.

Can the water treatment plant remove cyanotoxins?

The answer is yes! In fact, the improved, state of the art treatment process that was completed in 2017 includes the best available technology for treatment of these compounds. Ballasted Flocculation, Ozone treatment, Biological Filtration, and final disinfection with chlorine in combination has been tested to effectively treat these compounds.

Unregulated Contaminant Monitoring Rule 2018 Results

Cyanotoxins were also tested in 2018 under the Environmental Protection Agency unregulated contaminant monitoring rule.' Finished water samples were collected and analyzed for microcystin, cylindrospermopsin and anatoxin-A from May - September 2018. No toxins were detected in any of the samples collected.

LOOKING TO SAVE MONEY ON YOUR WATER BILL?

From your kitchen to your garden, there are little things you can do to make a big difference on your bill. Get all the tips at:
www.lakeoswego.city/publicworks/water

To schedule a FREE water audit with Water Conservation Specialist Kevin McCaleb, call 503-675-3747

A Penny Per Gallon

You pay less than a penny per gallon of high-quality tap water, delivered to your home. By comparison, a 16-ounce container of bottled water costs approximately $1.00.

THANK YOU FOR TAKING THE TIME TO KNOW YOUR WATER!

WWW.LAKEOSWEGO.CITY/2019-WATER-REPORT

WIN $100 TOWARDS YOUR NEXT UTILITY BILL

To enter to win, visit **https://bit.ly/2I29TsX** then complete and submit the form by July 31, 2019

Contest Rules:

- Entrants must be a Lake Oswego water customer to win.
- Only one entry is allowed per customer.
- Entrants must complete and submit all the required information on the online form by July 31, 2019.
- One winner will be randomly selected and announced in August 2019.

MORE INFORMATION?

The City of Lake Oswego is here for you!

WWW.LAKEOSWEGO.CITY/PUBLICWORKS
Water Quality and Treatment:
503-635-0394 or
WaterTest@ci.oswego.or.us
Utility Billing: 503-635-0265
Water Operations: 503-635-0280
Water Conservation: 503-675-3747
or kmccaleb@ci.oswego.or.us

Lake Oswego Tigard Water Partnership

WWW.LOTIGARDWATER.ORG

United States Environmental Protection Agency

Safe Drinking Water Hotline
1-800-426-4791
WWW.EPA.GOV

Oregon Health Authority

Drinking Water Services
1-503-731-4010
WWW.PUBLIC.HEALTH.OREGON.GOV/HEALTHYENVIRONMENTS/DRINKINGWATER/PAGES/INDEX.ASPX

Regional Water Providers Consortium

WWW.REGIONALH2O.ORG

Clackamas River Water Providers

WWW.CLACKAMASPROVIDERS.ORG

Clackamas River Basin Council

WWW.CLACKAMASRIVER.ORG

Get Involved

Interested citizens are invited to attend Lake Oswego City Council meetings or Lake Oswego – Tigard Water Partnership Oversight Committee meetings. Visit WWW.LAKEOSWEGO.CITY/CITYCOUNCIL or WWW.LOTIGARDWATER.ORG for details.

Contact WATERTEST@CI.OSWEGO.OR.US to sign up for a public tour of the WTP offered quarterly