



*Annual*  
**WATER QUALITY**  
*Report*



Portland  
Water  
District

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As the Portland Water District’s new General Manager I am pleased to present the 2016 Annual Water Quality Report to you. Over a few very short months, I have grown impressed with the dedication of our water professionals and the caliber of their expertise. As I look through this report, many things stand out including the incredible foresight of early leaders to connect to a still impeccable source, the purity of the water as shown by comprehensive monitoring, and the transparency of the organization. At the same time - many parts of the country face challenging water concerns including supply crunches, contaminations, and enormous infrastructure investments. I know you’ve heard it before, but we are very fortunate in Greater Portland.

In this water quality report, you will find a wealth of information on the system that brings you excellent quality water that you can depend on. Raise a glass and enjoy!

*Carrie Lewis*

## IN THIS REPORT

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The Source: <i>Where does your water come from?</i>	2
Ensuring Water Quality: <i>Water Purification and Disinfection</i>	4
Water Quality Analysis	5
Water Safety and Advice: <i>Ask the water expert</i>	8
More Information	10
Steep Falls Supplemental Information	11

# THE SOURCE

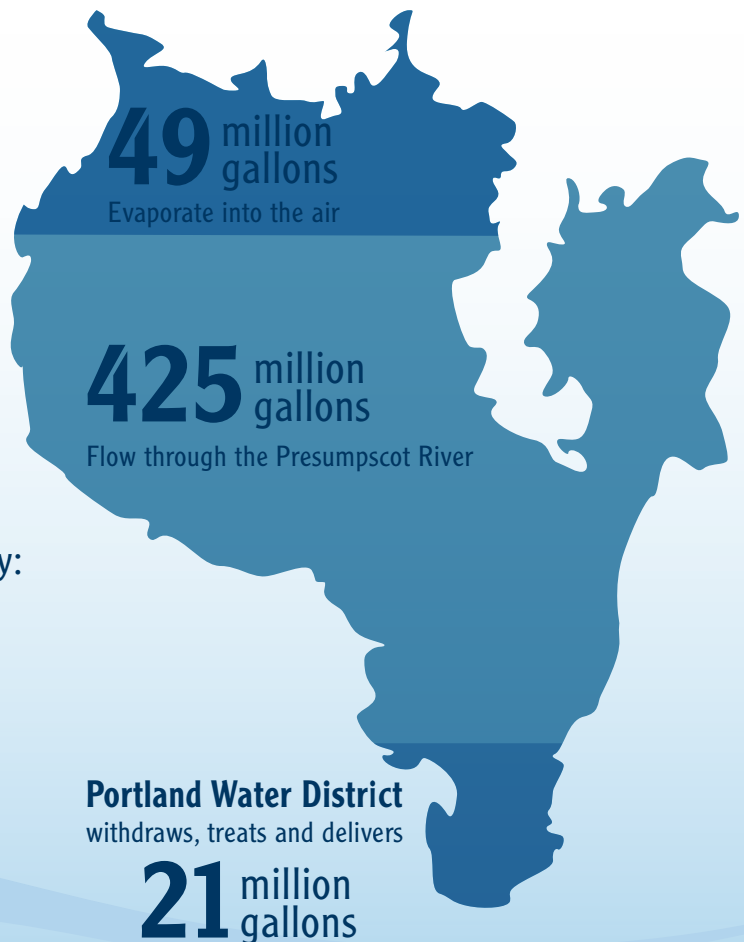
Where does your water come from?



*Your drinking water comes from Maine's second largest lake, Sebago Lake. Sebago Lake sits 16 miles north of Portland, is 12 miles long, and contains nearly 1 trillion gallons of water.*

## INTERESTING FACT

NEARLY  
**500** million  
gallons  
of water leave Sebago Lake a day:







## What makes Sebago Lake so special?

Sebago Lake is so clean that it is exempt from filtration requirements.

- It is naturally deep and cold and the soil around the lake doesn't easily erode.
- People have cared for it so well for more than a century and continue to do so.
- The land around the lake – known as the watershed – is mostly covered with forest. Forested land naturally cleans the water as it makes its way to the lake.

## Moderate Risk of Contamination

Although Sebago Lake is very clean today, human activities on and around the lake can pose a risk to water quality.

The Maine Drinking Water Program has evaluated all public water supplies as part of their Source Water Assessment Program (SWAP). The assessments reviewed geology, hydrology, land uses, water testing information, and the extent of land ownership or protection by local ordinance to see how likely drinking water sources are to being contaminated by human activities in the future. Their report on Sebago Lake concludes that the lake is at moderate risk of contamination.

The most significant risks to the long-term protection of Sebago Lake, according to state officials, are boating and ice fishing in Lower Bay and shoreland development. For more information about the SWAP, please contact the DWP at 287-2070.

## Lowering Risk of Contamination

Because the lake is used by so many for various reasons, our efforts to decrease the risk of contamination involve multiple approaches. Our protection program involves: water quality monitoring, security, inspections, direct actions, education, land acquisition, and land preservation.

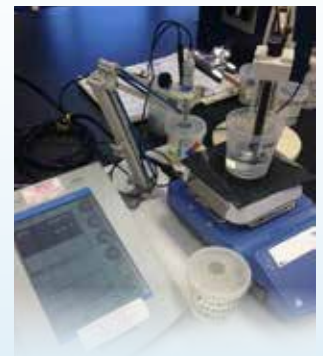
# ENSURING WATER QUALITY

## Water Purification and Disinfection

Delivering high quality water to our customers is our first priority. We know your water is safe because we regularly monitor and test it. Our water quality experts performed over 15,000 analyses last year. The vast majority of inorganic, synthetic organic, volatile organic chemicals, and disinfection by-products are routinely monitored for and are not detected.

- Primary disinfection: ozone and ultraviolet light
- Secondary disinfection: chloramine
- Filtration: None, PWD holds a waiver from filtration due to the purity of Sebago Lake.
- pH adjustment: sodium hydroxide
- Corrosion control: zinc orthophosphate
- Dental health additive: fluoride (hydrofluorosilicic acid)

In 2016, your water met or surpassed every state and federal requirement. Water samples are tested by state-certified testing laboratories including two Portland Water District laboratories which are certified by the Maine Department of Health and Human Services.



# WATER QUALITY ANALYSIS

## Detected Regulated Substances

Substance	Violation	Ideal Goal MCLG	Highest Level Allowed MCL	Amount Detected in 2016 (unless otherwise noted)	Source
<b>Microbiological</b>					
Total coliform bacteria <sup>1</sup>	No	0% of monthly samples	No more than 5% of monthly samples	Highest % detected: 0.63% in September Monthly Range: 0.0%-0.67%	Naturally present in environment
<b>Radionuclides</b>					
Alpha emitters (pCi/L)	No	0	15	2.5	Erosion of natural deposits
Uranium (µg/L)	No	0	30	0.2	Erosion of natural deposits
<b>Inorganic Chemicals</b>					
Barium (mg/L)	No	2	2	0.003	Erosion of natural deposits
Copper (mg/L) <sup>2</sup>	No	1.3	AL = 1.3	0.45	Corrosion of household plumbing systems; erosion of natural deposits
Lead (µg/L) <sup>3</sup>	No	0	AL = 15	5	Corrosion of household plumbing systems
Fluoride (mg/L)	No	4	4	Average: 0.74 Range: 0.04 - 0.90	Water additive which promotes strong teeth; erosion of natural deposits
Chloramine (mg/L)	No	MRDLG=4	MRDL=4	Average: 2.14 Range: 1.37 - 2.43	A water additive used to control microbes
Turbidity (NTU)	No	None	5	Average: 0.23 Range: 0.13 - 0.80	Soil runoff
Nitrate Nitrogen (mg/L)	No	10	10	0.08	Runoff from fertilizer use, leeching from septic tanks, or erosion of natural deposits
<b>Organic Compounds</b>					
Total Trihalomethanes, TTHM (µg/L)	No	0	80	Average: 1.09 Range: 0.60 - 2.10	By-product of drinking water chlorination
Total Haloacetic Acids, THAA (µg/L)	No	0	60	Average: 7.60 Range: 5.1 - 10.8	By-product of drinking water chlorination

### Footnotes:

<sup>1</sup> Annual detection - 1 in 1843 samples; monthly detection – September 1 in 160 samples or 0.63%

<sup>2</sup> None of the 50 homes tested in 2014 exceeded the action level for copper.

<sup>3</sup> 1 of the 50 homes tested in 2014 exceeded the action level for lead.



## Mineral Content and Secondary Standard

Substance	Maine Recommended Limit	Result	Likely Source
Chloride(mg/L)	250	9	Natural mineral, road salt
Color(PCU)	15	<5	Natural characteristic
Hardness (mg/L as CaCO <sub>3</sub> )	150	8	Natural mineral
Iron(mg/L)	0.3	<0.05	Natural mineral
Manganese(mg/L)	0.05	<0.005	Natural mineral
Sodium(mg/L)	100	8	Natural mineral, road salt
Sulfate(mg/L)	250	3	Naturally occurring
Magnesium(mg/L)	50	0.6	Natural mineral
Calcium(mg/L)	500	2.5	Natural mineral
Zinc(mg/L)	5	0.1	Natural mineral, corrosion control additive

## Detected Unregulated Substances Ongoing Research For New Regulations

Substance	Violation	Health Advisory, µg/L	Range of Results (Detected in year noted)	Source
Chlorate, µg/L (2013)	No	No EPA health data	Average: 90 Range: 64 - 140	Agricultural defoliant or desiccant; used in the production of chlorine dioxide
Chromium, Total, µg/L (2013)	No	No EPA health data	Average: 0.29 Range: 0.27 - 0.31	Erosion of natural deposits
Hexavalent Chromium, Dissolved, µg/L (2013)	No	No EPA health data	Average: 0.057 Range: 0.037 - 0.110	Naturally occurring element; used in making steel and other alloys
Strontium, µg/L (2013)	No	No EPA health data	Average: 21 Range: 20 - 23	Erosion of natural deposits

Unregulated Substances are those that do not yet have a drinking water standard set by the USEPA. The purpose of monitoring for these contaminants is to help EPA decide whether or not they should have a standard.

As part of this 2013 monitoring, the Portland Water District tested for several additional unregulated contaminants; all without detection. This included hormones such as testosterone and estradiol that are produced in the human body and used in pharmaceuticals.

# WATER QUALITY ANALYSIS

**MCL:** Maximum Contaminant Level. The highest level of a contaminant that is allowed in drinking water.

**MCLG:** Maximum Contaminant Level Goal. The level of a contaminant in drinking water below which there is no known or expected risk to health.

**MRDL:** Maximum Residual Disinfectant Level. The highest level of a disinfectant allowed in drinking water.

**MRDLG:** Maximum Residual Disinfection 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.

**LRAA:** Locational Running Annual Average. A 12 month rolling average of all monthly or quarterly samples at specific sampling locations. Calculation of the LRAA may contain data from the previous year.

**Variations and Exemptions:** State permission not to meet MCL or a treatment technique under certain conditions.

**AL = Action Level:** The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow. Action Levels for Lead and Copper are measured at the tap of “high risk” homes. Ninety percent of tests must be equal to or below the Action Level.

**ppb:** one part per billion.

**ppm:** one part per million.

**mg/L:** milligrams per liter, or parts per million.

**µg/L:** micrograms per liter, or parts per billion

**Turbidity:** The measurement of cloudiness or suspended colloidal matter (silt). As you can see from the table, all of the samples taken of our water system were well below 5 NTUs.

**NTU**=Nephelometric Turbidity Units

## Notes:

**Fluoride:** Fluoride levels must be maintained between 0.5 to 1.2 ppm. The optimum level is 0.7 ppm.

**Lead/Copper:** Action levels (AL) are measured at consumer’s tap. 90% of the tests must be equal to or below the action level. If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Portland Water District is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at: <http://www.epa.gov/safewater/lead>

**TTHM/HAA5:** Total Trihalomethanes and Haloacetic Acids (TTHM and HAA5) are formed as a by-product of drinking water chlorination. This chemical reaction occurs when chlorine combines with naturally occurring organic matter in water. Compliance is based on locational running annual average.

**Nitrate:** Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant you should ask advice from your health provider.

## About the Regulations

The federal Safe Drinking Water Act directs the state, along with the EPA, to establish and enforce drinking water standards. The standards set limits on certain biological, radioactive, organic and inorganic substances sometimes found in drinking water. Two types of standards have been established. Primary drinking water standards set achievable levels of drinking water quality to protect your health. Secondary drinking water standards provide guidelines regarding the taste, odor, color, and other aesthetic aspects of your drinking water, which do not present a health risk.



# WATER SAFETY AND ADVICE

Ask the Water Expert



## Lead in Schools: What's all the buzz about?

Early last year, news of a drinking water contamination in Flint, MI, placed lead front and center as a drinking water contaminant of concern. It didn't take long for attention to focus on schools since children are most susceptible to lead exposure because their bodies are still developing. An estimated 50 million children attend school each day and spend a considerable amount of time there. Schools that receive water from a public water supplier, like the Portland Water District, are not legally required to test for lead since the public water supplier conducts lead sampling and is required to provide water that meets lead limits. This ensures the water is optimized in the system, but it does not ensure the internal plumbing system in the school is safe. Recently both the Portland Water District and the State of Maine offered free lead testing to all schools in our service area and many schools took advantage of the offer. All school samples that PWD processed came back favorable. Testing drinking water taps and fountains in schools on a recurring basis and correcting problems as encountered are significant actions that protect the health of our school-age children. Schools can continue to minimize student exposure to lead in drinking water by identifying potential sources of elevated lead, testing drinking water, and informing the public about monitoring, potential risks, testing results, and remediation actions. For guidance on reducing lead in drinking water at schools, visit our web site at [www.pwd.org/faqs/there-lead-my-water](http://www.pwd.org/faqs/there-lead-my-water).





## Why do water utilities issue boil water orders?

The Portland Water District invests millions of dollars each year to replace old water pipes and upgrade infrastructure, but unfortunately water mains still break. This presents a potential pathway for contaminants to enter the drinking water system. Fortunately, there are ways to limit this from happening. When a break in a pipe occurs, water pressure inside the pipe pushes water out and prevents contaminants from entering. Also, during the repair process additional precautions are used such as disinfecting tools and equipment, trench control, and thoroughly flushing pipes after repairs are made. When used together, these steps keep the water safe and protect your health. In rare cases a large water main break can result in negative water pressure in the pipe which increases the risk of contamination. It is in these situations that the Portland Water District may issue a “Boil Water Order.”

## Important things to know about a Boil Water Order (BWO)

- BWOs are almost always PRECAUTIONARY. To date, all PWD BWOs have been precautionary and put in place because the risk of contamination is heightened.
- Normal water main breaks can be repaired under pressure and do not require a boil water order.
- BWOs recommend boiling your water at a rolling boil for 1 minute before using it for drinking, brushing teeth or cooking.
- You can safely shower, clean, do laundry or water plants without boiling the water, as long as you are not ingesting the water.
- Once the repair is complete PWD will test the water for bacteria at multiple locations to make sure the water is safe. Test results are generally available 18-24 hours after the water main is repaired. If the bacteria test passes, the BWO is lifted.
- During boil order alerts, the Portland Water District notifies customers through multiple channels including our web site, social media and the CodeRED emergency alert system. To make sure CodeRED has your correct information, sign in and verify your contact number and designate your preferred method of notice. ([www.cumberlandcounty.org/130/Regional-Communications-Center](http://www.cumberlandcounty.org/130/Regional-Communications-Center))



## Health Advisories

Drinking water, including bottled water, may reasonably be expected to contain impurities or contaminants. However, these contaminants do not necessarily indicate that water poses a health risk and may 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 can also come from gas stations, urban runoff, and septic systems.
- **Radioactive Contaminants**, which can be naturally-occurring or be the result of oil and gas production and mining activities.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised people such as individuals with cancer undergoing chemotherapy, people 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. Guidelines, jointly developed by the EPA and the CDC, on the appropriate means to lessen the risk of infection by *Cryptosporidium*, are available from the Safe Drinking Water Hotline (1-800-426-4791) or web site.

## More Information

The Portland Water District Board of Trustees generally meet every second and fourth Monday of the month. The public is welcome to attend meetings.

**207.761.8310**

(Monday through Friday between 8:00 a.m. and 4:30 p.m.)

225 Douglass Street | PO Box 3553 | Portland, Maine 04102

www.pwd.org | Customerservice@pwd.org | MyPortlandWater  

Environmental Protection Agency  
800.426.4791 | www.epa.gov/safewater/

American Water Works Association  
303.794.7711 | www.awwa.org

National Centers for Disease Control  
404.639.3311 | www.cdc.gov

Maine Drinking Water Program  
207.287.2070 | www.maine.gov





# SUPPLEMENTAL INFORMATION

## Steep Falls, Standish

*Because the Steep Falls water system is separate from the Greater Portland water system, some components of the Water Quality Report do not apply to your system. Those sections have been modified and provided below.*

### Your Source of Water and Ensuring Water Quality

The Steep Falls well system (Standish) supplies approximately 300 people. Treatment includes liquid sodium hypochlorite addition for disinfection, sodium hydroxide addition for pH adjustment and corrosion control, aeration for radon removal, and fluoridation (sodium fluoride).

In 2014 the Maine Drinking Water Program granted the Steep Falls System a “Synthetic Organics Waiver” from sampling and reporting requirements for toxaphene/chlordane/PCB, herbicides, carbamate pesticides, and semi-volatile organics. This waiver was granted due to the absence of these potential sources of contamination within a half mile radius of the water source. Other testing for inorganic and volatile organic compounds continues at the required frequency.

### Water Quality Report (Detected Regulated Substances)

Substance	Ideal Goal MCLG	Highest Level Allowed MCL	Amount Detected in 2016 (unless otherwise noted)	Violation	Source
<b>Radionuclides</b>					
Alpha emitters (pCi/L) 2015	0	15	5.0	No	Erosion of natural deposits
Radium, Combined (pCi/L) 2015	0	5	0.7	No	Erosion of natural deposits
Radium-226 (pCi/L) 2015	0	5	0.7	No	Erosion of natural deposits
Radium-228 (pCi/L) 2015	0	5	0.6	No	Erosion of natural deposits
Radon (pCi/L)	4000	4000	1679	No	Erosion of natural deposits
Uranium (µg/L) 2014	0	30	4	No	Erosion of natural deposits
<b>Organic Compounds</b>					
Total Trihalomethanes (µg/L)	0	80	5.7	No	By-product of chlorination
<b>Inorganic Compounds</b>					
Barium (mg/L) 2014	2	2	0.007	No	Erosion of natural deposits; discharge of drilling waste and metal refineries
Chromium (µg/L) 2014	100	100	1	No	Erosion of natural deposits; dis- charge from steel and pulp mills
Chlorine (mg/L)	MRDL=4	MRDL=4	Average: 1.20 Range: 0.92 - 1.73	No	A water additive used to control microbes
Fluoride (mg/L)	4	4	Average: 0.7 Range: 0.54 - 0.89	No	Water additive which promotes strong teeth. Erosion of natural deposits
Nitrate - Nitrogen (mg/L)	10	10	1.2	No	Fertilizer runoff; leaching septic tanks; erosion of natural deposits

**Definitions:** Look to page 7 for definitions. pCi/L: picocuries per liter (a measure of radioactivity)

**Notes:** Radon at a level of 1679 pCi/L was detected in Steep Falls' well water after aeration treatment. Radon is found in the soil and bedrock formations and is a water soluble, gaseous by-product of uranium. Most radon is released to the air moments after turning on the tap. Only about 1-2 percent of radon in the air comes from drinking water. Inhalation of radon increases the risk of lung cancer over the course of your lifetime.

If you'd like more information about radon, please contact us or the State Drinking Water Program and request a radon fact sheet.