



Supplemental Water Quality Data: November 2024

About Portland's Water

Portland uses surface water from the Bull Run Watershed as its primary source year-round. Groundwater from the Columbia South Shore Well Field is an important secondary source, which is used when the surface water supply is limited or temporarily unavailable. The groundwater system is typically operated annually for several weeks in mid-late summer in a blending mode with surface water to ensure all equipment is in good working order, and potentially longer if supply conditions indicate the need to augment the surface water supply in late summer-early fall. In 2024, groundwater maintenance operations began on August 1 and ended on August 20. During this time, wells were operated up to 12 hours per day, Monday through Friday only, and approximately 235 million gallons of groundwater were produced for supply at flow rates ranging up to a maximum of 45 million gallons per day, providing approximately 8.4 percent of PWB's total daily water supply. Also in 2024, groundwater was operated for seasonal supply augmentation from October 10 to November 6. During this time, wells were operated 24/7, and approximately 824 MG of groundwater were produced for supply at flow rates averaging 30.4 MGD, providing approximately 37 percent of PWB's total daily supply. More information is available on our [About Portland's Water System page](#). Dates that groundwater has been used in the past are listed on our [Groundwater Use page](#).

Surface water treatment is a three-step process which currently consists of:

1. **Chlorine (Cl₂)** is added as a disinfectant to inactivate microorganisms such as bacteria, *Giardia*, and viruses, which could otherwise make people sick. The target chlorine level for finished water at the entry point to the distribution system varies seasonally, ranging between 2.2 and 2.5 parts per million (ppm).
2. **Ammonia (NH₃)** is added to stabilize the chlorine and form a longer-lasting chloramine disinfectant in the distribution system piping. Total ammonia averages about 0.5 ppm and free ammonia about 0.02 ppm as N.
3. **Soda ash (Na₂CO₃) and carbon dioxide (CO₂)** are added for corrosion control. This increases the pH and the total alkalinity of finished water, which is intended to reduce leaching of metals from piping materials. Currently, the targets for pH and total alkalinity in finished surface water at the entry point to the distribution system are 8.8 pH units and 30 ppm alkalinity as CaCO₃, respectively.

Groundwater is also treated by chloramination (chlorine plus ammonia), but pH adjustment for groundwater is achieved using sodium hydroxide (NaOH) rather than soda ash and carbon dioxide. The pH target for finished groundwater at the entry point to the distribution system is 8.2 pH units. Groundwater has naturally higher alkalinity than surface water and alkalinity adjustment is not necessary for groundwater.

The Portland Water Bureau is currently working on designing and constructing a new filtration plant for the Bull Run surface water supply. Find out more on our [Bull Run Projects page](#).

About This Report

The Portland Water Bureau releases drinking water test results three times per year for users who need water quality data beyond what is provided in our [annual water quality report](#). Data in this report includes the most recent test results from both water sources, the surface water source in the Bull Run Watershed and the groundwater source in the Columbia South Shore Well Field.

Bull Run samples are collected at the Lusted Hill Treatment Facility outlet, which is the surface water entry point to the distribution system. In addition to daily process control sampling, this location is typically sampled three times per year in April, August, and November. The data tables below contain results from the most recent sampling event on **November 5, 2024**, as well as the range of results for the past 12 months (Dec. 1, 2023, through Nov. 30, 2024).

Groundwater samples are collected at the Groundwater Pump Station outlet, which is the groundwater entry point to the distribution system. In addition to daily process control sampling, this location is typically sampled only once per year in August unless more extensive use of groundwater occurs during the year. The data tables below contain results from the most recent sampling events on **August 14, 2024**, and October 28, 2024 (VOCs only) as well as the range of results from the past 3 years (Dec. 1, 2021, through Nov. 30, 2024).

Find this data and additional test results on our [Drinking Water Test Results page](#).

Have questions about water quality or this report? Contact our Water Quality Line at or 503-823-7525 or WBWaterLine@portlandoregon.gov.

Have feedback on this report or want to be added to our email distribution list? Email Randy Albright at randy.albright@portlandoregon.gov.

A list of definitions and abbreviations can be found after the data tables.

Data for Treated Bull Run Water

Physical Characteristics

Physical characteristics include temperature, pH, specific conductance, hardness, color, turbidity, and solids.

| Physical characteristic | 11/5/24 results | 12-month range | Standard limit | Standard type | Units |
|------------------------------------|-----------------|----------------|----------------|---------------------|---|
| Color | 9 | 5 – 9 | 15 | Secondary | Color Units |
| Hardness (as CaCO ₃) | 11 | 6.5 – 11 | 250 | Secondary (Oregon) | ppm |
| Hardness (in grains per US gallon) | 0.64 | 0.38 – 0.64 | - | None in these units | Grains per US gallon (1 grain = 17.1 ppm) |
| pH, Field | 8.8 | 8.5 – 9.1 | 6.5 – 8.5 | Secondary | Standard pH Units |
| Specific Conductance | 72.4 | 62.9 – 72.4 | - | None | µmhos/cm @25°C |
| Temperature | 12.7 | 3.0 – 17.8 | - | None | degrees Celsius |
| Total Dissolved Solids (TDS) | 52 | 46 – 52 | 500 | Secondary | ppm |
| Total Suspended Solids (TSS) | <0.5 | <0.5 – 2.0 | - | None | ppm |
| Total Solids (TS @180°C) | 54 | 47 – 54 | - | None | ppm |
| Turbidity | 0.59 | 0.06 – 4.42 | 5 | Other – see notes | Nephelometric Turbidity Units (NTU) |

Nutrients

Nutrients are naturally occurring organic and inorganic substances that microorganisms and plants need to grow.

| Nutrient (chemical compound) | 11/5/24 results | 12-month range | Standard limit | Standard type | Units |
|---|-----------------|----------------|----------------|---------------|-------|
| Ammonia Nitrogen, Free (NH ₃ as N) | 0.043 | <0.01 – 0.068 | - | None | ppm |
| Ammonia Nitrogen, Total (NH ₃ as N) | 0.52 | 0.35 – 0.57 | - | None | ppm |
| Nitrate Nitrogen (NO ₃ ⁻ as N) | 0.084 | <0.010 – 0.084 | 10 | Primary | ppm |
| Nitrite Nitrogen (NO ₂ ⁻ as N) | <0.005 | <0.005 | 1 | Primary | ppm |
| Nitrogen, Organic (N) | <0.05 | <0.05 | - | None | ppm |
| Nitrogen, Total (N) | 0.52 | 0.36 – 0.52 | - | None | ppm |
| Phosphorus, Reactive (PO ₄ ³⁻ as P) | 0.004 | 0.004 | - | None | ppm |
| Phosphorus, Total (P) | 0.04 | <0.01 – 0.04 | - | None | ppm |
| Silica (SiO ₂ as Si) | 5.4 | 3.9 – 5.4 | - | None | ppm |
| Total Organic Carbon (TOC as C) | 1.5 | 0.88 – 1.5 | - | None | ppm |

Anions and Cations

Anions (negatively charged ions) and cations (positively charged ions) enter the water when it flows over or through soil and rocks, dissolving minerals into the water.

| Anions and cations (chemical compound) | 11/5/24 results | 12-month range | Standard limit | Standard type | Units |
|---|-----------------|----------------|----------------|---------------------|-------|
| Alkalinity, Bicarbonate (HCO ₃ ⁻ as CaCO ₃) | 29 | 27 – 30 | - | None | ppm |
| Alkalinity, Carbonate (CO ₃ ²⁻ as CaCO ₃) | 0.7 | 0.5 – 0.7 | - | None | ppm |
| Alkalinity, Hydroxide (OH ⁻ as CaCO ₃) | 0.1 | <0.1 – 0.1 | - | None | ppm |
| Alkalinity, Total (as CaCO ₃) | 30 | 26 - 33 | - | None | ppm |
| Calcium (Ca ²⁺) | 2.4 | 1.6 – 2.4 | - | None | ppm |
| Carbon Dioxide, Free (CO ₂) | 0.23 | 0.23 – 0.28 | - | None | ppm |
| Carbon Dioxide, Total (CO ₂) | 26 | 25 – 27 | - | None | ppm |
| Chloride (Cl ⁻) | 3.6 | 2.9 – 3.6 | 250 | Secondary | ppm |
| Cyanide (CN ⁻) | Not tested | <0.005 | 0.2 | Primary | ppm |
| Fluoride (F ⁻) | <0.025 | <0.025 | 4.0 / 2.0 | Primary / Secondary | ppm |
| Magnesium (Mg ²⁺) | 1.2 | 0.63 – 1.2 | - | None | ppm |
| Potassium (K ⁺) | 0.29 | 0.18 – 0.29 | - | None | ppm |
| Sodium (Na ⁺) | 12 | 11 – 13 | - | None | ppm |
| Sulfate (SO ₄ ²⁻) | 0.36 | 0.36 – 0.40 | 250 | Secondary | ppm |

Metals

Metals are a group of similar elements that occur naturally in the Earth's crust. The following results are for the total metal concentration in treated water. Note that lead and copper are regulated at the customer tap; see the [Annual Water Quality report](#) for regulatory data for customer taps.

| Metal (atomic symbol) | 11/5/24 results | 12-month range | Standard limit | Standard type | Units |
|-----------------------|-----------------|--------------------|----------------|-------------------|-------|
| Aluminum (Al) | 0.02120 | 0.02120 – 0.02730 | 0.05 – 0.2 | Secondary | ppm |
| Antimony (Sb) | <0.00050 | <0.00050 | 0.006 | Primary | ppm |
| Arsenic (As) | <0.00050 | <0.00050 | 0.010 | Primary | ppm |
| Barium (Ba) | 0.00118 | 0.00076 – 0.00118 | 2 | Primary | ppm |
| Beryllium (Be) | <0.00050 | <0.00050 | 0.004 | Primary | ppm |
| Cadmium (Cd) | <0.00050 | <0.00050 | 0.005 | Primary | ppm |
| Chromium (Cr) | <0.00050 | <0.00050 | 0.1 | Primary | ppm |
| Copper (Cu) | <0.00050 | <0.00050 – 0.00182 | 1.3 | Other – see notes | ppm |
| Iron (Fe) | 0.1410 | 0.0186 – 0.1410 | 0.3 | Secondary | ppm |
| Lead (Pb) | <0.00005 | <0.00005 | 0.015 | Other – see notes | ppm |
| Manganese (Mn) | 0.01830 | 0.00248 – 0.01830 | 0.05 | Secondary | ppm |
| Mercury (Hg) | <0.00010 | <0.00010 | 0.002 | Primary | ppm |
| Nickel (Ni) | <0.00050 | <0.00050 | - | None | ppm |
| Selenium (Se) | <0.0025 | <0.0025 | 0.05 | Primary | ppm |
| Silver (Ag) | <0.00050 | <0.00050 | 0.1 | Secondary | ppm |
| Thallium (Tl) | <0.00050 | <0.00050 | 0.002 | Primary | ppm |
| Zinc (Zn) | <0.0020 | <0.0020 | 5 | Secondary | ppm |

Volatile Organic Chemicals (VOCs)

Volatile Organic Chemicals (VOCs) include solvents, disinfection by-products, and industrial and commercial products. The test measures the concentration of 60 individual VOCs. Of those, Portland commonly detects only bromodichloromethane and chloroform in treated surface water. These two VOCs are part of a group of VOCs called trihalomethanes. Trihalomethanes are disinfection by-products, which form when naturally occurring organic and inorganic materials in the water react with chlorine or other disinfectants.

| Volatile Organic Chemical | 11/12/24 results | 12-month range | Standard limit | Standard type | Units |
|--|------------------|-------------------|---------------------|---------------------------|-------|
| Bromodichloromethane | 0.00140 | 0.00055 – 0.00140 | 0.080 | Other – see notes | ppm |
| Chloroform | 0.02080 | 0.01040 – 0.02080 | 0.080 | Other – see notes | ppm |
| 58 additional Volatile Organic Chemicals | Not Tested | All <MRL | Depends on Compound | 21 – Primary 37 – None | ppm |

Data for Treated Groundwater

Physical Characteristics

Physical characteristics include temperature, pH, specific conductance, hardness, color, turbidity, and solids.

| Physical characteristic | 8/14/24 results | 3-year range | Standard limit | Standard type | Units |
|------------------------------------|-----------------|--------------|----------------|---------------------|---|
| Color | 7 | <5 – 7 | 15 | Secondary | Color Units |
| Hardness (as CaCO ₃) | 78 | 50 – 92 | 250 | Secondary (Oregon) | ppm |
| Hardness (in grains per US gallon) | 4.6 | 2.9 – 5.4 | - | None in these units | Grains per US gallon (1 grain = 17.1 ppm) |
| pH, Field | 7.7 | 7.7 – 8.5 | 6.5 – 8.5 | Secondary | Standard pH Units |
| Specific Conductance | 180 | 150 – 237 | - | None | µmhos/cm @25°C |
| Temperature | 16.6 | 9.4 – 19.3 | - | None | degrees Celsius |
| Total Dissolved Solids (TDS) | 140 | 130 – 150 | 500 | Secondary | ppm |
| Total Suspended Solids (TSS) | 1.5 | <0.5 – 1.5 | - | None | ppm |
| Total Solids (TS @180°C) | 150 | 130 – 160 | - | None | ppm |
| Turbidity | 0.45 | <0.05 – 2.4 | - | see notes | Nephelometric Turbidity Units (NTU) |

Nutrients

Nutrients are naturally occurring organic and inorganic substances that microorganisms and plants need to grow.

| Nutrient (chemical compound) | 8/14/24 results | 3-year range | Standard limit | Standard type | Units |
|---|-----------------|----------------|----------------|---------------|-------|
| Ammonia Nitrogen, Free (NH ₃ as N) | 0.019 | <0.01 – 0.26 | - | None | ppm |
| Ammonia Nitrogen, Total (NH ₃ as N) | 0.47 | 0.37 – 0.56 | - | None | ppm |
| Nitrate Nitrogen (NO ₃ ⁻ as N) | 0.31 | 0.048 – 0.31 | 10 | Primary | ppm |
| Nitrite Nitrogen (NO ₂ ⁻ as N) | <0.005 | <0.005 – 0.005 | 1 | Primary | ppm |
| Phosphorus, Reactive (PO ₄ ³⁻ as P) | 0.12 | 0.10 – 0.13 | - | None | ppm |
| Phosphorus, Total (P) | 0.11 | 0.09 – 0.12 | - | None | ppm |
| Silica (SiO ₂ as Si) | 20.1 | 16.8 – 20.1 | - | None | ppm |
| Total Organic Carbon (TOC as C) | <0.30 | <0.30 – 0.62 | - | None | ppm |

Anions and Cations

Anions (negatively charged ions) and cations (positively charged ions) enter the water when it flows over or through soil and rocks, dissolving minerals into the water.

| Anions and cations (chemical compound) | 8/14/24 results | 3-year range | Standard limit | Standard type | Units |
|---|-----------------|--------------|----------------|---------------------|-------|
| Alkalinity, Bicarbonate (HCO ₃ ⁻ as CaCO ₃) | 89 | 77 - 100 | - | None | ppm |
| Alkalinity, Carbonate (CO ₃ ²⁻ as CaCO ₃) | 0.7 | 0.7 – 1.5 | - | None | ppm |
| Alkalinity, Hydroxide (OH ⁻ as CaCO ₃) | <0.1 | <0.1 | - | None | ppm |
| Alkalinity, Total (as CaCO ₃) | 90 | 79 – 115 | - | None | ppm |
| Calcium (Ca ²⁺) | 18 | 14 – 18 | - | None | ppm |
| Chloride (Cl ⁻) | 4.0 | 2.5 – 4.1 | 250 | Secondary | ppm |
| Cyanide (CN ⁻) | <0.0050 | <0.0050 | 0.2 | Primary | ppm |
| Fluoride (F ⁻) | 0.09 | 0.09 – 0.15 | 4.0 / 2.0 | Primary / Secondary | ppm |
| Magnesium (Mg ²⁺) | 8.1 | 6.5 – 8.1 | - | None | ppm |
| Potassium (K ⁺) | 2.6 | 2.4 – 2.6 | - | None | ppm |
| Sodium (Na ⁺) | 12 | 11 - 15 | - | None | ppm |
| Sulfate (SO ₄ ²⁻) | 5.6 | 3.8 – 5.6 | 250 | Secondary | ppm |

Metals

Metals are a group of similar elements that occur naturally in the earth's crust. The following results are for the total metal concentration in treated water. Note that lead and copper are regulated at the customer tap; see the [Annual Water Quality report](#) for regulatory data for customer taps.

| Metal (atomic symbol) | 8/14/24 results | 3-year range | Standard limit | Standard type | Units |
|-----------------------|-----------------|--------------------|----------------|-------------------|-------|
| Aluminum (Al) | 0.00892 | 0.00247 – 0.00892 | 0.05 – 0.2 | Secondary | ppm |
| Antimony (Sb) | <0.00050 | <0.00050 | 0.006 | Primary | ppm |
| Arsenic (As) | 0.00110 | <0.00050 – 0.00110 | 0.010 | Primary | ppm |
| Barium (Ba) | 0.01040 | 0.00818 – 0.01070 | 2 | Primary | ppm |
| Beryllium (Be) | <0.00050 | <0.00050 | 0.004 | Primary | ppm |
| Cadmium (Cd) | <0.00050 | <0.00050 | 0.005 | Primary | ppm |
| Chromium (Cr) | <0.00050 | <0.00050 | 0.1 | Primary | ppm |
| Copper (Cu) | 0.00054 | <0.00050 – 0.00054 | 1.3 | Other – see notes | ppm |
| Iron (Fe) | 0.0670 | 0.0056 – 0.0670 | 0.3 | Secondary | ppm |
| Lead (Pb) | <0.00005 | <0.00005 | 0.015 | Other – see notes | ppm |
| Manganese (Mn) | 0.02690 | 0.00712 – 0.03520 | 0.05 | Secondary | ppm |
| Mercury (Hg) | <0.00010 | <0.00010 | 0.002 | Primary | ppm |
| Nickel (Ni) | <0.00050 | <0.00050 | - | None | ppm |
| Selenium (Se) | <0.0025 | <0.0025 | 0.05 | Primary | ppm |
| Silver (Ag) | <0.00050 | <0.00050 | 0.1 | Secondary | ppm |
| Thallium (Tl) | <0.00050 | <0.00050 | 0.002 | Primary | ppm |
| Vanadium (V) | 0.00277 | 0.00184 – 0.00396 | - | None | ppm |
| Zinc (Zn) | <0.0020 | <0.0020 | 5 | Secondary | ppm |

Volatile Organic Chemicals (VOCs)

Volatile Organic Chemicals (VOCs) include solvents, disinfection by-products, and industrial and commercial products. The test measures the concentration of 60 individual VOCs. Of those, Portland only infrequently detects chloroform and bromodichloromethane in treated groundwater. Chloroform and bromodichloromethane are part of a group of VOCs called trihalomethanes. Trihalomethanes are disinfection by-products and form when naturally occurring organic and inorganic materials in the water react with chlorine or other disinfectants.

| Volatile Organic Chemical | 10/28/24 results | 3-year range | Standard limit | Standard type | Units |
|--|------------------|--------------------|---------------------|---------------------------|-------|
| Bromodichloromethane | <0.00050 | <0.00050 – 0.00050 | 0.080 | Other – see notes | ppm |
| Chloroform | 0.00068 | <0.00050 – 0.00068 | 0.080 | Other – see notes | ppm |
| 58 additional Volatile Organic Chemicals | All <MRL | All <MRL | Depends on Compound | 21 – Primary 37 – None | ppm |

Notes

Drinking Water Standards

Regulatory standards (or limits) for substances in drinking water are set by the United States Environmental Protection Agency (EPA) and the State of Oregon Health Authority (OHA). Naturally occurring or anthropogenic substances that have an established drinking water standard based on health risk or aesthetic characteristics are called regulated contaminants. Unregulated substances do not have a drinking water standard, but the EPA may consider setting a standard for them in the future.

There are four types of standards referred to in this report:

- **Primary** standards are set for contaminants that have potential health effects. These standards are usually given as Maximum Contaminant Levels (MCLs) intended to protect public health. Water systems are required to test for most substances with primary standards at the entry point to the distribution system and report any detections in their annual water quality report. Exceptions to the compliance location for primary standards are listed below under 'Other'.
- **Secondary** standards are set for contaminants that can have aesthetic water quality impact. These are not generally considered harmful to health at low concentrations. These standards are given as Secondary Maximum Contaminant Levels (SMCLs). The secondary standards apply to substances that may affect water taste, odor, or color; may stain sinks, bathtubs, or laundry; or may interfere with treatment processes. Water systems are not required to test for these substances but can use the SMCLs as guidance for aesthetic considerations.
- **Other:** Compliance with primary drinking water standards for turbidity, lead and copper, and trihalomethane VOCs are determined at different points in the water system.
 - Turbidity in unfiltered surface water or groundwater under the direct influence of surface water is regulated at the raw water intake rather than at the entry point to the distribution system. PWB's groundwater system has not been determined to be under the direct influence of surface water, and therefore no turbidity standards apply to the groundwater system.
 - Lead and copper are regulated at customer taps, rather than at the entry point to the distribution system.
 - Trihalomethane VOCs are regulated as the sum of results for a group of four trihalomethane compounds (Total Trihalomethanes), in the distribution system rather than at the entry point to the distribution system.
- **None:** Not all substances found in water have a regulatory standard. Water systems are not required to test for unregulated substances. Portland provides data for these substances in this report since their presence in water may impact some users.

Definitions and Abbreviations Used in Data Tables

Method Reporting Limit (MRL)

The method reporting limit (MRL) is the lowest concentration of a substance that can be reliably reported for the test method. In the data tables, substances that had results below the MRL have a less than symbol (<) in front of the numerical MRL. MRL is equivalent to Limit of Quantitation (LOQ).

Parts per Million (ppm)

Water providers use ppm to describe a small amount of a substance in water. In time measurement, one part per million is about 32 seconds out of one year. Parts per million (ppm) is generally equivalent to milligrams per liter (mg/L).