

# 2021 Drinking Water Quality Report



**PHILADELPHIA  
WATER**  
DEPARTMENT

*Published in 2022*

**NOTE:** Industrial and commercial customers, including hospitals, medical centers and health clinics, please forward this report to your Environmental Compliance Manager.

*This report is produced for you as a requirement of the Federal Safe Drinking Water Act.*

PWD's Public Water System Identification  
#PA1510001

# Your tap is locally sourced.

Water from our rivers is treated to the highest standards.



# A message from the Commissioner



## Philadelphia Is Investing in Clean Water

This year's Drinking Water Quality Report is a testament to the fact that we are continuing to meet our mission of providing 1.6 million people with some of the best water in the country.

Delivering hundreds of millions of gallons of safe, clean water every day—and ensuring all of our services are affordable—doesn't happen by accident.

The maintenance and improvements we have planned require major work and investment, and we are actively securing funds that allow us to make critical investments and reduce costs for our customers.

For example, we recently received a \$40.4 million loan for water main replacement from the state-run Pennsylvania Infrastructure Investment Authority, PENNVEST.

An additional \$125 million loan will go toward building new basins at our Baxter Drinking Water Treatment Plant, helping to ensure reliable clean water now and in the future.

Our Torresdale Filtered Water Pumping Station was awarded an \$80.8 million loan to fund what amounts to its biggest makeover since it was constructed more than 70 years ago.

We are also currently planning improvements that will essentially rebuild our Queen Lane Drinking Water Treatment Plant in the coming years.

All of these investments will result in direct health and safety benefits for the people of Philadelphia.

Our strong record of planning for big investments will pay off as cities and states begin to access resources made available by the Bipartisan Infrastructure Law passed in 2021.

While it is still unclear how much Philadelphia will receive from Pennsylvania's share of the funds, this is the opportunity of a generation. We look forward to the support of local stakeholders and officials.

Thanks to our team of dedicated staff, Philadelphia is poised to take advantage of this historic moment to further invest in the health and sustainability of our city.

**Learn more about our plans to invest in clean drinking water:** see page 11 to read about the 25-year Water Revitalization Plan.

Sincerely,

**Randy E. Hayman, Esq.**  
Water Commissioner

## Contact Information

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View this report online:  
[water.phila.gov/2021-quality](https://water.phila.gov/2021-quality)

### Sharing this report

Please share this report with all people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools and businesses). You can do this by posting this notice in a public place or distributing copies by hand and mail.

To receive a printed copy of this report, please email: [waterquality@phila.gov](mailto:waterquality@phila.gov).

### People with special health concerns

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 and other immune system disorders, and 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.

U.S. Environmental Protection Agency (EPA)/Centers for Disease Control CDC guidelines on appropriate means to lessen the risk of drinking water contaminants are available from the Safe Drinking Water Hotline: (800) 426-4791.

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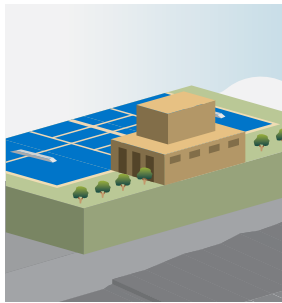
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## How this document is organized:

This story follows our water quality work from **source** and **treatment** through **delivery** to your home.



### *Part One:* **Source & Treatment**

Philly's local water sources—and what we do to keep water safe

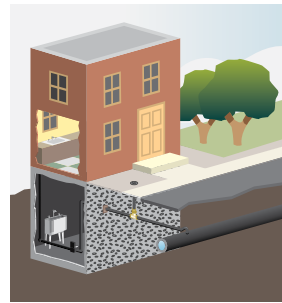
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### *Part Two:* **Delivery**

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The final stretch to your tap

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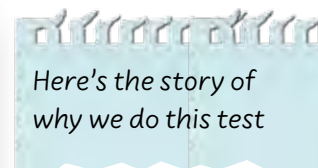


### **2021 Data Tables & More**

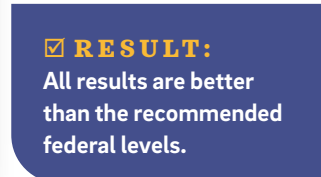
*pages 15–23*

## Look for these quick guides throughout the report:

Charts and graphs let you see the data in a new way. ➤



Handwritten notes explain how and why we do these tests. ◀



Look here for key takeaways. ◀

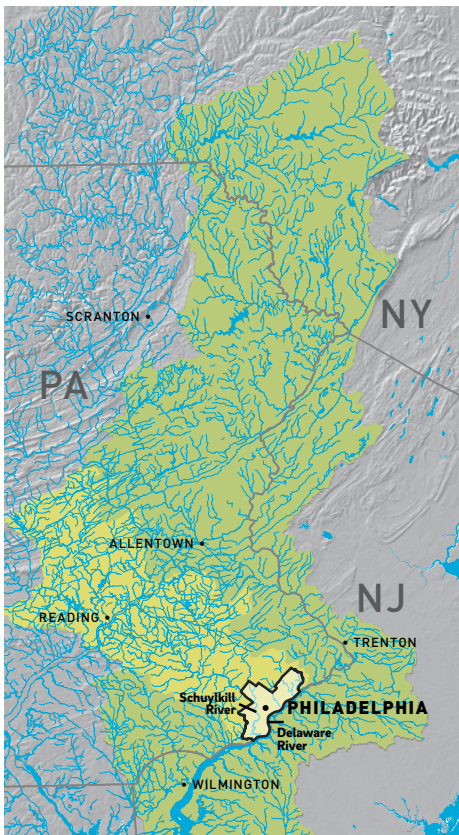
## Part One

# Source & Treatment



## Your water begins in freshwater streams.

Philadelphia's water comes from the Delaware River Watershed. The watershed begins in New York State and extends 330 miles south to the mouth of the Delaware Bay. The Schuylkill River is part of the Delaware River Watershed.



### Philadelphia source watersheds

- Delaware River Watershed
- Schuylkill River Watershed

### Protection starts at the sources.

We take a holistic approach, beginning with Philadelphia's water supply. We monitor actual pollution sources and look for potential sources of contamination. We keep track of water availability and flow.

### Our wide range of tools includes:

#### Research

- We study regional influences, such as natural gas drilling and global influences, like sea level rise.

#### Projects in the field

- We protect against stormwater and agricultural runoff.
- We monitor water contaminants.

#### Partnerships

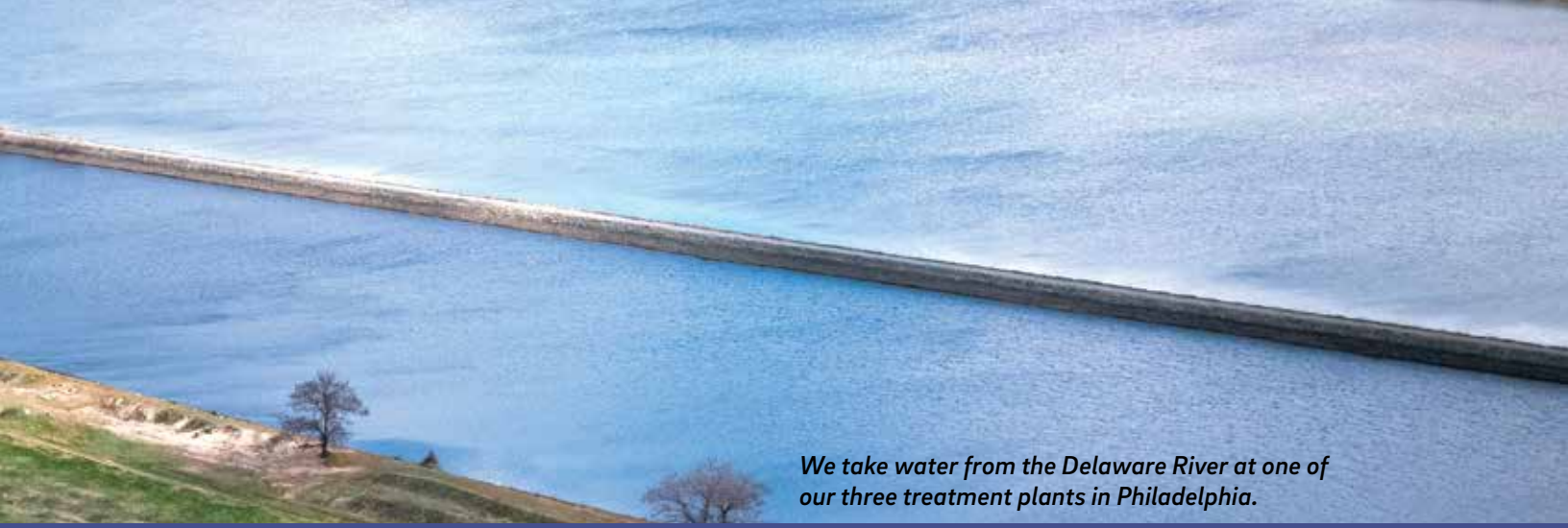
- We team up with organizations across the region to protect our entire watershed.

### Looking closely for potential threats

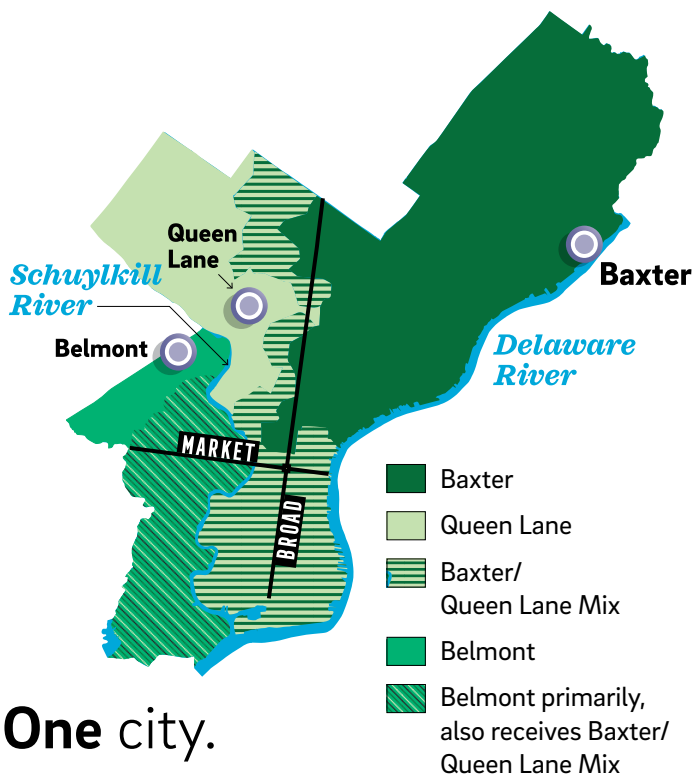
*Cryptosporidium*, a microscopic organism sometimes found in freshwater, can cause illness in humans. We are one of the nation's leaders in *Cryptosporidium* research. We work closely with the Philadelphia Department of Public Health to ensure our tap water is free of *Cryptosporidium* and other organisms.

**Per- and polyfluoroalkyl substances (PFAS)** are potentially harmful chemicals that have been used in industry and many consumer products. We voluntarily test for PFAS in the city's rivers and creeks. PWD's water sampling has not detected amounts at or above the EPA's health advisory levels.

A recent independent test by the Pennsylvania Department of Environmental Protection showed no detectable PFAS concentrations in Philadelphia's treated drinking water.



We take water from the Delaware River at one of our three treatment plants in Philadelphia.



**One** city.  
**Two** rivers.  
**Three** treatment plants.

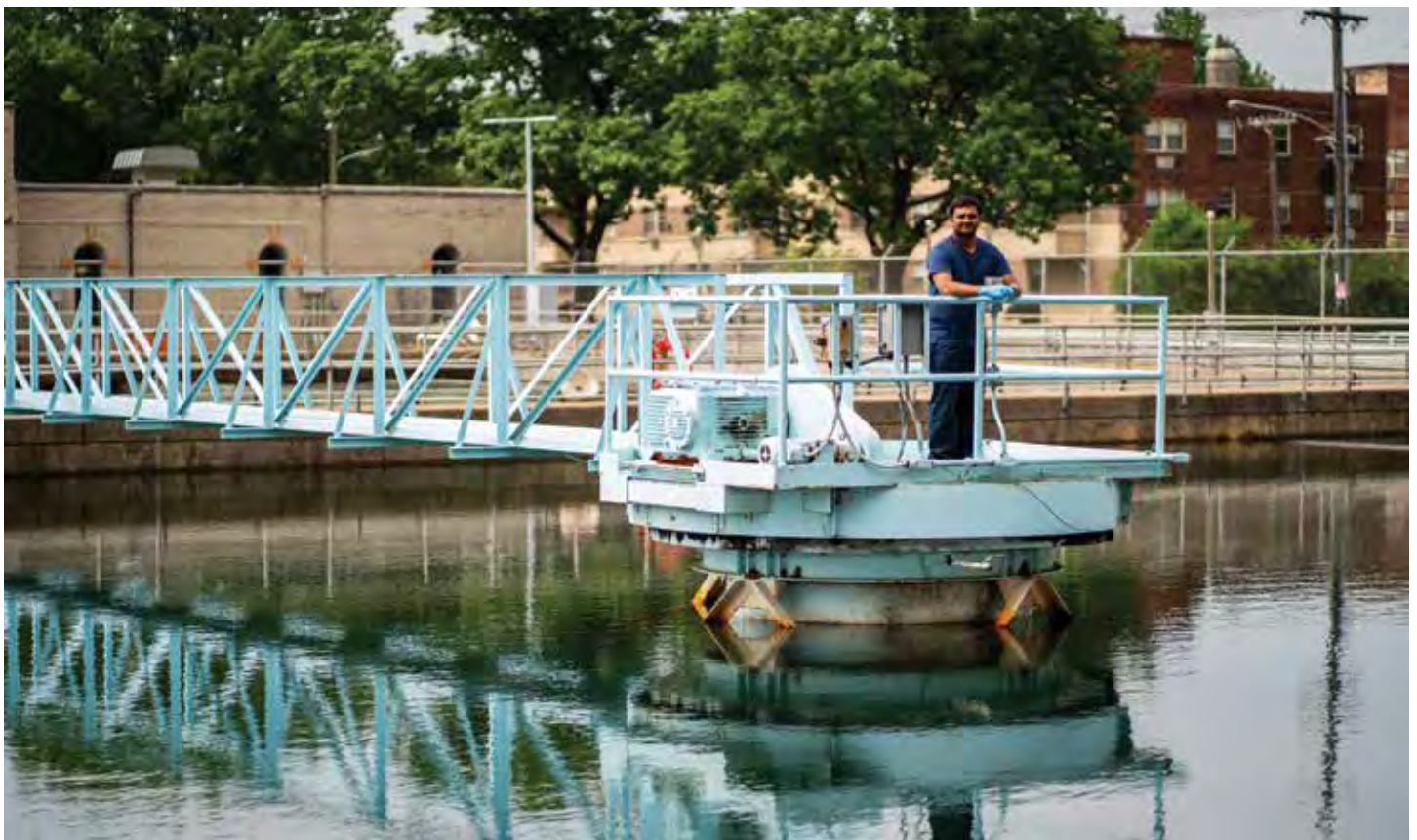
Philadelphia has two rivers that provide our drinking water: the Delaware River and the Schuylkill River. PWD operates three water treatment plants: **Baxter, Queen Lane, and Belmont.**

Where you live in Philadelphia determines which plant(s) treat your water!

High-quality staff.  
 High-quality results.

The experts working at our treatment plants take pride in using water drawn from our local rivers.

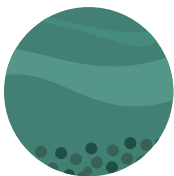
Hundreds of millions of gallons of top-quality drinking water are produced every day.



## Drinking Water Treatment Plants: An important early step in water's journey.

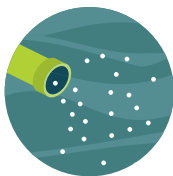
### Treatment processes

Once collected, river water goes through multiple processes to ensure it's crystal clear and safe.



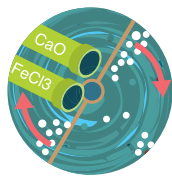
#### Gravity settling

River water is pumped to reservoirs. Sediment settles.



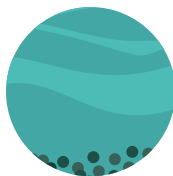
#### Disinfection

We add Sodium Hypochlorite to kill harmful organisms.



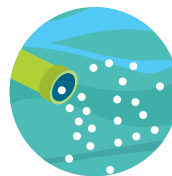
#### Coagulant, flocculation, and pH

Gentle mixing helps particles clump together. We also adjust the acidity.



#### Additional settling

Clumps of particles settle and are removed.



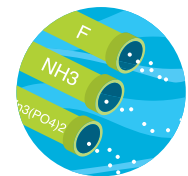
#### Additional disinfection

We add Sodium Hypochlorite a second time to kill any remaining harmful organisms.



#### Filtration

Filters remove more microscopic particles.



#### Additional treatment

Ingredients like Fluoride, Zinc Phosphate, and Ammonia help keep water healthy and safe





## A CLOSER LOOK



### Hardness

The hardness of water is determined by the minerals naturally dissolved in it.

Hardness can vary based on natural conditions – for example, a drought can impact hardness.

Hardness matters if you use your water for activities, such as brewing beer or keeping a home aquarium. Customers often ask about hardness when researching appliances like dishwashers.

## Before it leaves the plant

We test our treated water for about 100 regulated contaminants, ranging from organisms like bacteria to chemicals like nitrate.

In 2021, we found no violations under state and federal regulations.

### Final touches

#### Chlorine + Ammonia

Chlorine protects us from organisms found in untreated water that can cause disease. Ammonia is added to make the chlorine last longer and reduce the bleach-like smell.

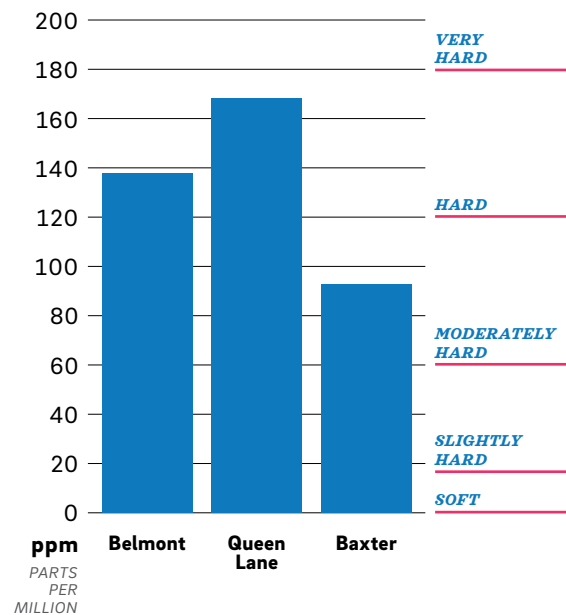
#### Fluoride

All water contains some fluoride. We adjust the natural levels slightly to help protect your teeth against decay.

#### Zinc orthophosphate

Zinc orthophosphate is a compound that helps form a protective coating form on pipes. It prevents corrosion (or breaking down over time).

### 2021 Results



### What this means for you

#### RESULT:

Philadelphia's water is moderately hard or hard, depending on which treatment plant serves your neighborhood.

Hardness matters if you use your water for activities like brewing beer or keeping a home aquarium.

**Most customers don't need to monitor their water's hardness.**

# Part Two

# Delivery



## A safe path through the system

We have about 3,100 miles of water mains that deliver clean tap to customers. To ensure water stays safe as it moves from the plant to you, we take samples and monitor real-time water quality data 24/7.



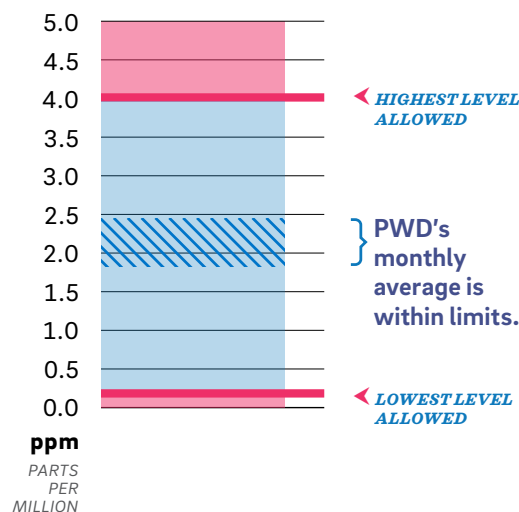
### A CLOSER LOOK



#### Residual Chlorine

This test is done throughout the system. It checks that the chlorine added at plants remains at levels that keep water fresh and safe while staying within regulations.

#### 2021 Results



#### What this means for you

**RESULT:**  
Better than standards.

We travel the city to collect samples of drinking water from fire and police stations, pumping stations, and more.

**We do over 400 of these tests every month!**



Large scale water mains help transport water from treatment plants to customers.

# Water Revitalization Plan

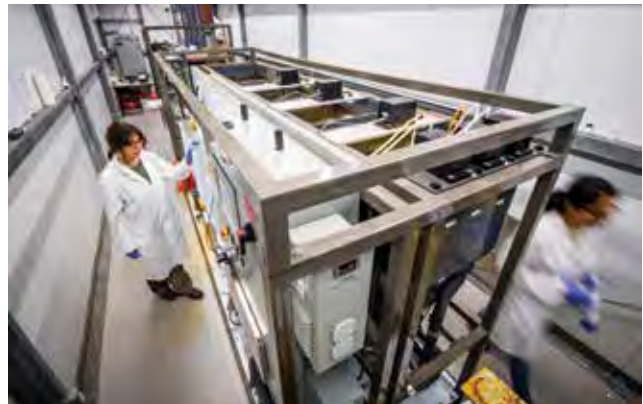
**Philadelphia has a 25-year plan to upgrade and strengthen essential drinking water infrastructure.**

From facilities to water mains, we're keeping the system safe, reliable, and resilient for the future.

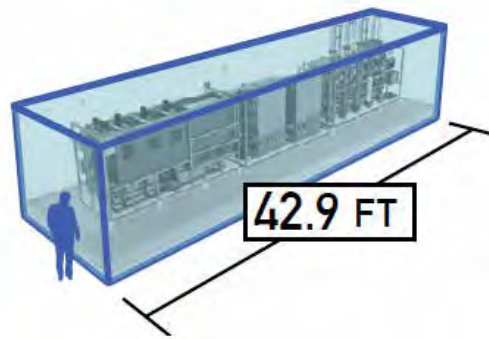
We've coordinated several large-scale projects to maximize benefits for Philadelphians while reducing interruptions and service impacts.

## PLAN SPOTLIGHT:

### *A Mini Water Treatment Plant*



Within a container about the size of a trailer, PWD scientists are testing the methods planned for an upgraded treatment plant. This mini laboratory allows us to test processes before they're used at a larger scale.



**Learn more: [water.phila.gov/revitalization](http://water.phila.gov/revitalization)**

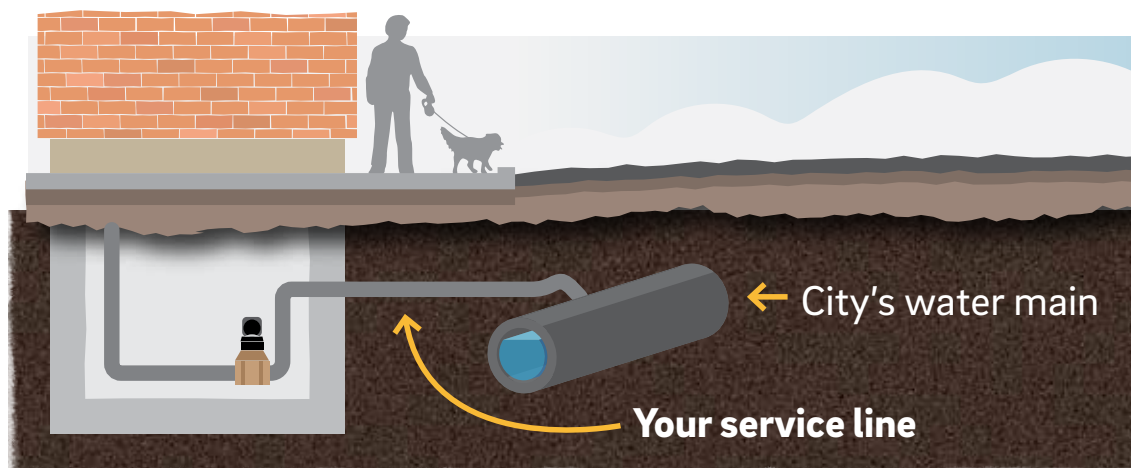
# Part Three

# At Home



## Your Service Line: The final stretch

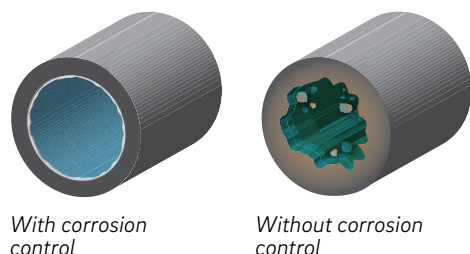
Once it leaves our water main and enters your service line, you and your property's plumbing can play a role in keeping water safe.



The service line leading to your water meter is part of your home's plumbing.

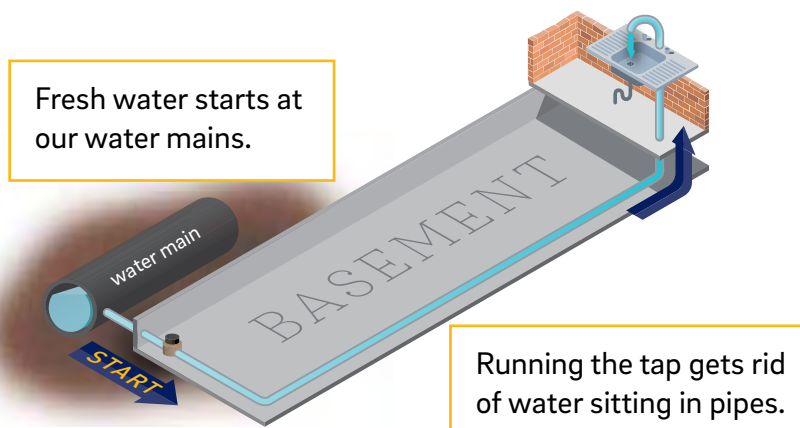
### Corrosion Control

Philadelphia has a corrosion control program mandated by federal law and optimized over the past two decades. It minimizes the release of lead from service lines, indoor pipes, fixtures, and solder by creating a coating designed to keep lead from leaching into the water.



### What do we mean by "flushing your pipes"?

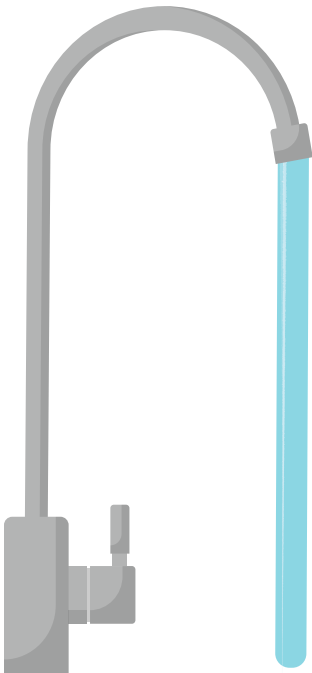
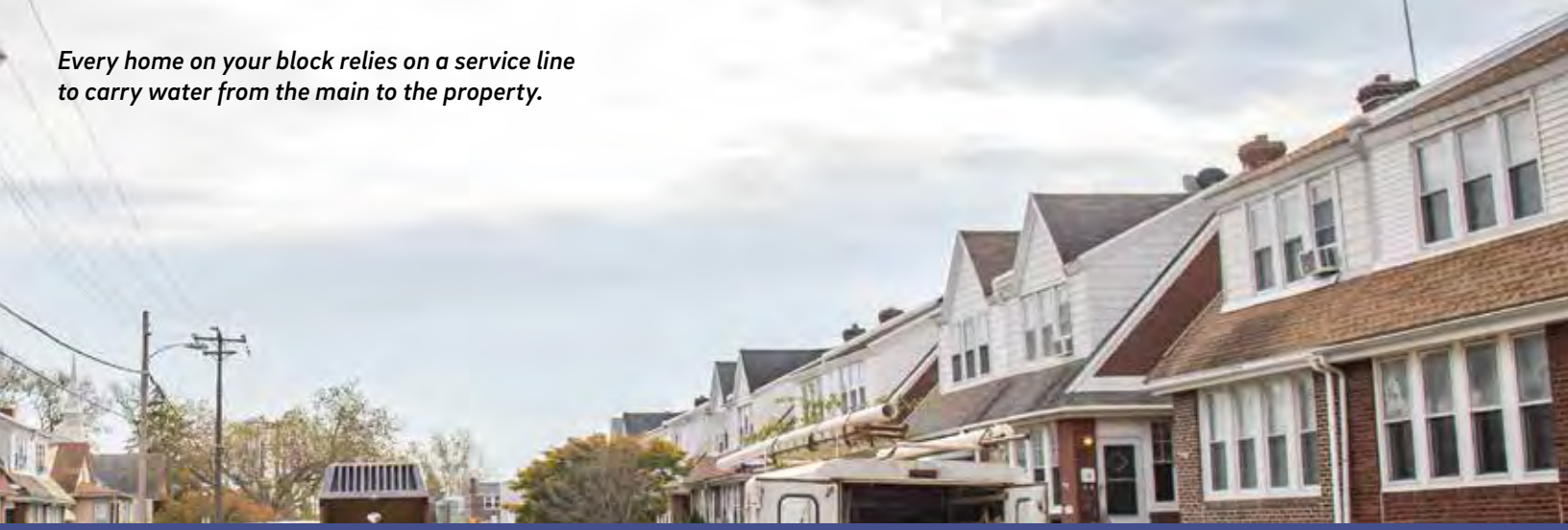
Flushing pushes the water that is sitting in pipes out and down your drain until fresh water comes through the tap. When pipes are disturbed during construction or repairs, they might require flushing.



Fresh water starts at our water mains.

Running the tap gets rid of water sitting in pipes.

Every home on your block relies on a service line to carry water from the main to the property.



## Healthy home habit

If you haven't used water for 6 hours or more: Run your cold water for 3–5 minutes. This will flush out water that's been sitting in your pipes.

It only costs a penny or two to ensure top-quality tap!

## Talking about tap water

In neighborhoods across Philadelphia, our customers tell us what matters to them. When it comes to tap water, there's a lot to talk about!

For starters, some residents are surprised they can get great drinking water right at home for less than a penny per gallon.

In each conversation, we hear loud and clear: **Safe drinking water is a top priority, and lead is a topic people want to learn more about.**



# Our drinking water mains are not made of lead.

However, some older buildings may have lead plumbing.

## Lead in a property's plumbing

### A home's older fixtures & valves:

Lead can be found in older fixtures and valves, and in old solder, where pipes are joined.

### Service Line:

This pipe connects a property's plumbing to the water main in the street and is the responsibility of the property owner.

## A CLOSER LOOK

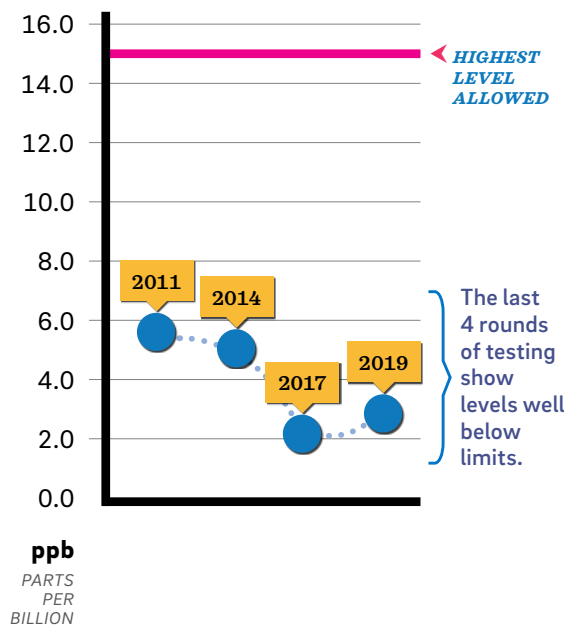
### Carefully monitoring Lead

In addition to conducting regular tests in customer homes, every three years we complete a rigorous round of sampling for lead and copper. We take samples from homes that have lead service lines.

We share the results with the EPA and the public.

The EPA requires that 90% of homes show lead levels less than 15 ppb.

### Recent results



### What this means for you



Soon, the EPA will update their guidelines for sampling. This will impact future results. We support this effort to make sure sampling is accurate, and to help identify homes with lead plumbing.

**RESULT:**  
Lead levels are consistently lower than limits set by the EPA.

## US EPA Guidance

The EPA requires public water providers like the Philadelphia Water Department to monitor drinking water for lead at customer taps. If lead levels are higher than 15 parts per billion (ppb) in more than 10% of taps sampled, water providers must inform customers and take steps to reduce lead in water.

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 material and components associated with service lines and home plumbing.

The Philadelphia Water Department is responsible for providing safe drinking water but cannot control the variety of materials used in plumbing components. If you haven't turned on your tap for several hours, you can minimize the potential for lead exposure by flushing your tap before using water for drinking and 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 (800) 426-4791 or at: [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).



### We offer a zero-interest loan for replacing lead service lines.

The Homeowners Emergency Loan Program (HELP) can cover the cost of a replacement.

➤ Learn more & apply: [www.phila.gov/water/helploan](http://www.phila.gov/water/helploan)

# 2021 Data tables & More



**All of PWD's results are better than the required and recommended federal levels designed to protect public health.**

This data shows how our process keeps your drinking water safe.

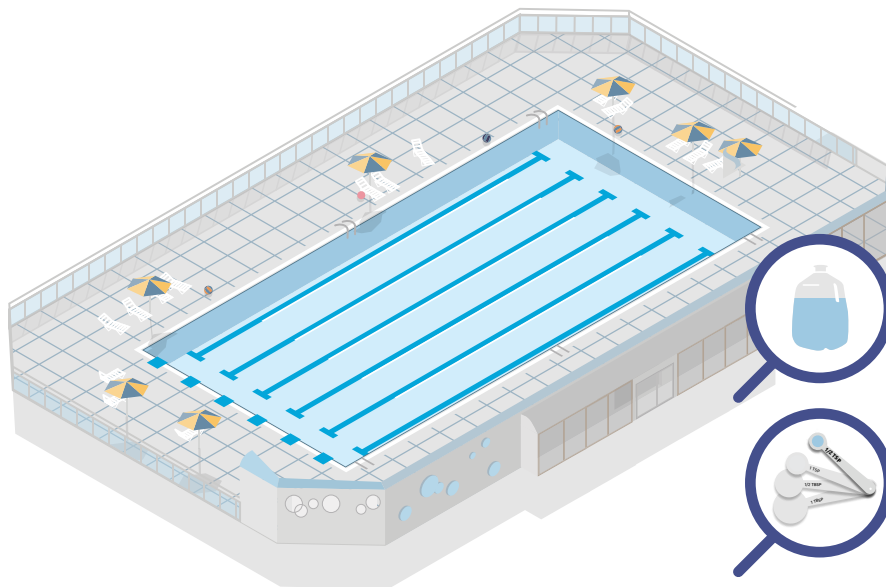
By reporting these results in these tables, we are meeting a requirement of the EPA.

Some contaminants may pose a health risk at certain levels to people with special health concerns. Others are used as indicators for treatment plant performance.

## What's a "PPM"?

Many of these results are reported as "parts per million (ppm)" or "parts per billion (ppb)".

**Here's what that looks like:**



### *PPM vs. PPB*

#### **ppm (parts per million):**

Denotes 1 part per 1,000,000 parts, which is equivalent to **two-thirds of a gallon** in an Olympic-sized swimming pool.

#### **ppb (parts per billion):**

Denotes 1 part per 1,000,000,000 parts, which is equivalent to **half a teaspoon** in an Olympic-sized swimming pool.

For more abbreviations and their definitions, visit the Glossary on page 22.

# What we test for and how

Public drinking water systems monitor their treated drinking water for approximately 100 regulated contaminants. These regulatory parameters are defined within federal rules such as the Revised Total Coliform Rule, Surface Water Treatment Rule, Disinfectants and Disinfection Byproducts Rules, Lead and Copper Rule, and the Radionuclides Rule.

**We monitor for the regulated parameters listed below.**

**Any contaminants found are noted in the tables on the following pages:**

## Inorganic Chemicals

|           |          |
|-----------|----------|
| Antimony  | Fluoride |
| Arsenic   | Lead     |
| Barium    | Mercury  |
| Beryllium | Nickel   |
| Cadmium   | Nitrate  |
| Chromium  | Nitrite  |
| Copper    | Selenium |
| Cyanide   | Thallium |

## Synthetic Organic Chemicals

|                              |                           |
|------------------------------|---------------------------|
| 2,3,7,8 - TCDD (Dioxin)      | Ethylene Dibromide        |
| 2,4 - D, 2,4,5 - TP (Silvex) | Glyphosate                |
| Alachlor                     | Heptachlor                |
| Atrazine                     | Heptachlor epoxide        |
| Benzopyrene                  | Hexachlorobenzene         |
| Carbofuran                   | Hexachlorocyclopentadiene |
| Chlordane                    | Lindane                   |
| Dalapon                      | Methoxychlor              |
| Di(ethylhexyl)adipate        | Oxamyl                    |
| Di(ethylhexyl)phthalate      | PCBs Total                |
| Dibromochloropropane         | Pentachlorophenol         |
| Dinoseb                      | Picloram                  |
| Diquat                       | Simazine                  |
| Endothall                    | Toxaphene                 |
| Endrin                       |                           |

## Volatile Organic Chemicals

|                            |                        |
|----------------------------|------------------------|
| Benzene                    | Styrene                |
| Carbon Tetrachloride       | Tetrachloroethylene    |
| 1,2-Dichloroethane         | Toluene                |
| o-Dichlorobenzene          | 1,2,4-Trichlorobenzene |
| p-Dichlorobenzene          | 1,1,1-Trichloroethane  |
| 1,1-Dichloroethylene       | 1,1,2-Trichloroethane  |
| cis-1,2-Dichloroethylene   | Trichloroethylene      |
| trans-1,2-Dichloroethylene | o-Xylene               |
| Dichloromethane            | m,p-Xylenes            |
| 1,2-Dichloropropane        | Vinyl Chloride         |
| Ethylbenzene               |                        |
| Monochlorobenzene          |                        |

## Other factors that can impact drinking water

### Appealing to Your Senses



We work to ensure your water looks, tastes, and smells the way it should.

To meet all water quality taste and odor guidelines, we test for the following: alkalinity, aluminum, chloride, color, hardness, iron, manganese, odor, pH, silver, sodium, sulfate, surfactants, total dissolved solids, turbidity, and zinc.



### Temperature and Cloudiness

The temperature of the Schuylkill and Delaware Rivers varied seasonally in 2021 from approximately 34°–82° Fahrenheit. PWD does not treat the water for temperature.



Cloudiness in tap water most commonly happens in the winter, when the cold water from the water main is warmed up quickly in household plumbing. Cold water and water under pressure can hold more air than warmer water and water open to the atmosphere.

When really cold winter water comes out of your tap, it's simultaneously warming up and being relieved of the pressure it was under inside the water main and in your plumbing. The milky white color is actually just tiny air bubbles. If you allow the glass to sit undisturbed for a few minutes, you will see it clear up gradually.



# 2021 Data tables

## Sodium, Hardness, and Alkalinity in tap water

The parameters listed below are not part of EPA's requirements and are provided for information purposes.

### **WATER TIP:**

Parameters like these matter if you use your water for activities like brewing beer or keeping a home aquarium.

### SODIUM IN TAP WATER

|                                      | Baxter WTP<br>One Year Average | Belmont WTP<br>One Year Average | Queen Lane WTP<br>One Year Average |
|--------------------------------------|--------------------------------|---------------------------------|------------------------------------|
| Average (ppm)                        | 24 ppm                         | 43 ppm                          | 44 ppm                             |
| Average (mg in 8 oz. glass of water) | 6 mg                           | 10 mg                           | 10 mg                              |
| Range (ppm)                          | 16–64 ppm                      | 30–84 ppm                       | 29–121 ppm                         |
| Range (mg in 8 oz. glass of water)   | 4–15 mg                        | 7–20 mg                         | 7–29 mg                            |

### HARDNESS IN TAP WATER

|         | Baxter WTP<br>One Year Average | Belmont WTP<br>One Year Average | Queen Lane WTP<br>One Year Average |
|---------|--------------------------------|---------------------------------|------------------------------------|
| Average | 92 ppm or 5 gpg                | 139 ppm or 8 gpg                | 169 ppm or 10 gpg                  |
| Minimum | 75 ppm or 4 gpg                | 110 ppm or 6 gpg                | 123 ppm or 7 gpg                   |
| Maximum | 114 ppm or 7 gpg               | 170 ppm or 10 gpg               | 209 ppm or 12 gpg                  |

Hardness defines the quantity of minerals, such as calcium and magnesium, in water. These minerals react with soap to form insoluble precipitates and can affect common household chores such as cooking and washing. Philadelphia's water is considered "medium" hard.

### ALKALINITY IN TAP WATER

|         | Baxter WTP<br>One Year Average | Belmont WTP<br>One Year Average | Queen Lane WTP<br>One Year Average |
|---------|--------------------------------|---------------------------------|------------------------------------|
| Average | 35 ppm                         | 68 ppm                          | 77 ppm                             |
| Minimum | 25 ppm                         | 41 ppm                          | 53 ppm                             |
| Maximum | 45 ppm                         | 92 ppm                          | 98 ppm                             |

## Secondary Chemicals

EPA has established National Secondary Drinking Water Regulations (NSDWRs) that set non-mandatory water quality standards. EPA does not enforce these "secondary maximum contaminant levels" (SMCLs). They are established as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color, and odor. These contaminants are not considered to present a risk to human health at the SMCL.

| <b>SECONDARY MCLs: AESTHETIC IMPACTS IN TAP WATER</b> |                   |                                       |  |   |                    |
|---|-------------------|---------------------------------------|--|---|--------------------|
|   | <b>EPA's SMCL</b> | <b>Baxter WTP<br/>One Year Range*</b> | <b>Belmont WTP<br/>One Year Range*</b> | <b>Queen Lane WTP<br/>One Year Range*</b> | <b>Violation**</b> |
| Chloride  | 250 ppm           | 50–143 ppm                            | 64–171 ppm                             | 75–261 ppm                                | No                 |
| Copper  | 1.0 ppm           | <0.001–0.002 ppm                      | 0.006–0.019 ppm                        | 0.020–0.046 ppm                           | No                 |
| Fluoride  | 2 ppm***          | 0.62 ppm                              | 0.71 ppm                               | 0.71 ppm                                  | No                 |
| Iron  | 0.3 ppm           | <0.010–0.016 ppm                      | <0.010 ppm                             | <0.010–0.020 ppm                          | No                 |
| pH  | 6.5–8.5           | 7.10–7.25                             | 7.10–7.30                              | 6.97–7.34                                 | No                 |
| Sulfate   | 250 ppm           | 7.35–34.20 ppm                        | 12.30–49.50 ppm                        | 17.40–47.90 ppm                           | No                 |
| Total Dissolved Solids                                | 500 ppm           | 136–346 ppm                           | 200–468 ppm                            | 230–576 ppm                               | No                 |

PWD also monitored for Aluminum, Color, Manganese, and Silver in 2021; all results were below respective parameter detection limits.

\*Ranges with a less than symbol "<" indicate some results were below the method detection limit for 2021.

\*\*Individual results are averaged monthly. Compliance is based on locational running annual average.

\*\*\*EPA's MCL and MCLG is 4 ppm, but PADEP has set this lower MCL and MCLG which takes precedence.

| <b>Sources of Secondary Chemicals</b>   |   |   |  |  |   |  |
|---|---|---|--|--|---|--|
| <b>Chloride</b>   | <b>Copper</b>   | <b>Fluoride</b>   | <b>Iron</b>  | <b>pH</b>                                    | <b>Sulfate</b>  | <b>Total Dissolved Solids</b>  |
| Main component of many salts, may increase in winter months; Erosion of natural minerals; Used in the water treatment process in the form of ferric chloride. | Corrosion of copper pipes in premise plumbing; Erosion of natural deposits. | Erosion of natural deposits; Water additive that promotes strong teeth; Discharge from fertilizer and aluminum factories. | Corrosion of iron water mains and premise plumbing; Erosion of natural minerals; Used in the water treatment process in the form of ferric chloride. | Adjusted during the water treatment process. | Erosion of natural minerals; Runoff from mining operations. | Erosion of natural minerals; May increase during winter months due to road salt runoff or during drought conditions. |

**LEAD & COPPER** – Tested at customers' taps: *Testing is done every 3 years. Most recent tests were done in 2019.*

|        | EPA's Action Level - for a representative sampling of customer homes | Ideal Goal (EPA's MCLG) | 90% of PWD customers' homes were less than | Number of homes considered to have elevated levels | Violation | Source   |
|--------|--|-------------------------|--|--|-----------|--|
| Lead   | 90% of homes must test less than 15 ppb                              | 0 ppb                   | 3.0 ppb                                    | 2 out of 99  | No        | Corrosion of household plumbing; Erosion of natural deposits                                   |
| Copper | 90% of homes must test less than 1.3 ppm                             | 1.3 ppm                 | 0.28 ppm                                   | 0 out of 99  | No        | Corrosion of household plumbing; Erosion of natural deposits; Leaching from wood preservatives |

**INORGANIC CHEMICALS (IOC)** – PWD monitors for IOC more often than required by EPA.

| Chemical | Highest Level Allowed (EPA's MCL) | Ideal Goal (EPA's MCLG) | Highest result | Range of Test Results for the Year | Violation | Source  |
|----------|-----------------------------------|-------------------------|----------------|------------------------------------|-----------|---|
| Antimony | 6 ppb                             | 6 ppb                   | 0.3 ppb        | 0–0.3 ppb                          | No        | Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder                                       |
| Barium   | 2 ppm                             | 2 ppm                   | 0.051 ppm      | 0.028–0.051 ppm                    | No        | Discharges of drilling wastes; Discharge from metal refineries; Erosion of natural deposits                               |
| Chromium | 100 ppb                           | 100 ppb                 | 3 ppb          | 0–3 ppb                            | No        | Discharge from steel and pulp mills; Erosion of natural deposits  |
| Fluoride | 2 ppm*                            | 2 ppm*                  | 0.71 ppm       | 0.62–0.71 ppm                      | No        | Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories |
| Nitrate  | 10 ppm                            | 10 ppm                  | 3.84 ppm       | 0.64–3.84 ppm                      | No        | Runoff from fertilizer use; Leaching from septic tanks; Erosion of natural deposits                                       |

\*EPA's MCL and MCLG is 4 ppm, but PADEP has set this lower MCL and MCLG which takes precedence.

**TOTAL CHLORINE RESIDUAL** – Continuously monitored at Water Treatment Plants

| Sample Location | Minimum Disinfectant Residual Level Allowed | Lowest Level Detected | Yearly Range  | Violation | Source                                  |
|-----------------|---|-----------------------|---------------|-----------|---|
| Baxter WTP      | 0.2 ppm                                     | 2.39 ppm              | 2.39–3.88 ppm | No        | Water additive used to control microbes |
| Belmont WTP     |   | 1.63 ppm              | 1.63–2.87 ppm |           |   |
| Queen Lane WTP  |   | 2.02 ppm              | 2.02–3.99 ppm |           |   |

**TOTAL CHLORINE RESIDUAL** – Tested throughout the Distribution System. Over 360 samples collected throughout the City every month.

| Sample Location     | Maximum Disinfectant Residual Allowed | Highest Monthly Average | Monthly Average Range | Violation | Source                                  |
|---------------------|---------------------------------------|-------------------------|-----------------------|-----------|---|
| Distribution System | 4.0 ppm                               | 2.46 ppm                | 1.86–2.46 ppm         | No        | Water additive used to control microbes |

**TOTAL ORGANIC CARBON** – Tested at Water Treatment Plants

| Treatment Technique Requirement       | Baxter WTP One Year Average | Belmont WTP One Year Average | Queen Lane WTP One Year Average | Violation | Source                                |
|---------------------------------------|-----------------------------|------------------------------|---------------------------------|-----------|---------------------------------------|
| Percent of Removal Required           | 35–45%                      | 25–35%                       | 25–35%                          | n/a       | Naturally present in the environment. |
| Percent of Removal Achieved*          | 0–72%                       | 7–67%                        | 19–72%                          | No        |                                       |
| Number of Quarters out of Compliance* | 0                           | 0                            | 0                               |           |                                       |

\*PWD achieved TOC removal requirements in all quarters of 2021 at all WTPs. Compliance is based on a running annual average computed quarterly. The numbers shown represent a range of TOC results in weekly samples.

**TURBIDITY, A MEASURE OF CLARITY** – Tested at Water Treatment Plants

|  | Baxter WTP One Year Average | Belmont WTP One Year Average | Queen Lane WTP One Year Average | Violation | Source                      |
|--|-----------------------------|------------------------------|---------------------------------|-----------|-----------------------------|
| Treatment Technique Requirement: <i>95% of samples must be at or below 0.300 NTU</i> | 100% below 0.300 NTU        | 100% below 0.300 NTU         | 100% below 0.300 NTU            | n/a       | Soil runoff, river sediment |
| Highest single value for the year  | 0.096 NTU                   | 0.080 NTU                    | 0.196 NTU                       | No        |                             |

The turbidity of Philadelphia's water in 2021 was 86 percent below the maximum level of 0.3 NTU allowed by the State and Federal Regulations and was 57 percent below the Partnership for Safe Water turbidity goal of 0.1 NTU.

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. PWD continuously operates and monitors water quality from a total of 160 filters at three drinking water treatment plants.

**DISINFECTION BYPRODUCTS**

|                               | Highest Level Allowed (EPA's MCL) - One Year Average | Running Annual Average 2021* | System Wide Range of Results | Violation | Source                                   |
|-------------------------------|--|------------------------------|------------------------------|-----------|--|
| Total Trihalomethanes (TTHMs) | 80 ppb   | 49 ppb                       | 13–101 ppb                   | No        | Byproduct of drinking water disinfection |
| 5 Haloacetic acids (HAA5)     | 60 ppb   | 46 ppb                       | 10–88 ppb                    | No        | Byproduct of drinking water disinfection |

\*Monitoring is conducted at 16 locations throughout the City of Philadelphia. This result is the highest locational running annual average in 2021.

**UNREGULATED CONTAMINANT MONITORING (UCMR)<sup>1</sup>**

| Chemical                                | Testing Period        | Average     | Range         |
|---|-----------------------|-------------|---------------|
| Anatoxin-a                              | 07/14/2020–10/20/2020 | 0.00125 ppb | 0–0.03 ppb    |
| Bromide <sup>2</sup>                    | 1/14/2020             | 0.034 ppm   | 0–0.052 ppm   |
| Total Organic Carbon (TOC) <sup>2</sup> | 1/14/2020             | 2.27 ppm    | 2.19–2.34 ppm |
| HAA5 Total <sup>3</sup>                 | 1/14/2020             | 21.3 ppb    | 14.8–31.3 ppb |
| HAA6Br Total <sup>4</sup>               | 1/14/2020             | 7.1 ppb     | 3.8–10.3 ppb  |
| HAA9 Total <sup>5</sup>                 | 1/14/2020             | 28.2 ppb    | 23.6–35.5 ppb |
| Manganese                               | 1/15/2020             | 0.55 ppb    | 0–0.95 ppb    |

<sup>1</sup> Unless otherwise noted, samples were collected from finished water sampling locations.

<sup>2</sup> Bromide and TOC represent source water samples.

<sup>3</sup> HAA5 Total - Dibromoacetic Acid, Dichloroacetic Acid, Monobromoacetic Acid, Monochloroacetic Acid, and Trichloroacetic Acid

<sup>4</sup> HAA6Br Total - Bromochloroacetic Acid, Bromodichloroacetic Acid, Dibromoacetic Acid, Dibromochloroacetic Acid, Monobromoacetic Acid, and Tribromoacetic Acid

<sup>5</sup> HAA9 Total - Bromochloroacetic Acid, Bromodichloroacetic Acid, Chlorodibromoacetic Acid, Dibromoacetic Acid, Dichloroacetic Acid, Monobromoacetic Acid, Monochloroacetic Acid, Tribromoacetic Acid, and Trichloroacetic Acid

In 2020, PWD performed special monitoring as part of the Unregulated Contaminant Monitoring Rule (UCMR), a nationwide monitoring effort conducted by the EPA. Unregulated contaminants are those that do not yet have a drinking water standard set by the EPA. The purpose of monitoring for these contaminants is to help the EPA decide whether the contaminants should have a standard. For more information concerning UCMR, visit these websites: <https://www.epa.gov/dwucmr/fourth-unregulated-contaminant-monitoring-rule> or <https://drinktapp.org/Water-Info/Whats-in-My-Water/Unregulated-Contaminant-Monitoring-Rule-UCMR>

**UNREGULATED CONTAMINANTS NOT DETECTED AT ANY OF THE SAMPLING LOCATIONS:**

1-Butanol, 2-Methoxyethanol, 2-Propen-1-ol, alpha-Hexachlorocyclohexane, anatoxin-a, Butylated Hydroxyanisole, Chlorpyrifos, Cylindrospermopsin, Dimethipin, Ethoprop, Germanium, Microcystin Total, Nodularin, o-Toluidine, Oxyfluorfen, Permethrin Total, Profenofos, Quinoline, Tebuconazole, Tribufos

**CRYPTOSPORIDIUM** – Tested at Source Water to Water Treatment Plants prior to treatment in 1/1/2017–3/31/2017

| Treatment Technique Requirement           | Baxter WTP<br>One Year Average | Belmont WTP<br>One Year Average | Queen Lane WTP<br>One Year Average | Source                                |
|---|--------------------------------|---------------------------------|------------------------------------|---------------------------------------|
| Total Number of Samples Collected         | 6                              | 6                               | 6                                  | Naturally present in the environment. |
| Number of <i>Cryptosporidium</i> Detected | 15                             | 2                               | 6                                  |                                       |
|   | 0.250 count/L                  | 0.033 count/L                   | 0.100 count/L                      |                                       |

*Cryptosporidium* is a microbial pathogen found in surface water throughout the U.S. Although filtration removes *Cryptosporidium*, the most commonly-used filtration methods cannot guarantee 100 percent removal. Our monitoring indicates the presence of these organisms in our source water. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease.

# Glossary

Here are definitions for some of the words and phrases we use in the report and in our data tables.

**Action Level:** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. The action level is not based on one sample; instead, it is based on many samples.

**Alkalinity:** A measure of the water's ability to resist changes in the pH level and a good indicator of overall water quality. Although there is no health risk from alkalinity, we monitor it to check our treatment processes.

**E. coli (Escherichia coli):** A type of coliform bacteria that is associated with human and animal fecal waste.

**gpg (grains per gallon):** A unit of water hardness. One grain per gallon is equal to 17.1 parts per million.

**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 Disinfection Level):** The highest level of disinfectant that is allowed in drinking water. The addition of a disinfectant is necessary for the control of microbial contaminants.

**MRDLG (Maximum Residual Disinfection Level Goal):** The level of a disinfectant in drinking water 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.

**Minimum Residual Disinfectant Level:** The minimum level of residual disinfectant required at the entry point to the distribution system.

**NTU (nephelometric turbidity units):** Turbidity is measured with an instrument called a nephelometer. Measurements are given in nephelometric turbidity units.

**Pathogens:** Bacteria, virus, or other microorganisms that can cause disease.

**pCi/L (Picocuries per liter):** A measure of radioactivity.

**ppm (parts per million):** Denotes 1 part per 1,000,000 parts, which is equivalent to two-thirds of a gallon in an Olympic-sized swimming pool.

**ppb (parts per billion):** Denotes 1 part per 1,000,000,000 parts, which is equivalent to half a teaspoon in an Olympic-sized swimming pool.

**µg/L (Microgram per liter):** One microgram per liter is equal to one part per billion.

**ppt (parts per trillion):** Denotes 1 part per 1,000,000,000,000 parts, which is equivalent to one drop in 20 Olympic-sized swimming pools.

**SMCL (Secondary Maximum Contaminant Level):** Non-enforceable Federal water quality guidelines that are established for managing aesthetic and cosmetic conditions of water (e.g. taste, odor, color).

**SOC (Synthetic Organic Chemical):** Commercially made organic compounds, such as pesticides and herbicides.

**Total Coliform:** Coliforms are bacteria that are naturally present in the environment. Their presence in drinking water may indicate that other potentially harmful bacteria are also present.

**THAAs (Total Haloacetic Acids):** A group of chemicals known as disinfection byproducts. These form when a disinfectant reacts with naturally occurring organic and inorganic matter in the water.

**TOC (Total Organic Carbon):** A measure of the carbon content of organic matter. This measure is used to indicate the amount of organic material in the water that could potentially react with a disinfectant to form disinfection byproducts.

**TTHMs (Total Trihalomethanes):** A group of chemicals known as disinfection byproducts. These form when a disinfectant reacts with naturally occurring organic and inorganic matter in the water.

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

**Turbidity:** A measure of the clarity of water related to its particle content. Turbidity serves as an indicator for the effectiveness of the water treatment process. Low turbidity measurements, such as ours, show the significant removal of particles that are much smaller than can be seen by the naked eye.

**VOC (Volatile Organic Chemicals):** Organic chemicals that can be either man-made or naturally occurring. These include gases and volatile liquids.

**WTP:** Water Treatment Plant.

# Top customer questions



## ***How do I get my water tested?***

We offer free lead and copper tests for residential customers who have concerns about their water.

- To request an appointment  
Call (215) 685-6300

## ***How hard is Philadelphia's water?***

Philadelphia's water is considered moderately hard. Hardness depends on the treatment plant that serves your area of the city.

- See *A Closer Look at Hardness*  
Page 9

## ***Why do water utilities add fluoride to water?***

It's a natural element that helps prevent cavities. Philadelphia's Health Department (and dentists) recommend we add fluoride to a level that helps protect children's teeth.

## ***Can I replace a lead service line?***

Yes. If you don't want to contact a plumber directly, apply for our Homeowners Emergency Loan Program (HELP).

A zero-interest loan can cover the cost of replacement.

- Learn more & apply  
[www.phila.gov/water/helploan](http://www.phila.gov/water/helploan)

*Also: PWD will replace lead service lines for free if they are discovered during planned work on water mains.*

## ***Why does water have an earthy flavor sometimes?***

Earthy or musty flavors occur naturally in drinking water and are among the most commonly reported worldwide. When certain algae-type organisms grow in our rivers, detectable levels of these odors can make their way into the treated drinking water.

These natural compounds have no known health effects at their natural levels, and are found in various foods.

We take steps to reduce their presence when detected.

## ***Why does my tap water smell like a pool sometimes?***

The smell of chlorine means your water is safe and treated to remove harmful organisms. You can reduce the smell by keeping a pitcher of fresh water in the refrigerator. This also reduces the earthy odor sometimes produced by algae in the rivers during spring.



# Working together

You can help protect Philadelphia's water quality.

## Keep trash out of our waterways.

Protect our rivers and streams by properly disposing of garbage and recyclable materials.

## Don't flush anything but toilet paper.

Even "flushable" wipes can lead to clogs and backups affecting our homes and streets.

## Always properly recycle or dispose of household hazardous wastes.

Don't flush them down the toilet or down the sink, and don't pour them into storm drains.

## Stay informed

### Sign up for email or text message updates from PWD.



Get the latest news, useful information, and find out about upcoming events. Sign up for email and text alerts at [phillyh2o.info/signup](http://phillyh2o.info/signup).



**PHILADELPHIA**  
**WATER**  
— DEPARTMENT —

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