



2023

Drinking Water Quality Report

WHOLESALE CUSTOMER EXCERPT

Published in 2024

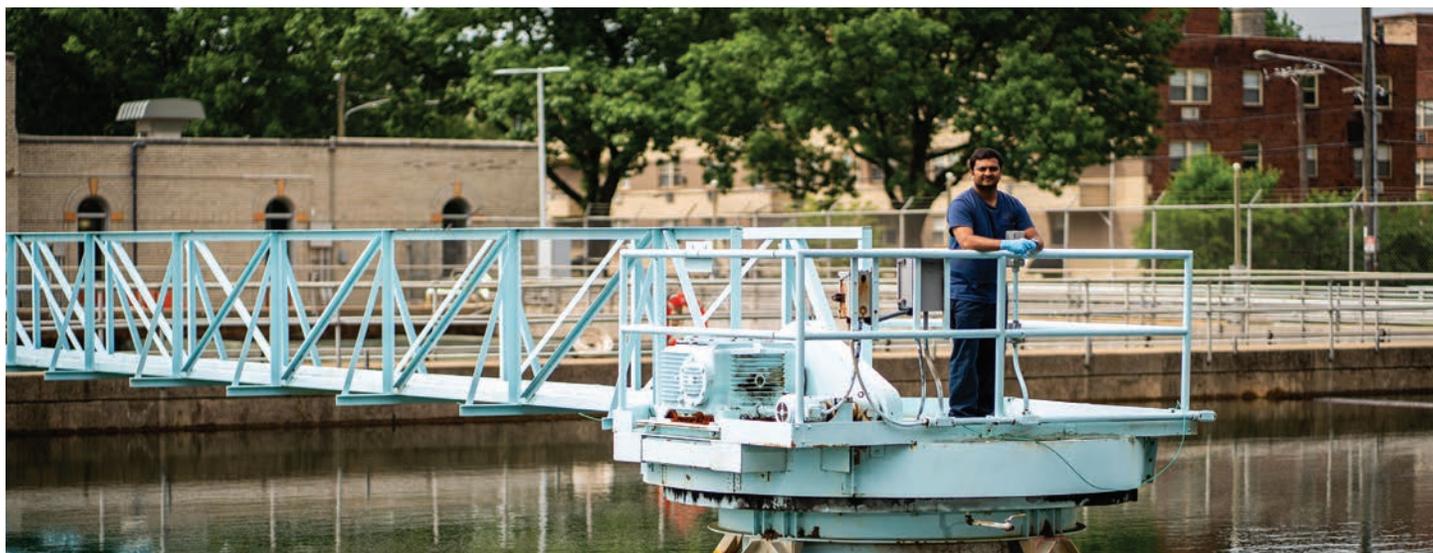
This report is produced for you as a requirement of the Federal Safe Drinking Water Act.

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

PWD's Public Water System Identification #PA1510001

➤ PWD staff ensure high-quality drinking water for everyone in Philadelphia.





About the Wholesale Customer Excerpt

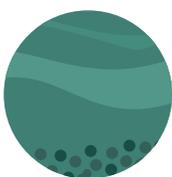
We share our data tables in this format for industrial/commercial customers and consecutive water systems.

▲ Water treatment facility in Philadelphia.

Consecutive water systems are public water systems that obtain their water from another public water system and resell the water, provide treatment, or provide drinking water to an interstate carrier. The term does not include bottled water and bulk water systems.

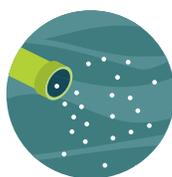
Our Drinking Water Treatment Process

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



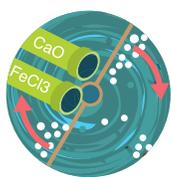
Gravity settling

River water is pumped to reservoirs. Sediment settles.



Disinfection

We add Sodium Hypochlorite to kill harmful organisms.



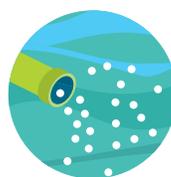
Coagulant, flocculation, and pH

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



Additional settling

Clumps of particles settle and are removed.



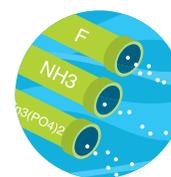
Additional disinfection

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.

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.

Level 1 Assessment: A study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system.

Level 2 Assessment: A very detailed study of the water system to identify potential problems and determine (if possible) why an *E. coli* MCL violation has occurred and/or why total coliform bacteria have been found in our water system on multiple occasions.

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, viruses, 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.

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

Radiological Contaminants

Uranium	Radium 226
Alpha Emitters	Radium 228

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 2022 from approximately 37°–90° 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 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.

2023 Data tables

LEAD & COPPER – Tested at customers' taps: Testing is done every 3 years. Most recent tests were done in 2022.

	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	2.0 ppb	3 out of 104	No	Corrosion of household plumbing; Erosion of natural deposits
Copper	90% of homes must test less than 1.3 ppm	1.3 ppm	0.219 ppm	0 out of 104	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
Barium	2 ppm	2 ppm	0.047 ppm	0.024–0.047 ppm	No	Discharges of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chromium	100 ppb	100 ppb	2 ppb	0–2 ppb	No	Discharge from steel and pulp mills; Erosion of natural deposits
Fluoride	2 ppm*	2 ppm*	0.83 ppm	0.66–0.83 ppm	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Nitrate	10 ppm	10 ppm	3.82 ppm	0.69–3.82 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.

RADIOLOGICAL CONTAMINANTS

	Highest Level Allowed (EPA's MCL)	Ideal Goal (EPA's MCLG)	Highest Result	Range of Test Results for the Year	Violation	Source
Alpha Emitters	15 pCi/L	0 pCi/L	5.32 pCi/L	0–5.32 pCi/L	No	Erosion of natural deposits

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	2.30 ppm	2.30–3.40 ppm	No	Water additive used to control microbes
Belmont WTP		1.86 ppm	1.86–2.71 ppm		
Queen Lane WTP		1.97 ppm	1.97–3.53 ppm		

TOTAL CHLORINE RESIDUAL – Tested throughout the Distribution System. Over 400 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	2.60 ppm	1.93–2.60 ppm	No	Water additive used to control microbes

BACTERIA IN TAP WATER – Tested throughout the Distribution System. Over 400 samples collected throughout the City each month						
	Highest Level Allowed (EPA's MCL)	Ideal Goal (EPA's MCL)	Highest Monthly % of Positive Samples	Monthly Range (% of Positive Samples)	Violation	Source
Total Coliform	No more than 5% of samples can test positive in a single month*	0	0.6%	0%–0.6%	No	Naturally present in the environment.
<i>E. coli</i>		0	0%	0%	No	Human or animal fecal waste.

*Every sample that is positive for total coliforms must also be analyzed for *E. coli*. If a system has two consecutive total coliform-positive samples, and one is also positive for *E. coli*, then the system has an MCL violation. There were no Level 1 or Level 2 assessments required under the Revised Total Coliform Rule in 2023.

TOTAL ORGANIC CARBON – Tested at Water Treatment Plants					
	Baxter WTP One Year Average	Belmont WTP One Year Average	Queen Lane WTP One Year Average	Violation	Source
Percent of Removal Required	25–45%	25–45%	25–45%	No	Naturally present in the environment.
Percent of Removal Achieved*	17–72%	20–74%	33–71%		
Number of Quarters out of Compliance*	0	0	0		

*PWD achieved TOC removal requirements in all quarters of 2023 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: 95% of samples must be at or below 0.300 NTU	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	0.099 NTU	0.180 NTU	0.153 NTU	No	

We are required to monitor your drinking water for specific contaminants on a regular basis. The results of this monitoring indicate 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. In calendar year 2023, on one occasion, continuous on-line turbidity monitoring was interrupted on one of our filters and therefore we cannot be sure of the quality of the drinking water from this filter during the interruption. On June 4th, 2023 Filter #2 at the Queen Lane Plant was found in service without turbidity monitoring for a period of 62.5 hours. The monitoring interruption was a result of a software upgrade on the turbidimeter controller that left the turbidimeter in hold mode creating an artificial steady turbidity reading, until operators recognized the data trend was not responding on June 4th, 2023. During this single filter monitoring interruption, the combination flow from the plant filters at Queen Lane Plant was continuously sampled and monitored with no change in turbidity levels. The software upgrade issue on the turbidimeter controller was later resolved by the manufacturer. No water quality emergency occurred due to the monitoring interruption, and this notice is for informational purposes only.

DISINFECTION BYPRODUCTS

	Highest Level Allowed (EPA's MCL) - One Year Average	Running Annual Average 2023*	System-Wide Range of Results	Violation	Source
Total Trihalomethanes (TTHMs)	80 ppb	52 ppb	17–91 ppb	No	Byproduct of drinking water disinfection
Total Haloacetic Acids (THAAs)	60 ppb	42 ppb	16–63 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 2023.

UNREGULATED CONTAMINANT MONITORING (UCMR)¹

Chemical	Testing Period	Average	Range
Bromide ²	1/14/2020	0.034 ppm	0–0.052 ppm
Total Organic Carbon (TOC) ²	1/14/2020	2.27 ppm	2.19–2.34 ppm
HAA5 Total ³	1/14/2020	21.3 ppb	14.8–31.3 ppb
HAA6Br Total ⁴	1/14/2020	7.1 ppb	3.8–10.3 ppb
HAA9 Total ⁵	1/14/2020	28.2 ppb	23.6–35.5 ppb
Manganese	1/15/2020	0.55 ppb	0–0.95 ppb

¹ Unless otherwise noted, samples were collected from finished water sampling locations.

² Bromide and TOC represent source water samples.

³ HAA5 Total - Dibromoacetic Acid, Dichloroacetic Acid, Monobromoacetic Acid, Monochloroacetic Acid, and Trichloroacetic Acid

⁴ HAA6Br Total - Bromochloroacetic Acid, Bromodichloroacetic Acid, Dibromoacetic Acid, Dibromochloroacetic Acid, Monobromoacetic Acid, and Tribromoacetic Acid

⁵ 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.

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

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.

SECONDARY MCLs: AESTHETIC IMPACTS IN TAP WATER					
	EPA's SMCL	Baxter WTP One Year Range	Belmont WTP One Year Range	Queen Lane WTP One Year Range	Violation*
Chloride	250 ppm	53–66 ppm	58–109 ppm	54–115 ppm	No
Copper	1.0 ppm	0.098–0.218 ppm	0.004–0.026 ppm	0.022–0.037 ppm	No
Fluoride	2 ppm**	0.66 ppm	0.83 ppm	0.73 ppm	No
Iron	0.3 ppm	0 ppm	0–0.012 ppm	0–0.010 ppm	No
pH	6.5–8.5	7.05–7.25	7.1–7.3	7.08–7.24	No
Sulfate	250 ppm	8.32–28.9 ppm	20.30–55.40 ppm	10.90–89.90 ppm	No
Total Dissolved Solids	500 ppm	128–242 ppm	200–374 ppm	194–396 ppm	No

PWD also monitored for Aluminum, Color, Manganese, and Silver in 2023; all results were below respective parameter detection limits.

*Individual results are averaged monthly and compliance is based on running annual average.

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

Sources of Secondary Chemicals						
Chloride	Copper	Fluoride	Iron	pH	Sulfate	Total Dissolved Solids
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.

Sodium, Hardness, and Alkalinity in tap water

The parameters listed on this page 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 One Year Average	Belmont WTP One Year Average	Queen Lane WTP One Year Average
Average (ppm)	21 ppm	42 ppm	34 ppm
Average (mg in 8 oz. glass of water)	5 mg	10 mg	8 mg
Range (ppm)	16–26 ppm	29–55 ppm	19–46 ppm
Range (mg in 8 oz. glass of water)	4–6 mg	7–13 mg	5–11 mg

HARDNESS IN TAP WATER

	Baxter WTP One Year Average	Belmont WTP One Year Average	Queen Lane WTP One Year Average
Average	90 ppm or 5 gpg	136 ppm or 8 gpg	154 ppm or 9 gpg
Minimum	78 ppm or 5 gpg	109 ppm or 6 gpg	82 ppm or 5 gpg
Maximum	105 ppm or 6 gpg	180 ppm or 11 gpg	206 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 "moderately hard" or "hard" depending on your service area.

ALKALINITY IN TAP WATER

	Baxter WTP One Year Average	Belmont WTP One Year Average	Queen Lane WTP One Year Average
Average	38 ppm	70 ppm	68 ppm
Minimum	26 ppm	52 ppm	33 ppm
Maximum	50 ppm	88 ppm	94 ppm

Photography

JPG Photo & Video



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