

2019 9 28 4 6 00 2 4



| D | R | I | N | K | I | N | G | water quality 1999

PWD is an active and proud member of:

American Water Works Association

American Water Works Association Research Foundation

Partnership for Safe Water

American Public Works Association

Association of Metropolitan Water Agencies

Association of Metropolitan Sewerage Agencies

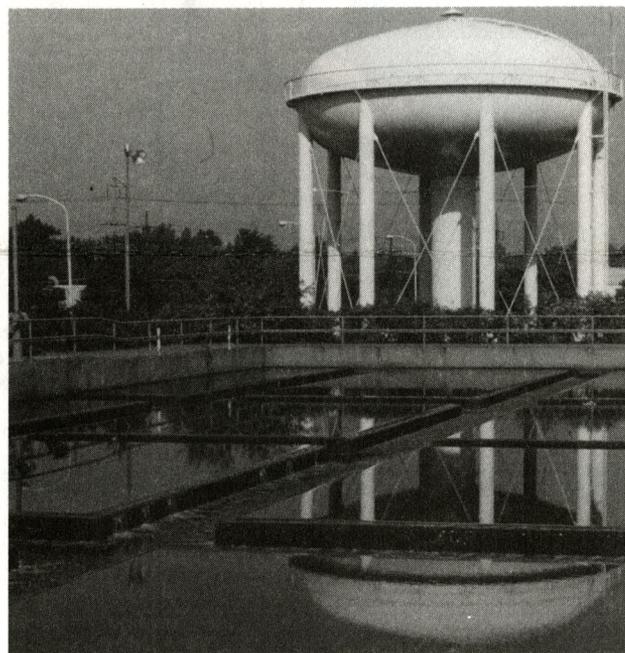
Water Environment Federation

Water Environment Research Foundation

The Philadelphia Water Department (PWD) is pleased to present our 1999 Water Quality Report. The good news is – your tap water is top quality. This report provides our customers with a summary of where Philadelphia's drinking water comes from, how it is treated to make it safe and healthy, and the results of water quality monitoring performed by us on a daily basis. The U.S. Environmental Protection Agency (EPA) requires all water utilities to produce and distribute water quality reports on an annual basis. This report, published in April 2000, includes water quality information for the 1999 calendar year.

Para obtener una copia del Informe sobre la Calidad del Agua más reciente publicado por el Departamento de Agua de Philadelphia, llame al (215) 685-6300.

We have consistently performed better than all drinking water standards developed by the EPA to protect public health. In fact, all of Philadelphia's drinking water plants were among the first in the nation to receive the EPA Director's Award in 1998 for meeting standards for excellence established under the Partnership for Safe Water program. How do we do this? We use proven treatment practices at our water treatment plants and we participate in groundbreaking research while keeping water rates among the lowest in the region. Our goal is to make our customers feel good about drinking the recommended eight glasses of water every day.



Where does Philadelphia's drinking water come from?

The water that we treat comes from the Schuylkill and Delaware rivers. Rivers are surface water supplies. Philadelphia does not use groundwater. Each river contributes approximately one-half of the City's overall supply. PWD has three water treatment plants that process untreated river water, to make water safe and healthy to drink. We produce approximately 300 million gallons of high-quality drinking water for our customers on a daily basis.

How do we treat the water to make it safe and healthy to drink?

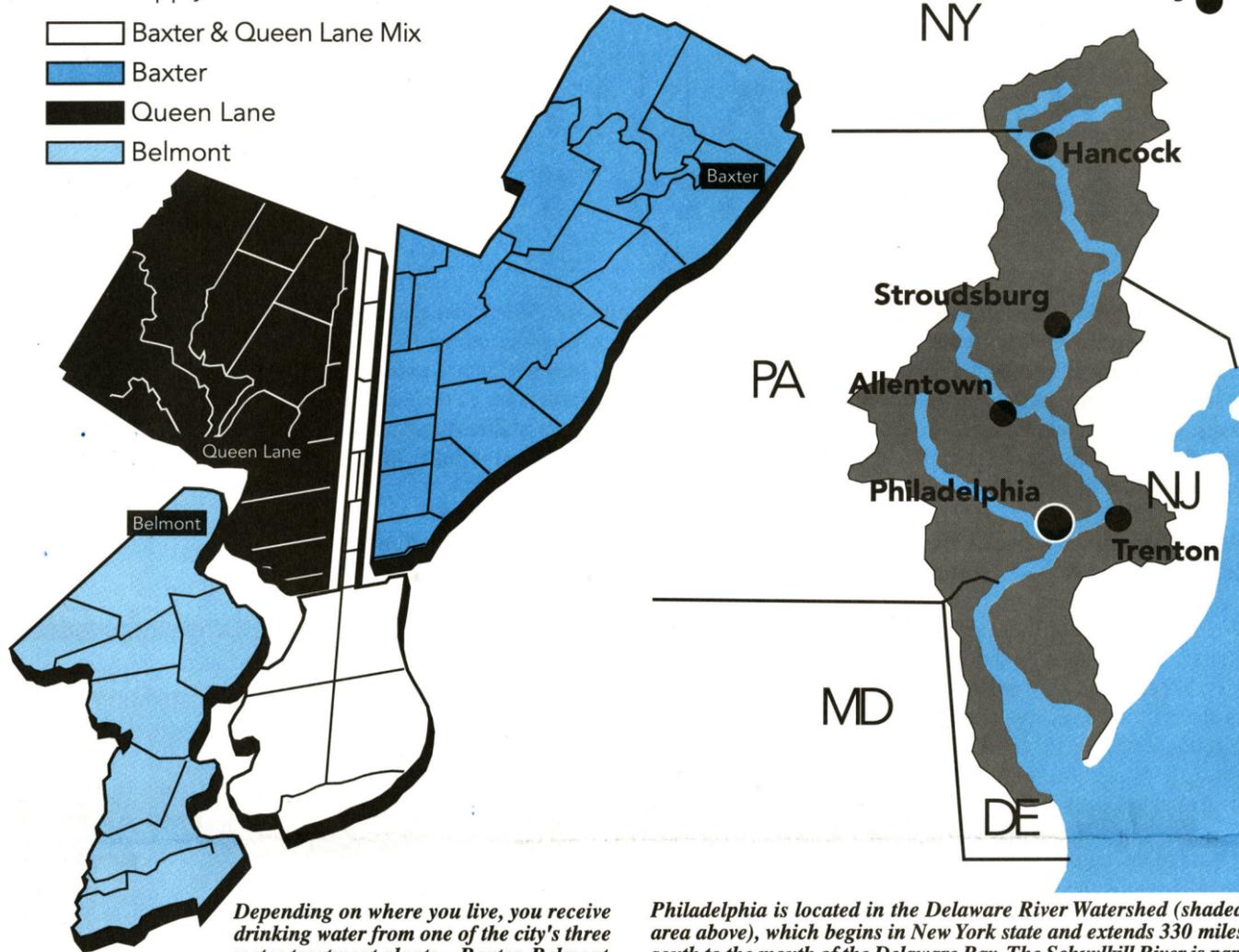
Like the majority of water utilities in the U.S., we use a multi-step treatment process at all three of our drinking water treatment plants. The Water Treatment Process diagram (page 3) provides a brief description of drinking water treatment in Philadelphia.

Philadelphia's water is safe and healthy to drink for most people. For people with special health concerns, please see the information on page 8.

Each 1999 Drinking Water Quality Report cost \$.07 to print and \$.21 to mail. PWD and other water utilities are required to mail this report to all our water and sewer customers.

Water Supply Districts

-  Baxter & Queen Lane Mix
-  Baxter
-  Queen Lane
-  Belmont



Depending on where you live, you receive drinking water from one of the city's three water treatment plants – Baxter, Belmont or Queen Lane.

Philadelphia is located in the Delaware River Watershed (shaded area above), which 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.

Why is chlorine used to disinfect the drinking water?

State and federal laws require the disinfection of all public water supplies. EPA and health agencies recognize that using chlorine is the most effective way to protect public health from disease-causing organisms that can be found in rivers and streams. Because chlorine can chemically react with natural materials in rivers to form disinfection byproducts such as Trihalomethanes, we have been adjusting our chlorine process over the years to reduce this chemical reaction. But we also ensure that the treated water that is distributed through the city's water mains to your homes has a "chlorine residual," which continues to protect your water against bacteria and other organisms on its journey to your home tap.

How do we test the water to assure its high quality?

We perform more than 350,000 tests annually at our three drinking water treatment plants to make sure the treatment processes are working as expected. In addition, our scientists, engineers and technicians analyze thousands of samples of tap water each year at our sophisticated testing laboratory. This water is collected from reservoirs and more than 65 locations throughout Philadelphia.

How do drinking water sources become polluted?

Across the nation, sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves

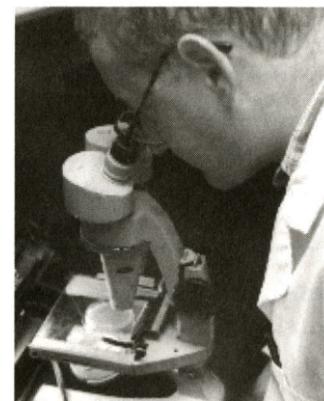
naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.
- Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production. They can also come from gas stations, urban storm water runoff (from streets and parking lots) and septic systems.
- Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

How do rivers become polluted?

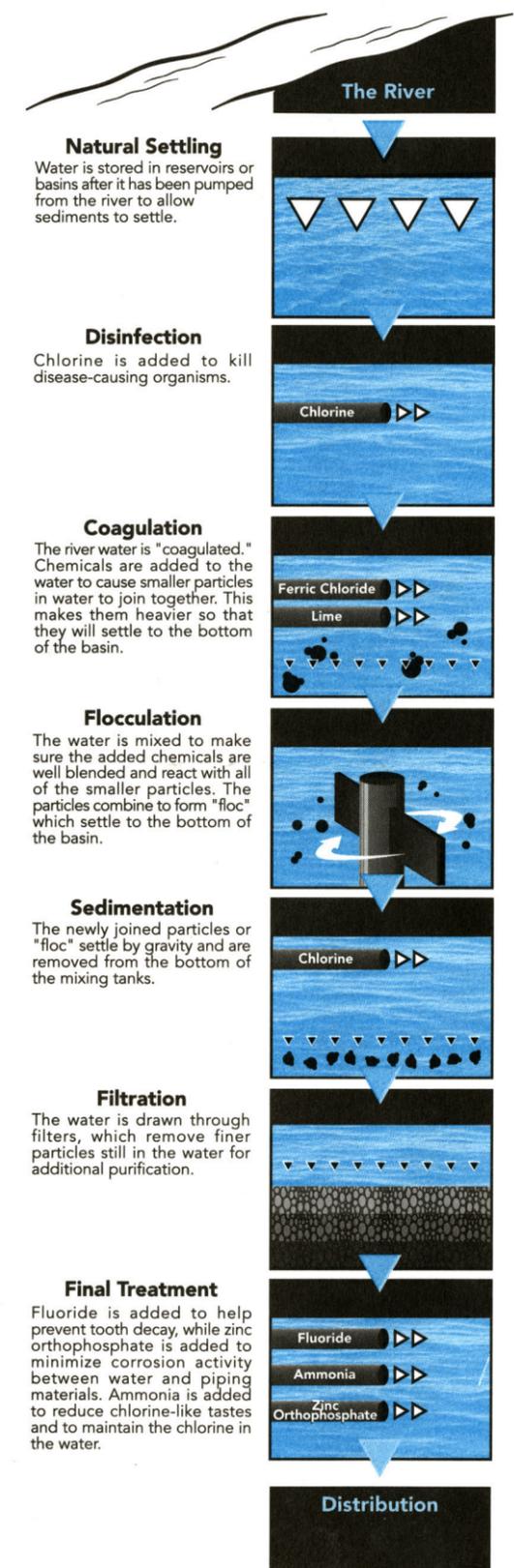
At their sources, the Delaware and Schuylkill rivers are generally clean rivers. But as the rivers flow downstream, they pick up contaminants from many sources – storm water runoff washes pollutants on the land into the rivers, and communities and industries discharge used water back into the rivers. However, we carefully safeguard our urban water supply through a variety of practices and research projects designed to protect our rivers and watersheds. For information about these programs, or to get involved in source water protection activities, call 215-685-6300. For information about the quality of our region's rivers and streams, call the Pennsylvania Department of Environmental Protection at 610-832-6000 or check their website (<http://www.dep.state.pa.us>).

Safeguarding the water you drink.



In order to ensure that tap water is safe to drink, the Environmental Protection Agency has regulations that limit the amount of certain contaminants in water provided by water suppliers. The Food and Drug Administration establishes limits for contaminants in bottled water which must provide the same level of safety. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants

DRINKING water treatment process



Each water sample undergoes a series of tests to ensure that our customers enjoy safe water, that meets or exceeds state and federal standards.

(continued on page 6)

DRINKING water quality results

We are pleased to report our 1999 Drinking Water Quality Results. All results are below the maximum recommended levels designed to protect public health. Please see the glossary for definitions of the abbreviations in the tables.

Metals - Tested at Customers' Taps

	EPA's Action Level for representative sampling of customer homes	Ideal Goal (EPA's MCLG)	90% of PWD customers' homes were less than	No. of homes considered to have elevated levels	Source
Lead	90% of homes must test less than 15 ppb	0	9 ppb	4 out of 59	Corrosion of household plumbing
Copper	90% of homes must test less than 1.3 ppm	1.3 ppm	0.3 ppm	0	Corrosion of household plumbing

Disinfection Byproducts in Tap Water

	Highest Level Allowed (EPA MCL) One Year Average	Ideal Goal (EPA's MCLG)	Baxter WTP One Year Average	Belmont WTP One Year Average	Queen Lane WTP One Year Average	Source
Total Trihalomethanes (TTHMs)	100 ppb	0	57 ppb Range of individual test results: 41 - 88	64 ppb Range of individual test results: 35 - 119	49 ppb Range of individual test results: 34 - 85	Byproduct of drinking water chlorination

Bacteria in Tap Water

	Level Allowed (EPA MCL)	Ideal Goal (EPA's MCLG)	Highest Monthly Result	Source
Total Coliform Bacteria	Presence of coliform bacteria in 5% or less of more than 360 monthly samples	0	Highest % of positive samples: 0.4%	Naturally present in the environment Their presence indicates potential contamination

NOTE: All of the samples with Total Coliforms tested negative for E. Coli

Other Chemicals in Tap Water - PWD monitors annually though only required to monitor every nine years

	Highest Level Allowed (EPA MCL)	Ideal Goal (EPA MCLG)	Highest Results at a WTP	Range of Test Results for the Year	Source
Nitrate	10 ppm	10 ppm	4.9 ppm at Queen Lane	1.6 - 4.9 ppm	Fertilizer runoff; sewage

Clarity Characteristics - Tested at Water Treatment Plants

Turbidity (measure of clarity)	Water Treatment Plant	Treatment Technique Requirement	Highest Single Value for the Year	Source
	Baxter	95% of samples must be at or below 0.50 ntu	0.21 ntu	Soil runoff; river sediment
	Belmont	95% of samples must be at or below 0.50 ntu	0.15 ntu	Soil runoff; river sediment
	Queen Lane	95% of samples must be at or below 0.50 ntu	0.14 ntu	Soil runoff; river sediment

NOTE: PWD achieved turbidity limits 100% at all times tested

Hardness (as Calcium Carbonate)	Water Treatment Plant	Annual Average	Annual Minimum	Annual Maximum
	Baxter	100 ppm	77 ppm	126 ppm
	Belmont	179 ppm	139 ppm	235 ppm
	Queen Lane	178 ppm	140 ppm	231 ppm
Alkalinity (as Calcium Carbonate)	Baxter	39 ppm	20 ppm	52 ppm
	Belmont	65 ppm	39 ppm	95 ppm
	Queen Lane	68 ppm	24 ppm	100 ppm

Other Chemicals in Tap Water

(chemicals without regulatory goals but monitoring was required)

Chemical	Average	Range of Test Results for the Year
Sulfate	42 ppm	15 - 86 ppm
Sodium	26 ppm	9 - 64 ppm
Bromodichloromethane	19 ppb	6.1 - 38 ppb
Bromoform	1.7 ppb	0 - 13 ppb
Chlorodibromomethane	11.1 ppb	0.7 - 41 ppb
Chloroform	43.2 ppb	16 - 57 ppb

NOTE: We conducted monitoring for these chemicals throughout the year, although federal regulations do not require it. The four chemicals, other than sulfate and sodium, are the TTHMs.

Organic Chemicals for Future Regulation - Levels in Tap Water

	Average	Range	EPA's Future Regulation
THAAs	42.0 ppb	21.6 - 102.2 ppb	60 ppb

Total Chlorine Residual

(Over 400 samples collected throughout the city every month)

Total Chlorine	EPA Maximum Residual Disinfectant Level	Maximum Monthly Range
	4.0 ppm	2.1 ppm

Chemicals for Future Regulation

(Monitored July 1997 - December 1998 per Information Collection Rule)

Chemicals	Average for Philadelphia	Highest Single Value
Total Trihalomethanes (TTHMs)	64.8 ppb	87.2 ppb
Total Haloacetic Acids (THAAs)	36.6 ppb	63.0 ppb
Haloacetonitriles	8.2 ppb	16.2 ppb
Haloketones	2.8 ppb	4.9 ppb
Chloropicrin	1.1 ppb	1.9 ppb
Chloral Hydrate	6.7 ppb	13.6 ppb
Total Organic Halides	161.0 ppb	235.0 ppb
Cyanogen Chloride	4.2 ppb	8.6 ppb
Chlorate	147.8 ppb	306.6 ppb

GLOSSARY

Action Level

The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which 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 process.

Cyanogen Chloride

A disinfection byproduct related to the use of chloramine. In Philadelphia, we use chloramine (a combination of chlorine and ammonia) in the distributed water because it is less corrosive and longer lasting than chlorine. There is very little information about this byproduct and regulations are not planned yet.

Chlorate

A byproduct of chlorine resulting from the use of liquid chlorine bleach. Regulations are not yet planned.

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.

ntu - nephelometric turbidity units

Turbidity is measured with an instrument called a nephelometer. Measurements are given in nephelometric turbidity units.

ppb - part per billion

One part per billion is equivalent to one green apple in a barrel with 999,999,999 red apples.

ppm - part per million

One part per million is equivalent to one green apple in a barrel with 999,999 red apples.

Total Coliform

Coliforms are bacteria which are naturally present in the environment and are used as an indicator that other potentially harmful bacteria may be present.

THAAs - Total Haloacetic Acids

A group of chemicals called disinfection byproducts, which form during chlorination. They will be regulated in the future. Similar, but unregulated byproducts include: haloacetonitriles, haloketones, chloropicrin, chloral hydrate and total organic halides.

TOC - Total Organic Carbon

A measure of the carbon content of organic matter. The measure provides an indication of how much organic material in the water could potentially react with chlorine to form THAAs and TTHMs.

TTHMs - Total Trihalomethanes

A group of chemicals called disinfection byproducts, which form during chlorination. TTHMs form when natural organic matter in the rivers, e.g., leaves and algae, decompose and combine chemically with the chlorine added for disinfection. Levels of TTHMs vary seasonally.

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 how we remove particles that cannot be seen by the human eye.

WTP - Water Treatment Plant

(continued from page 3)

and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline (800-426-4791) or from their website (<http://www.epa.gov/safewater>).

What do we look for?

In addition to the contaminants that appear in our charts, we look for over 100 other contaminants that were not found at reportable levels. These include: arsenic, antimony, beryllium, cyanide, thallium, cadmium, mercury, nickel, selenium, benzene, carbon tetrachloride, p-dichlorobenzene, 1,2-dichloroethane, trichloroethylene, 1,1,1-trichloroethane, 1,2,4-trichlorobenzene, 1,1,2-trichloroethane, total xylenes, dichloromethane, chlorobenzene, o-dichlorobenzene, c-1,2-dichloroethylene, t-1,2-dichloroethylene, 1,2-dichloropropane, ethyl benzene, styrene, tetrachloroethylene, toluene, simazine, di(2-ethylhexyl)adipate, di(2-ethylhexyl)phthalate, endothall, hexachlorocyclopentadiene, oxamyl, pichloram, benzo(a)pyrene, alachlor, atrazine, carbofuran, chlordane, dibromochloropropane, ethylene dibromide, lindane, methoxychlor, and pentachlorophenol.

Taste and Odor

We also test for aluminum, chloride, color, iron, manganese, silver, pH, sulfate, total dissolved solids, and zinc to ensure that tap water meets all water quality taste and odor guidelines.

Waived Requirements

The Pennsylvania Department of Environmental Protection has waived requirements to test for the following elements as they are not expected to occur in drinking water in this area (although we still test for these periodically): nitrite, asbestos, dalapon, dinoseb, dioxin, diquat, endrin, glyphosate, hexachlorobenzene, 2,4-D, PCBs, toxaphene, 2,4,5-TP, heptachlor, heptachlor epoxide and vinyl chloride. Radon is waived, as it is associated with groundwater. Radium is tested for only if other radiological elements exceed an action level.

Unregulated Chemicals

The following chemicals are unregulated, and the Environmental Protection Agency required monitoring for these to gather information about their occurrence. None of these was found at reportable levels when we last tested for them in 1997: bromobenzene, bromomethane, chloroethane, o-chlorotoluene, p-chlorotoluene, dibromomethane, m-dichlorobenzene, 1,1-dichloroethane, 2,2-dichloropropane, 1,3-dichloropropane, 1,1-dichloropropene, 1,3-dichloropropene, 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, 1,2,3-trichloropropane.

The following chemicals are unregulated, and the Environmental Protection Agency required monitoring for these to gather information about their occurrence. None of these was found at reportable levels when last tested in the fall of 1995: aldicarb, aldicarb sulfone, aldicarb sulfoxide, carbaryl, dicamba, 3-hydroxycarbofuran, methomyl, metolachlor, metribuzin, propachlor. Aldrin, butachlor and dieldrin were waived from monitoring in Pennsylvania.



Lead in Drinking Water

The Philadelphia Water Department has a permit with the Pennsylvania Department of Environmental Protection for operating under optimized corrosion control. Under this permit, the Water Department maintains the pH of water between 7.0 and 7.8 and maintains the amount of orthophosphate at greater than 0.10 mg as phosphorus.

Although water in our distribution system does not contain lead, you need to be aware of the possibility that lead materials in your home plumbing could leach into your drinking water. Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels in your home may be higher than levels in other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested. In the meantime, flush your tap for 30 seconds to two minutes before using tap water to get fresh water from the city's water mains. Additional information is available from the Environmental Protection Agency's Safe Drinking Water Hotline 800-426-4791.

Research and Monitoring for Cryptosporidium and Giardia

Cryptosporidium and *Giardia* are microscopic organisms. When ingested, they can result in diarrhea, fever and other gastrointestinal symptoms. The organisms are found in animal wastes and sewage and are washed into rivers and streams

when it rains. The best defense against these organisms is an effective water treatment process; most importantly, filtration.

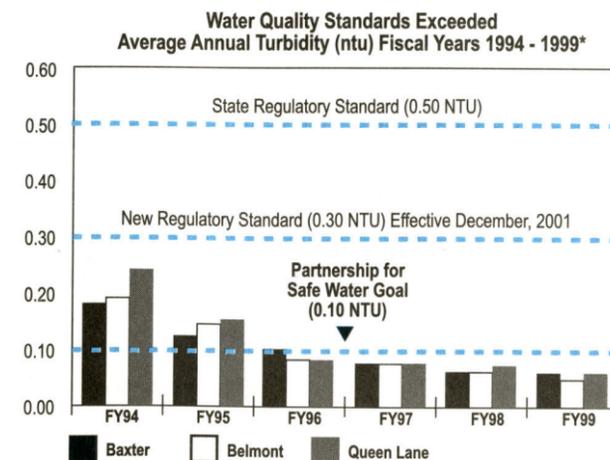
We presently produce drinking water that is eight to 10 times better than the national and state standards. See graph below.

This means that tiny particles – particles the same size as these organisms and smaller than particles visible to the human eye – are being successfully removed from our water.

The Philadelphia Water Department is one of the nation's leaders in *Cryptosporidium* research and was one of the first utilities in the U.S. to monitor for the organism. Continual research is being performed by us to discover better testing methods, to determine the sources of these parasites in our rivers, and to ensure that our treatment practices to protect our drinking water. In 1998, 44 tests conducted on our treated drinking water did not detect either *Giardia* or *Cryptosporidium*. Eighty-one percent of the samples of untreated water taken from the rivers were positive for *Giardia* and only 40 percent were positive for *Cryptosporidium*. These tests were conducted on river water samples drawn at our plants' intakes (the locations where we pump the river water to our settling reservoirs). We are also working closely with the Philadelphia Department of Public Health to ensure that our tap water is free of pathogens that can be found in rivers.

Partnership for Safe Water

In January 1996, the Philadelphia Water Department signed an agreement to join the national Partnership for Safe Water, a joint program of the EPA and the drinking water industry. Following Partnership guidelines, we are evaluating each of our treatment plant processes to identify further improvements in practices that are already far more rigorous than required by state or federal law. For example, we have cut turbidity of the City's finished drinking water significantly. The Partnership for Safe Water program established a goal of 0.10 ntu (total running average), well below the state's regulatory standard of 0.30 ntu that will become effective in December 2001. In 1996, we were meeting this goal at all three of our treatment plants. During 1998, all three plants performed better than the goal set by the Partnership. Today, all three plants continue to lower their ntu levels, achieving a total running average of 0.06 ntu, which means that we have successfully achieved the turbidity limits 100 percent of all times tested.



Tap Water VS Bottled Water

Did you know that tap water is just as healthy as commercially bottled water? And tap water is generally tested more often for safety. In fact, much bottled water actually comes from municipal taps. Further, tap water is only a fraction of the cost of water in a bottle – less than 1/10 of one cent for every gallon. For optimal taste, we recommend that you fill pitchers of water and place them in your refrigerator. Many customers find that they enjoy chilled water best.



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 or other immune system disorders, some elderly and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. Environmental Protection Agency/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline 800-426-4791.

Interesting Facts About Philadelphia's Water

Fluoride

The Philadelphia City health code has required the Water Department to add fluoride to its treated water since 1954. Approximately 1 milligram per liter (mg/L), or 1 part per million (ppm), of fluoride is added, which is the amount recommended by the American Dental Association to provide maximum dental protection.

Hardness

Hardness defines the quantity of minerals such as calcium and magnesium in a gallon of 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. Hardness also affects other water qualities such as its corrosiveness, with soft water being more corrosive.

Temperature

The temperature of both the Schuylkill and Delaware rivers varies seasonally from approximately 33° to 85° F. The Water Department does not treat the water for temperature.

Cloudy Water

Aeration is the process which takes place when the water flowing from your tap into your glass appears cloudy. This temporary condition is a result of dissolved air being released from the water and being temporarily suspended in the water in your glass. This most commonly happens in the winter time when the cold water in the water mains is warmed up quickly in household plumbing, thereby encouraging the dissolved air to come out of the water.

Clean Water Starts With You

Always recycle or dispose of unwanted household hazardous wastes properly. Don't pour motor oil, antifreeze or other toxic materials down storm drains. Also, don't flush paint thinners,

insect sprays, herbicides and other harmful chemicals down the sink. Contact the Streets Department to get a schedule of their Household Hazardous Materials Drop-off Events where you can dispose of these materials safely without polluting your drinking water supply.

We Welcome Your Ideas and Opinions

We participate in over 200 public and community events a year, including presentations made at schools, ongoing educational programs, summer camps conducted at the Fairmount Water Works Interpretive Center, host annual open houses and other environmental celebrations. We also offer tours of our facilities and the city's watersheds. We greatly benefit from a number of community advisory committees that have been working with us over the last few years to improve our communications with our customers. Citizens representing business and industry, education, environmental advocacy, senior citizens, regulatory agencies and civic and community groups have assisted us in developing public information about a variety of topics, including drinking water quality and storm water pollution prevention.

How to Contact Us

Interested citizens are welcome to attend our Drinking Water Quality Communications Citizen Advisory Committee meetings, which take place on the third Tuesday of every month, from 9 a.m. to 11 a.m. at 1101 Market Street, 5th Floor Conference Room, Philadelphia, PA.

You can write to us at:

The Philadelphia Water Department
ARAMark Tower
1101 Market Street, 3rd Floor
Philadelphia, PA 19107-2994

You can call our Customer Information Hotline at 215-685-6300.

You can e-mail us at waterquality@phila.gov.

For additional information about this report, about our source water protection initiatives and how to get involved in them or about PWD services or programs, call 215-685-6300.

Important Telephone Numbers and Internet Addresses

Philadelphia Water Department
215-685-6300 <http://www.phila.gov/departments/water>

Philadelphia Streets Department
215-686-5560 <http://www.phila.gov/departments/streets>

U.S. Environmental Protection Agency
(Safe Drinking Water Hotline)
800-426-4791 <http://www.epa.gov/safewater>

PA Department of Environmental Protection
610-832-6000 <http://www.dep.state.pa.us>