

# 2016 Water Quality Report

*Charleston Water System's drinking water met or exceeded all quality standards in 2016*

This report provides information about where your drinking water comes from, how it's treated, and the results from quality testing in 2016. For more information, visit [www.charlestonwater.com](http://www.charlestonwater.com).

**Our Mission** is to protect public health and the environment of our service community by providing clean water services of exceptional quality and value.

**Our Vision** is to become by the year 2017, our 100<sup>th</sup> anniversary, an organization worthy of the Malcolm Baldrige National Quality Award for our customers, our community, and our future.



CELEBRATING A CENTURY OF SERVICE  
1917-2017



## About Charleston Water System

Charleston Water System is a publicly owned water and wastewater utility. We provide clean drinking water to more than 400,000 people in the Greater Charleston area, including direct retail service to 115,000 homes and businesses and wholesale water service to neighboring utilities and municipalities.

Our legal name is the *Commissioners of Public Works of the City of Charleston*, but we do business using the name *Charleston Water System*. Our public water system identification number is 1010001.

## Where Your Water Comes From

Charleston Water System's drinking water comes from two surface water sources: The Bushy Park Reservoir in Berkeley County (our primary source) and the Edisto River in Dorchester County. Deep tunnels carry water from these sources to our Hanahan Water Treatment Plant. Together, these sources provide a plentiful supply of water, even during severe drought.

## The Treatment Process

At the treatment plant, the water goes through several processes to make it clean and safe to drink.

First, food-grade alum is mixed into the water. This causes tiny suspended particles to clump together and form heavier particles called floc. When the water flows into sedimentation basins, the floc sinks to the bottom and is removed.

Next, the water flows through filters, which remove microscopic contaminants such as bacteria and microorganisms. Finally, the water is disinfected to protect against disease-causing organisms, the fluoride level is adjusted to protect dental health, and a corrosion inhibitor is added to prevent the corrosion of lead and copper that may be present in household plumbing.

## Water Distribution

After treatment, the clean water is pumped into the water distribution system, a network of nearly 2,000 miles of underground pipes ranging in size from two inches to four feet in diameter.

The distribution system includes dozens of pumps, four storage tanks, and some 9,000 fire hydrants. All of this must be monitored and maintained to provide high quality water at the right pressure to our customers.

### Possible Contaminants in Source Water

The sources of drinking water—for both tap water and bottled water—include rivers, lakes, streams, ponds, reservoirs, springs, and wells.

As water travels over the surface of land and into waterways, it dissolves naturally occurring minerals and can pick up substances from the presence of animals or human activity. Contaminants that may be present in source water include:

**Microbes**, such as viruses and bacteria, which may come from septic systems, agricultural livestock operations, and wildlife.

**Inorganic compounds**, such as salts and metals, which can be naturally occurring or the result of 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, runoff, and residential uses.

**Organic compounds**, including synthetic and volatile organics, which are by-products of industrial processes and petroleum production, can also come from gas stations, runoff, and septic systems.

**Radioactive compounds**, which can be naturally occurring or be the result of oil and gas production and mining activities.

To protect public health, water treatment plants reduce these contaminants to safe levels established by regulations.

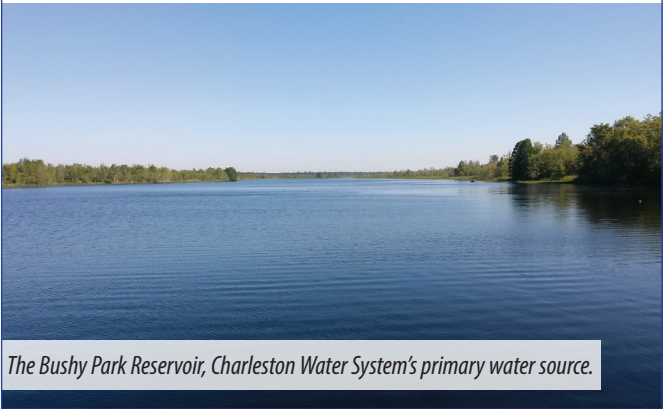
#### Source Water Protection

To raise awareness about the importance of preventing water pollution, the South Carolina Department of Health and Environmental Control (SCDHEC) has identified potential sources of contamination for each drinking water source in the state. Visit <http://www.scdhec.gov/HomeAndEnvironment/Water/SourceWaterProtection/> for additional information on source water protection.

#### How You Can Help

Stormwater runoff is a major source of pollution in our waterways.

- **Pick up the poop!** Pet waste pollutes waterways with bacteria and excess nutrients, which contribute to algae growth that can choke out plants and wildlife.
- **Don't over-fertilize your lawn.** Excess fertilizers and pesticides wash into storm drains and pollute streams.
- **No dumping in storm drains.** Storm drains collect rain water and empty directly into a waterway. Never pour anything into a storm drain.



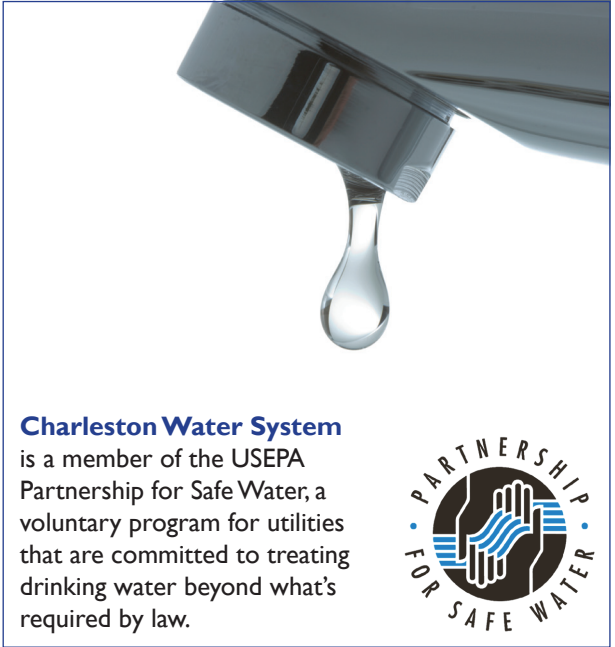
The Bushy Park Reservoir, Charleston Water System's primary water source.

### Tap Water Regulations

Charleston Water System meets or surpasses all drinking water standards and regulations established by the US Environmental Protection Agency (USEPA) and SCDHEC.

These regulations protect public health by setting legal limits on levels of potentially harmful contaminants in drinking water. 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 and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at 1-800-426-4791.

Descriptions of the compounds detected in Charleston's water and the EPA limits for each compound are listed in the table on the next page.



Charleston Water System is a member of the USEPA Partnership for Safe Water, a voluntary program for utilities that are committed to treating drinking water beyond what's required by law.

#### Water Quality Table Definitions

##### Maximum Contaminant Level Goal (MCLG)

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.

##### Maximum Contaminant Level (MCL)

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.

##### Action Level (AL)

The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements that a water system must follow.

##### Treatment Technique (TT)

A required process intended to reduce the level of a contaminant in drinking water.

##### Maximum Residual Disinfectant Level (MRDL)

The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

##### Maximum Residual Disinfectant Level Goal (MRDLG)

The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contamination.

### 2016 Water Quality Results

Charleston Water System met or surpassed all water quality requirements in 2016

Charleston Water System's drinking water was tested more than 20,000 times for over 150 substances and parameters in 2016. Of these, only those listed in the table below under the heading *Detected in Our Water* were found in our water, and all were detected at levels below the regulatory limit.

In addition to the detected substances, we are required to report the results for certain contaminants, such as *Cryptosporidium* and *Giardia*, even when none are detected.

	Constituent	Maximum Contaminant Level (MCL) set by EPA	Maximum Contaminant Level Goal (MCLG)	Actual Level in Charleston's Water for 2016	Possible Sources in Water
<b>Required Reporting</b>					
	<b>Turbidity</b> A measure of the amount of suspended particles in the water (cloudiness); an indicator of overall water quality and filtration effectiveness.	Requires a specific treatment technique (TT); 95% of monthly samples must be less than 0.3 NTU	N/A	0.11 NTU highest level detected 100% of monthly samples met the limit	Soil runoff
	<b>Cryptosporidium</b> A parasite spread through human and animal waste that causes gastrointestinal illness.	No MCL; EPA requires specific treatment techniques (TT)	Zero <i>Cryptosporidium</i> oocysts per 1 liter of water	Zero <i>Cryptosporidium</i> oocysts per 1 liter of water	Human and animal sources
	<b>Giardia</b> A parasite spread through human and animal waste that causes gastrointestinal illness.	No MCL; EPA requires specific treatment techniques (TT)	Zero <i>Giardia</i> cysts per 1 liter of water	Zero <i>Giardia</i> cysts per 1 liter of water	Human and animal sources
<b>Detected in Our Water</b>					
Inorganic Compounds	<b>Copper</b> A metal widely used in household plumbing that may corrode into water.	90th percentile of all samples collected must be less than the 1.3 ppm action level (AL)	1.3 ppm	0.06 ppm* (No samples exceeded the action level) Range: 0 to 0.12 ppm	Corrosion of household plumbing materials
	<b>Lead</b> A metal no longer used in water pipes, but may be present in plumbing fixtures or old pipes; may corrode into water.	90th percentile of all samples collected must be less than the 15 ppb action level (AL)	0 ppb	90th percentile = 1.3 ppb* (No samples exceeded the action level) Range: 0 to 3.1 ppb	Corrosion of household plumbing materials
	<b>Nitrate/Nitrite</b> Nitrates and nitrites are nitrogen-oxygen compounds that can become a source of pollution in the form of unwanted nutrients.	10 ppm	10 ppm	0.09 ppm	Runoff from fertilizers
	<b>Fluoride</b> A substance that is naturally occurring in some water sources, particularly groundwater. It is also added to drinking water to help prevent tooth decay.	4 ppm	4 ppm	0.16 ppm in source water 0.53 ppm in finished water Range: 0.10 to 0.53 ppm	Naturally occurring in source water and adjusted during treatment to prevent tooth decay.
Disinfectants	<b>Chlorine Dioxide</b> A disinfection agent added in small amounts to protect against microbes.	800 ppb	800 ppb	200 ppb Range: 0 to 200 ppb	Added for disinfection
	<b>Chloramine Residual</b> A compound of chlorine and ammonia that is added in small amounts to treated water to protect against microbes.	4 ppm MRDL	4 ppm MRDLG	2.72 ppm running annual average (RAA) Range: 2.2 – 3.0 ppm	Added for disinfection
Disinfection Byproducts	<b>Total Trihalomethanes (Stage 2)</b> Stage 2 of the Disinfectants and Disinfection Byproducts Rule requires the locational running annual average (LRAA) for each sampling location to be below the MCL. CWS has eight sampling locations.	Locational Running Annual Average (LRAA) must be below 80 ppb	N/A	RAA: 18 ppb Range: 6.43 – 21.59 ppb	Byproduct of disinfection
	<b>Total Haloacetic Acids (Stage 2)</b> Stage 2 of the Disinfectants and Disinfection Byproducts Rule requires the locational running annual average (LRAA) for each sampling location to be below the MCL. CWS has eight sampling locations.	Locational Running Annual Average (LRAA) must be below 60 ppb	N/A	RAA: 27 ppb Range: 9.44 – 42.40 ppb	Byproduct of disinfection
	<b>Chlorite</b> A byproduct formed when chlorine dioxide is used to disinfect water.	1 ppm	0.8 ppm	0.74 ppm Range: 0.42 – 0.74 ppm	Byproduct of disinfection
Organic Compounds/Bacteria	<b>Total Organic Carbon (TOC)</b> The measure of organic substances in a body of water, mostly from naturally occurring sources such as plant material. TOC provides a measurement for the potential formation of disinfection byproducts.	No MCL; EPA requires a specific treatment technique (TT). % removal requirement varies from 35% - 55% TOC removal, depending on source water quality	N/A	Removal ratio RAA = 1.39 Range: 55% to 75% removal Range: 1.8 – 2.7 ppm TOC	Naturally present in the environment
	<b>Total Coliform Bacteria</b> A group of bacteria whose presence in water indicates possible contamination with soil or waste from warm blooded animals.	Presence of coliform bacteria greater than or equal to 5% of monthly samples	0%	1.8% highest % of positive monthly samples Range: 0 – 1.8% All repeat samples were satisfactory	Naturally present in the environment
*Results are from 2015. EPA requires testing for copper and lead once every three years.					
<b>Abbreviations:</b> ppm: Parts per million (mg/L) ppb: Parts per billion (ug/L)		RAA: Running Annual Average NTU: Nephelometric Turbidity Units	LRAA: Locational Running Annual Average		

## Water Characteristics

The parameters in the table below affect the aesthetics of drinking water, such as taste, odor, hardness, etc. The USEPA has established secondary standards for some of these parameters, which are non-enforceable, recommended guidelines.

Parameter	CWS Water Average 2016	Highest Level Recommended by USEPA
Chloride	15 ppm	250 ppm
Color	3 PCU	15 PCU
Iron	<0.10 ppm	0.3 ppm
Manganese	<0.05 ppm	0.05 ppm
Total Dissolved Solids (TDS)	102 ppm	500 ppm
Sodium	10 ppm	No Standard
Alkalinity	28 ppm	
Conductivity	177 umhos/cm	
Hardness	57 ppm (3.33 gpg)	
Ortho-phosphate	1.1 ppm	
Silica	5.6 ppm	
Temperature	71.6° F (22° C)	
<b>Abbreviations:</b> ppm: Parts per million	gpg: Grains per gallon PCU: Platinum Cobalt Units	

## A Message from the US Environmental Protection Agency

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as persons with HIV/AIDS or other immune system disorders, persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, some elderly and some infants can be particularly at risk from infections.

These people should seek advice from their health care providers. EPA/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 (1-800-426-4791).

## See the water treatment process in action



Scan the QR code with your smart phone or visit [www.charlestonwater.com/watervideo](http://www.charlestonwater.com/watervideo) to watch a video about water treatment.

 [www.youtube.com/user/CharlestonWater](https://www.youtube.com/user/CharlestonWater)



## Lead and Drinking Water

Lead is a metal that can cause serious health problems at elevated levels of exposure, especially for pregnant women and young children.

Although the most common exposure is by swallowing or breathing in lead paint chips and dust, lead can also enter tap water by corrosion of plumbing materials. Homes built before 1986 are more likely to have lead pipes, fixtures and solder.

To minimize this corrosion of lead into water, Charleston Water System adjusts the properties of our water to inhibit the chemical reaction that causes lead to leach into water from plumbing.

As an extra precaution, you can minimize the potential for lead exposure by flushing out water that has been sitting in your home's plumbing for several hours or more. This is especially important if you have been away from your home for several days. Just let your water run for up to two minutes before using it for cooking or drinking.

Charleston Water System offers free lead tests. You can pick up a testing kit at our office locations: 103 St. Philip Street, Downtown, and 6296 Rivers Avenue, North Area. For more information about lead, call the Safe Drinking Water Hotline or visit [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).

## Get Involved

Charleston Water System is governed by a board of elected Commissioners, which meets monthly. These meetings are open to the public, and citizen participation is welcomed. Meetings are typically held the fourth Tuesday of every month at 9 a.m. at 103 St. Philip Street. For more information, visit [www.charlestonwater.com](http://www.charlestonwater.com).

## About This Report

This report is produced annually and posted on our web site by June 1<sup>st</sup>. For more information, or to request hard copies, call us at (843) 727-6800, email [customerservice@charlestoncpw.com](mailto:customerservice@charlestoncpw.com), or visit one of our office locations:

Downtown  
103 St. Philip Street

North Charleston  
6296 Rivers Avenue

Este informe contiene información muy importante sobre su agua beber. Tradúzcalo ó hable con alguien que lo entienda bien.

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