

2012 Water Quality Report

May 2013



Cheers to clean drinking water!

Charleston Water System associates Eric, Stefanie, and Julius at the Hanahan Water Treatment Plant.

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 100th anniversary, an organization worthy of the Malcolm Baldrige National Quality Award for our customers, our community, and our future.



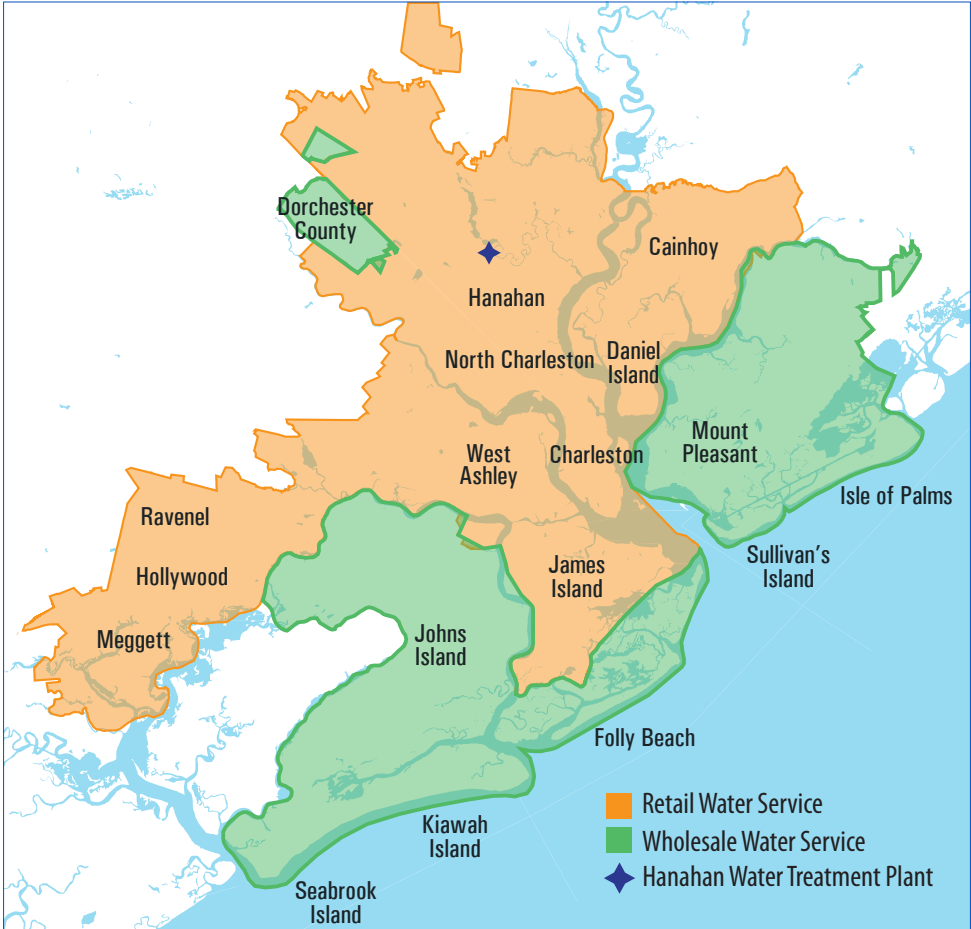
**Charleston
Water System**

Clean Water for Life

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 110,000 accounts 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 a 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, and the fluoride level is adjusted to protect dental health.

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 one inch to four feet in diameter.

The distribution system includes dozens of pumps, four storage tanks, and some 8,700 fire hydrants. All of this must be monitored and maintained to provide high quality water at the right pressure to the 110,000 homes and businesses served by Charleston Water System.

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:

Biological compounds, 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 remove these contaminants to safe levels established by regulations.



Source Water Protection

To raise awareness about the importance of preventing water pollution, the SC Department of Health and Environmental Control (SCDHEC) has identified the potential sources of contamination for each drinking water source in the state. You can view the source water assessment report for Charleston Water System on SCDHEC's web site at www.scdhec.gov/environment/water/srcewtr.htm.

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.



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 is required by law.



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 to the right.

2012 Water Quality Results

Charleston Water System met or surpassed all water quality requirements in 2012

Charleston Water System's drinking water was tested more than 20,000 times for 150 substances and parameters in 2012. Of these, only those listed in the table below under the heading *Detected in Our Water* were found

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.

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.

	Constituent	Maximum Contaminant Level (MCL) set by EPA	Maximum Contaminant Level Goal (MCLG)	Actual Level in Charleston's Water for 2012	Possible Sources in Water
Required Reporting					
	Turbidity 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	None	0.15 NTU highest level detected 100% of monthly samples met the limit	Soil runoff
	Cryptosporidium A parasite spread through human and animal waste that causes gastrointestinal illness.	No MCL; EPA requires specific treatment techniques (TT)	None	Zero <i>Cryptosporidium</i> oocysts per 1 liter of water	Human and animal sources
	Giardia A parasite spread through human and animal waste that causes gastrointestinal illness.	No MCL; EPA requires specific treatment techniques (TT)	None	Zero <i>Giardia</i> cysts per 1 liter of water	Human and animal sources
Detected in Our Water					
Inorganic Compounds	Copper A metal widely used in household plumbing that may corrode into water. <i>Results are from 2012. EPA requires testing for copper every three years.</i>	90th percentile of all samples collected must be less than the 1.3 ppm action level (AL)	1.3 ppm	0.11 ppm (no samples exceeded the action level) Range: 0 to 0.11 ppm	Corrosion of household plumbing materials
	Lead A metal no longer used in water pipes, but may be present in plumbing fixtures or old pipes; may corrode into water. <i>Results are from 2012. EPA requires testing for lead every three years.</i>	90th percentile of all samples collected must be less than the 15 ppb action level (AL)	0 ppb	90th percentile = 2.3 ppb (one sample exceeded the action level) Range: 0 to 17 ppb	Corrosion of household plumbing materials
	Nitrate/Nitrogen Nitrates and nitrites are nitrogen-oxygen compounds that can become a source of pollution in the form of unwanted nutrients.	10 ppm	10 ppm	0.52 ppm	Runoff from fertilizers
	Fluoride 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	0.19 ppm in source water 0.69 ppm in finished water*	Naturally occurring in source water and adjusted during treatment to prevent tooth decay.
Disinfectants	Chlorine Dioxide A disinfection agent added in small amounts to protect against microbes.	800 ppb	800 ppb	210 ppb Range: 0 to 210 ppb	Added for disinfection
	Chloramine Residual 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	3.08 ppm running annual average (RAA) Range: 3.0 – 3.3 ppm	Added for disinfection
Disinfection Byproducts	Total Trihalomethanes (TTHMs) A group of chemicals formed when chlorine used to disinfect drinking water reacts with naturally occurring organic and inorganic matter in the water.	80 ppb	N/A	22 ppb running annual average (RAA)** Range: 17.5 – 19.5 ppb***	Byproduct of disinfection
	Total Trihalomethanes (Stage 2) Stage 2 of the Disinfectants and Disinfection Byproducts Rule requires the average TTHM level for each sampling location to be below the MCL. CWS has eight sampling locations.	80 ppb	N/A	Range: 5.8 – 31.8 ppb****	Byproduct of disinfection
	Total Haloacetic acids (HAAs) A group of chemicals formed when chlorine used to disinfect drinking water reacts with naturally occurring organic and inorganic matter in the water.	60 ppb	N/A	17 ppb running annual average (RAA)** Range: 10 – 11 ppb***	Byproduct of disinfection
	Total Haloacetic acids (Stage 2) Stage 2 of the Disinfectants and Disinfection Byproducts Rule requires the average HAA level for each sampling location to be below the MCL. CWS has eight sampling locations.	60 ppb	N/A	Range: 0 to 18.83 ppb****	Byproduct of disinfection
	Chlorite A byproduct formed when chlorine dioxide is used to disinfect water.	1 ppm	0.8 ppm	0.79 ppm Range: 0.01 – 0.79 ppm	Byproduct of disinfection
Organic Compounds/ Bacteria	Total Organic Carbon (TOC) 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	Range: 45% to 70% removal 45% is required Removal ratio RAA = 1.27 TOC values 1.7 – 4.2 ppm TOC sampled daily	Naturally present in the environment
	Total Coliform Bacteria A group of bacteria whose presence in water indicates possible contamination with soil or waste from warm blooded animals.	Presence of coliform bacteria in no more than 5% of monthly samples	0%	1.9% highest % of positive monthly samples Range: 0 – 1.9% All repeat samples were satisfactory	Naturally present in the environment
<p>*Finished water fluoride was <0.10 ppm when SCDHEC sampled on 4-5-12. **RAA calculated using results from April 2011 – March 2012. ***Range calculated using results from January – March 2012. ****Range calculated using results from April – Dec 2012.</p>					
Abbreviations: ppm: Parts per million (mg/L) ppb: Parts per billion (ug/L)		RAA: Running Annual Average NTU: Nephelometric Turbidity Units			



Established in 1903, the Hanahan Water Treatment Plant has undergone numerous expansions and upgrades, including a new filter building completed in 2011.

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 2012	Highest Level Recommended by USEPA
Chloride	21 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	18 ppm	No Standard
Alkalinity	28 ppm	
Conductivity	209 umhos/cm	
Hardness	54 ppm (3.16 gpg)	
Ortho-phosphate	1.2 ppm	
Silica	5.8 ppm	
Temperature	71.6°F (22°C)	
Abbreviations: ppm: Parts per million gpg: Grains per gallon PCU: Platinum Cobalt Units umhos/cm: Micromohs/cm		

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).

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, but even new plumbing materials may legally contain up to 8 percent lead.

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. 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.

Frequently Asked Questions

Is Charleston's water hard or soft?

Our water is moderately soft, with an average hardness level of 54 parts per million (ppm), or 3.16 grains per gallon (gpg). Some appliances specify the amount of detergent to use based on your water's hardness. Refer to an appliance's owner's manual for more information.

Why does the water sometimes taste earthy or musty?

Many things affect the taste and smell of water, including where it comes from, mineral content, temperature, weather changes, etc. Natural changes in our source water in spring and fall can sometimes impart a harmless earthy-musty taste to the water. We can adjust the treatment process to minimize this taste, but refrigerating your water or using ice will also help, as tastes and smells are less noticeable in cold water.

What causes that pink film around my bathroom drain and black growth on my faucet?

Both are caused by airborne microorganisms that thrive in warm, moist areas like bathrooms. The best way to combat these is to ensure proper ventilation and frequently clean problem areas with a bleach solution.

Do I need to boil my water after a service interruption?

Only if Charleston Water System issues a Boil Water Advisory or Notice, which is rare. Advisories are only issued after a major water main break, widespread loss of water pressure, or a problem at the treatment plant—problems that affect a large area. If this happens, we'll notify

the media and post information on our web site, www.charlestonwater.com, Twitter (@ChasWaterSystem) and phone system, 843-727-6800.

Advisories are not issued after most water main breaks because our crews can isolate the break by closing the nearest upstream and downstream valves. When the repair is complete, the affected pipe is cleaned and flushed, then put back into service by opening the valves.

Why does my water smell like rotten eggs?

A rotten egg odor is typically caused by one of three things in your home's plumbing system: Sulfur-producing bacteria in your water heater, a dried up S-trap in an unused sink, or decaying food in a kitchen sink disposal. If you only notice the odor when you use hot water, it's probably your water heater. Consult the owner's manual for instructions on how to flush it. If the problem is in an unused bathroom, turn on the tap to fill the S-trap. If the odor is in the kitchen, try cleaning the drain disposal.

Why does brown water come out of my tap after a service interruption?

A change in the pressure or direction of water flow can cause iron compounds that accumulate inside older water mains to break loose and become suspended in the water. Typically, our crews will open a nearby fire hydrant to flush out this discolored water before it reaches customers' taps. If you experience discolored water, flush your plumbing by turning on a faucet until the water runs clear. If it persists, call us at (843) 727-6800.

See the water treatment process in action

Check out the new videos on our web site.



Scan the QR code with your smart phone or visit www.charlestonwater.com/videos.htm.



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.

Charleston Water System
PO Box B
Charleston, SC 29402

Office Locations

Downtown	North Charleston
103 St. Philip Street	6296 Rivers Avenue

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

Contact Us

This report is produced annually and posted on our web site by May 1st. For more information, or to request hard copies, call our Customer Service Department at 843-727-6800 or send an email to customerservice@charlestoncpw.com.