Charleston Water System
PO Box B
Charleston, SC 29402

2013 Water Quality Report

May 2014

Charleston Water System

Photo by Charleston Water System associate Eric Griffin of his daughter enjoying tap water.

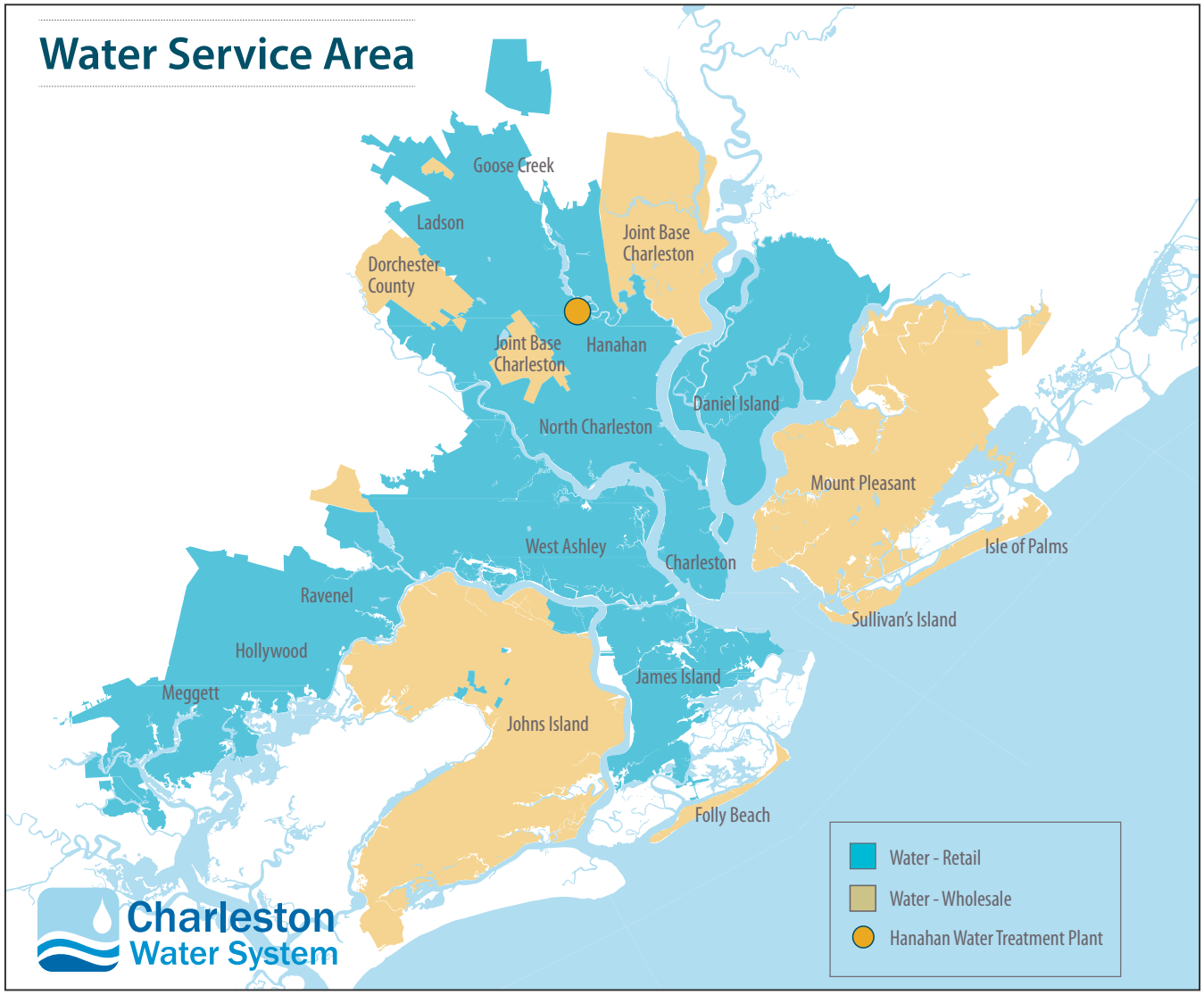
About Charleston Water System

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.

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.



About This Report

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

Downtown
103 St. Philip Street

North Charleston
6296 Rivers Avenue

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, visist www.charlestonwater.com.

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

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/HomeAndEnvironment/Water/SourceWaterProtection/.

How You Can Help

- Pick up the poop! Pet waste pollutes waterways with bacteria and excess nutrients.
- Don't over-fertilize your lawn. Excess fertilizers and pesticides wash into storm drains and pollute streams.
- Never pour anything into a storm drain. Storm drains collect rain water and empty directly into a waterway.

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.

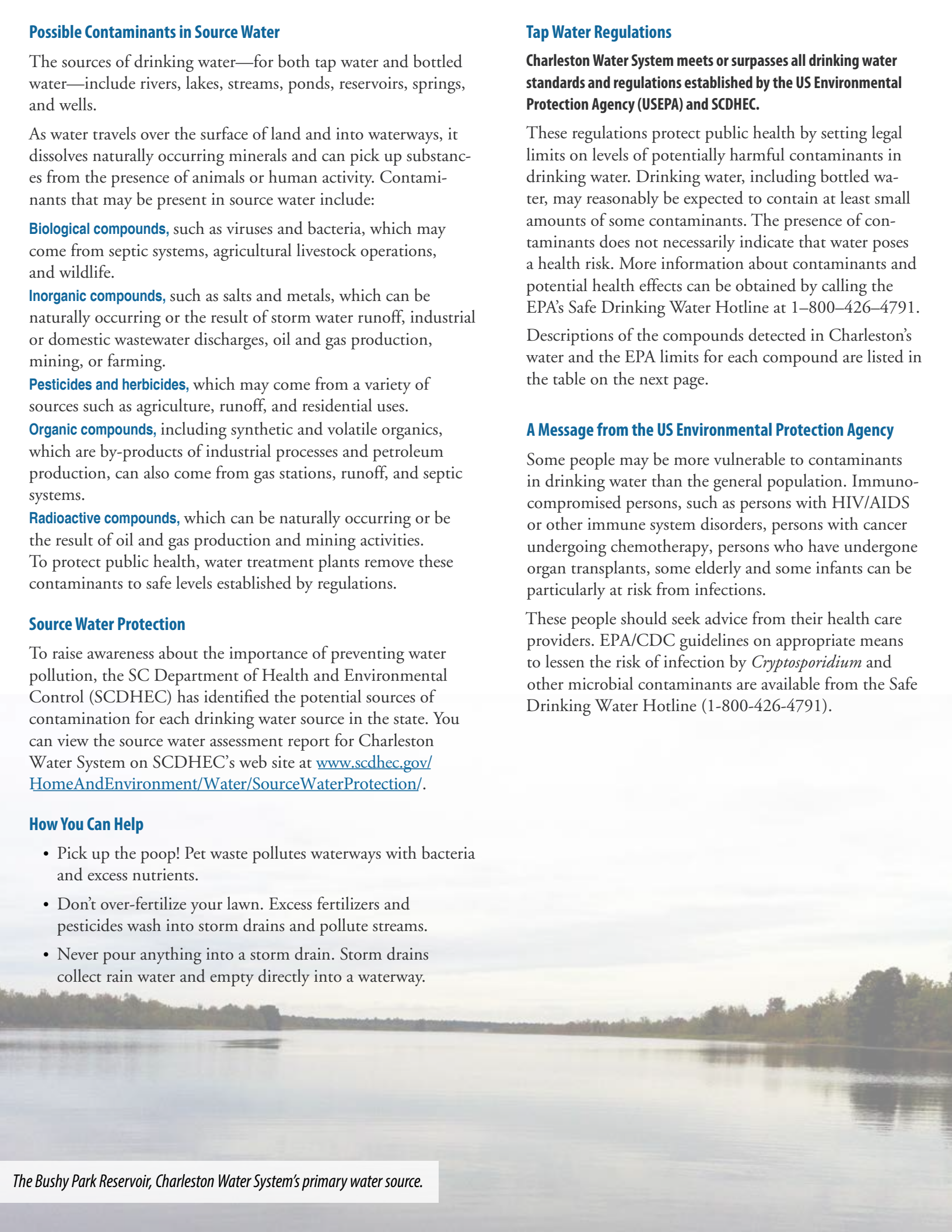
These regulations protect public health by setting legal limits on levels of potentially harmful contaminants in drinking water. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily 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.

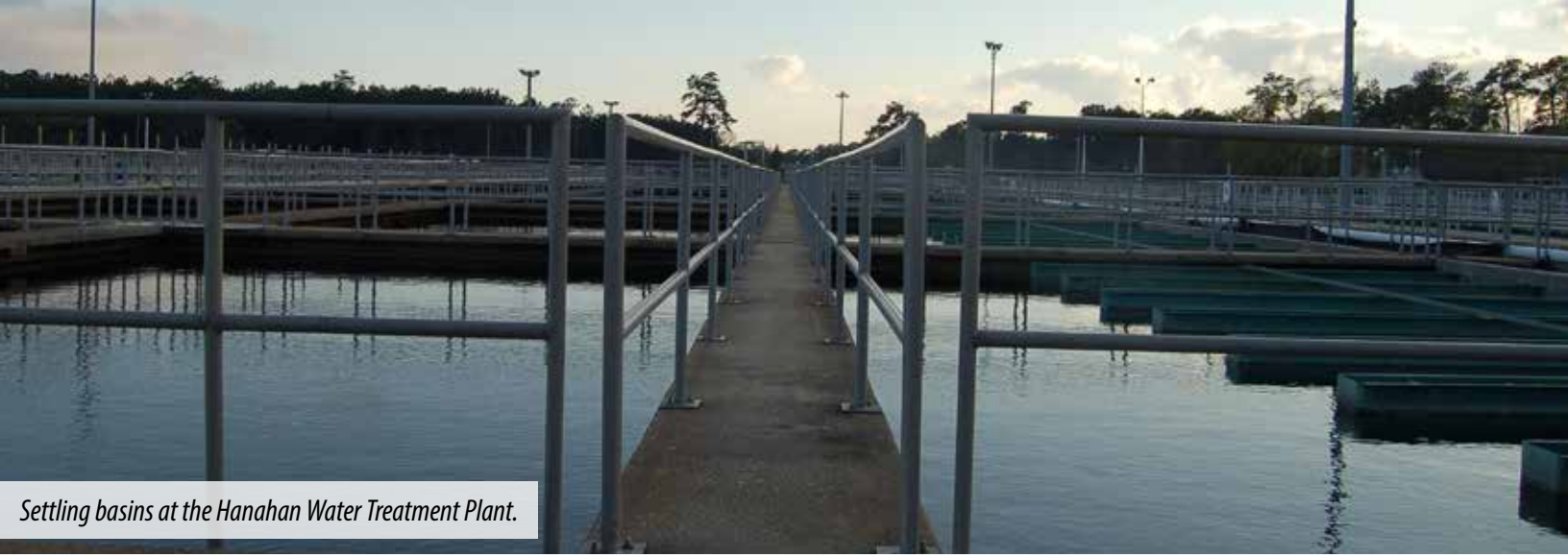
A Message from the US Environmental Protection Agency

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).



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



Settling basins at the Hanahan Water Treatment Plant.

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.

Installing a new water main in downtown Charleston.

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 microorganism.

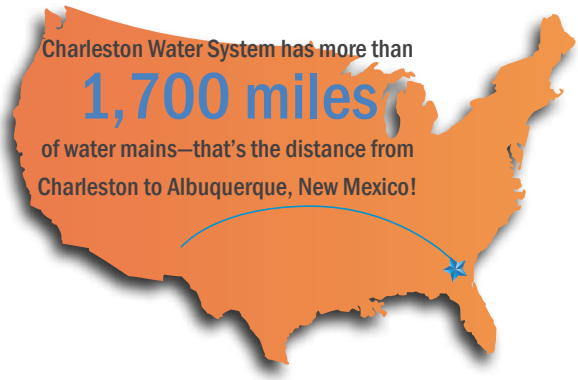
Finally, the water is disinfected to protect against disease-causing organisms, and the fluoride level is adjusted to protect dental health.

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

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 storages 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 the 110,000 homes and businesses served by Charleston Water System.



2013 Water Quality Results

Charleston Water System met or surpassed all water quality requirements in 2013

Charleston Water System's drinking water was tested more than 20,000 times for 150 substances and parameters in 2013. 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.

Our water was tested more
times and met or exceeded al
quality standards in 2013.
summary of lab test

	Constituent	Maximum Contaminant Level (MCL) set by EPA	Maximum Contaminant Level Goal (MCLG)	Actual Level in Charleston's Water for 2013
	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	N/A	0.15 NTU highest level detected 100% of monthly samples met the limit
	Cryptosporidium A parasite spread through human and animal waste that causes gastrointestinal illness.	No MCL; EPA requires specific treatment techniques (TT)	Zero *Cryptosporidium* oocysts per 1 liter of water	Zero *Cryptosporidium* oocysts per 1 liter of water
	Giardia A parasite spread through human and animal waste that causes gastrointestinal illness.	No MCL; EPA requires specific treatment techniques (TT)	Zero *Giardia* cysts per 1 liter of water	Zero *Giardia* cysts per 1 liter of water
	Detected in Our Water			
Inorganic Compounds	**Copper** 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	0.11 ppm* (no samples exceeded the action level) Range: 0 to 0.11 ppm
Inorganic Compounds	**Lead** 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 = 2.3 ppb* (one sample exceeded the action level) Range: 0 to 17 ppb
Inorganic Compounds	**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	0.14 ppm
Inorganic Compounds	**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	0.18 ppm in source water 0.64 ppm in finished water 0.50 ppm in finished water when SCDHEC sampled on 5-22-13.
Disinfectants	**Chlorine Dioxide** A disinfection agent added in small amounts to protect against microbes.	800 ppb	800 ppb	260 ppb Range: 0 to 260 ppb
Disinfectants	**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	3.14 ppm running annual average (RAA) Range: 2.8 – 3.5 ppm
Disinfection Byproducts	**Total Trihalomethanes (Stage 2)** 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.	80 ppb	N/A	Range: BDL – 26.55 ppb LRAA: 22 ppb
Disinfection Byproducts	**Total Haloacetic acids (Stage 2)** 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.	60 ppb	N/A	Range: 14.73 – 43.12 ppb LRAA: 35 ppb
Disinfection Byproducts	**Chlorite** A byproduct formed when chlorine dioxide is used to disinfect water.	1 ppm	0.8 ppm	0.87 ppm Range: 0.51 – 0.87 ppm
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: 55% to 84% removal Removal ratio RAA = 1.35 TOC values 2.0 – 3.7 ppm
Organic Compounds/Bacteria	**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%	0.6% highest % of positive monthly samples Range: 0 – 0.6% All repeat samples were satisfactory

*Results are from 2012. EPA requires testing for copper and lead once every three years.

Abbreviations:

ppm: Parts per million (mg/L)
ppb: Parts per billion (ug/L)
RAA: Running Annual Average
NTU: Nephelometric Turbidity Units
BDL: Below Detection Limit
LRAA: Locational Running Annual Average

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 Disinfecta
The highest level of disinfectant allowed i
that addition of a disinfectant is necessary

Maximum Residual Disinfecta
The level of a drinking water disinfectant
risk to health. MRDLGs do not reflect the b
microbial contamination.

than 22,600
ll regulations and
See below for a
results.

Possible Sources in Water
Soil runoff
Human and animal sources
Human and animal sources
Corrosion of household plumbing materials
Corrosion of household plumbing materials
Runoff from fertilizers
Naturally occurring in source water and adjusted during treatment to prevent tooth decay.
Added for disinfection
Added for disinfection
Byproduct of disinfection
Byproduct of disinfection
Byproduct of disinfection
Naturally present in the environment
Naturally present in the environment

nt Level (MRDL)
n drinking water. There is convincing evidence
for control of microbial contaminants.

nt Level Goal (MRDLG)
below which there is no known or expected
benefits of the use of disinfectants to control

Water Characteristics

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

For commercial customers with boilers or chillers, breweries, and other customers who need additional information, please contact Becky Thames, Laboratory Manager, at (843) 863-4038 or thamesrm@charlestoncpw.com.

Parameter	CWS Water Average 2013	Highest Level Recommended by USEPA
Chloride	17 ppm	250 ppm
Color	4 PCU	15 PCU
Iron	<0.10 ppm	0.3 ppm
Manganese	<0.05 ppm	0.05 ppm
Total Dissolved Solids (TDS)	71 ppm	500 ppm
Sodium	12 ppm	No Standard
Alkalinity	29 ppm	
Conductivity	192 umhos/cm	
Hardness	59 ppm (3.44 gpg)	
Ortho-phosphate	1.1 ppm	
Silica	7.4 ppm	
Temperature	69.8˚F (21˚C)	

Abbreviations: **ppm:** Parts per million **gpg:** Grains per gallon **PCU:** Platinum Cobalt Units **umhos/cm:** Micromohs/cm

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. 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.

Unregulated Contaminants

Unregulated contaminants are those that don't have a drinking water standard set by USEPA. The purpose of monitoring for these contaminants is to help EPA decide whether the contaminants should have a standard. Last year, as part of this effort, the EPA required water systems to test for 30 contaminants that are not currently regulated.

Below are the monitoring results for the six unregulated constituents that were detected in our water. For more information please contact Mary Ann Fuller, SCDHEC, at (803) 898-2382 or fullerma@dhec.sc.gov.

Name	Treated Water (Plant)		Distribution System	
	Average	Range	Average	Range
Total Chromium	0.26 ppb	BDL - 0.26 ppb	0.23 ppb	BDL - 0.23 ppb
Hexavalent Chromium (dissolved)	0.069 ppb	0.057 - 0.079 ppb	0.061 ppb	0.054 - 0.073 ppb
Strontium	53 ppb	45 - 59 ppb	53 ppb	46 - 61 ppb
Vanadium	1.0 ppb	0.5 - 1.4 ppb	0.94 ppb	0.53 - 1.2 ppb
Chlorate	187 ppb	150 - 240 ppb	210 ppb	190 - 230 ppb
1,4-Dioxane	0.228 ppb	0.211 - 0.244 ppb	BDL	BDL

ppb: parts per billion **BDL:** Below Dectection Limit