

CITY of CLEMSON, SC



Annual Water Quality Report

2019



2019 Annual Drinking Water Quality Report
City of Clemson, SC PWS ID # 3910004
Developed 2020

We're pleased to present to you this year's Annual Water Quality Report. This report is designed to inform you about the quality of your drinking water and services we deliver to you every day. Our constant goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts we make to continually improve the water treatment process and protect our water resources. The City of Clemson is committed to providing residents with a safe and reliable supply of high-quality drinking water. Your water is tested using sophisticated equipment and advanced procedures. Your water meets state and federal standards for both appearance and safety. The annual "Consumer Confidence Report," required by the Safe Drinking Water Act (SDWA), informs you where your water comes from, what our tests show about it, and other things you should know about your drinking water.

If you have any questions about this report or concerning your water utility, please contact Teddy Atkins or Benjie McGill at 864-653-2046. We want our valued customers to be informed about their water utility. If you want to learn more, please attend any of our regularly scheduled City Council meetings. They are held on the first and third Monday of each month at City Hall. The time of the meeting is posted at City Hall and on the City website at <http://www.cityofclemson.org>.

Water Source

Our water source is supplied by surface water from the U.S. Army Corps of Engineers Hartwell Lake Reservoir. The water from Lake Hartwell Reservoir is purchased from Anderson Regional Joint Water System (ARJWS). The plant operates 24 hours per day, every day of the year. During 2019, the plant treated 7.1 billion gallons of water. The plant is operated by highly trained state certified operators.

An Explanation of the Water-Quality Data Table:

The table shows the results of the water-quality analyses. This report is based upon tests conducted in the year 2019 by the City of Clemson and the Anderson Regional Joint Water System's Hartwell Lake Filter Plant (ARJWS). In addition to the continuous monitoring of water quality parameters, the ARJWS operators perform over 200 laboratory tests daily. The data presented in this report is from the most recent testing done in accordance with State and Federal regulations. Every regulated contaminant that was detected in the water, even in the minutest traces, is listed here. The table contains the name of each substance, the highest level allowed by regulation (MCL), the ideal goals for public health, the amount detected, the usual sources of such contaminants, footnotes explaining our findings, and a key to units of measurement. Definitions of MCL and MCLG are important.

In this table you will find many terms and abbreviations you might not be familiar with. To help you better understand these terms we've provided the following definitions:

Below Detectable Level (BDL): Laboratory analysis indicates that the contaminant is below the level of detection. This would indicate that the contaminant is either not present, or below the amount the analysis is able to detect.

NonDetects (ND): Laboratory analysis indicates that the constituent is not present.

Parts per million (ppm) or Milligrams per liter (mg/l): One part per million corresponds to one minute in two years or a single penny in \$10,000.

Parts per billion (ppb) or Micrograms per liter: One part per billion corresponds to one minute in 2,000 years, or a single penny in \$10,000,000.

Parts per trillion (ppt) or Nanograms per liter (nanograms/l): One part per trillion corresponds to one minute in 2,000,000 years, or a single penny in \$10,000,000,000.

Parts per quadrillion (ppq) or Picograms per liter (picograms/l): One part per quadrillion corresponds to one minute in 2,000,000,000 years or one penny in \$10,000,000,000,000.

Picocuries per liter (pCi/L): Picocuries per liter is a measure of the radioactivity in water.

Millirems per year (mrem/year): A measure of radiation absorbed by the body

Million Fibers per Liter (MFL): Million fibers per liter is a measure of the presence of asbestos fibers that are longer than 10 micrometers.

Nephelometric Turbidity Unit (NTU): Nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

Treatment Technique (TT): A treatment technique is a required process intended to reduce the level of a contaminant in drinking water.

Maximum Contaminant Level: The “Maximum Allowed” (MCL) is 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.

Maximum Contaminant Level Goal: The “Goal” (MCLG) is 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.

Running Annual Average: RAA

LRAA: Locational running annual average.

Operational Evaluation Level (OEL): It is determined at each monitoring location by calculating the sum of the two previous quarters’ results plus twice the current quarters’ results, then dividing by 4 to determine an average.

Maximum Residual Disinfectant Level or (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 or (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.

The data presented in this report is from the most recent testing done in accordance with regulations. The following is a partial list of a total of 76 contaminants that are monitored in your drinking water. This table shows only contaminants that were detected and what amount was detected. It also shows the maximum amount allowed by law (MCL) and a maximum goal amount (MCLG). The table also shows if a violation occurred.

SECONDARY STANDARDS: These tests indicate results that may affect the appearance, odors, and tastes in the drinking water.

Constituent	Annual Average	MCL
pH	7.12 ppm	6.5 - 8.5 ppm
Alkalinity	12.27 mg/L	N/A
Chlorine	1.60 mg/L	4.0 mg/L
Hardness	12.53 mg/L	N/A
Iron	BDL	0.30 mg/L
Manganese	BDL	0.005 mg/L
Sodium	5.1 mg/L	N/A
Sulfate	7.97 mg/L	250 mg/L

Contaminant	Date Tested	Level/Average Detected	Unit Measure	MCL	MCLG	Results	Range	Major Sources	Violation
<i>Microbiological Contaminants</i>									
<i>Total Coliform</i>	2019	0	0	0	0	0		Coliform are bacteria that are naturally present in the environment & are used as an indicator that other potentially harmful bacteria may be present. If Coliforms were found in more samples than allowed, this was a warning of potential problems.	NO
<i>E. Coli</i>	2019	0	0	0	0	0		Fecal coliforms & E. Coli are bacteria whose presence indicates that the water may be contaminated with human or animal waste. Microbes in these waste can cause short-term effects such as diarrhea, cramps, nausea, headaches, & other symptoms. They may pose a special health risk for infants, young children, & people with severely-compromised immune systems.	NO
<i>Inorganic Contaminants</i>									
<i>Lead **</i>	2019	90% percentile on CLEMSON for 30 sites sampled in 2019 was 0.007mg/L	mg/L	AL=15 0 sites over action level	0	90th % = 0.007	ND-0.013	Corrosion of household plumbing Erosion of natural deposits	NO
<i>Copper</i>	2019	90% percentile in CLEMSON for 30 sites	mg/L	AL=1.3 0 sites over	0	90th % = 0.27	0.012-0.14	Corrosion of household plumbing Erosion of natural deposits	NO

		sampled in 2016 was 0.231 mg/L		action level					
<i>Turbidity</i>	2019	0.05	NTU	0.5	<0.10	0.04	0.03-0.05	Soil runoff	NO
<i>Fluoride</i>	2019	0.43	mg/L	4	4	0.44	0.00-0.75	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories.	NO
<i>Nitrate</i>	2019	0.13	mg/L	10	10	0.25	0.25	Runoff from fertilizer use; leaching from septic tanks; sewage; erosion of natural deposits	NO
<i>Volatile Organic Contaminants</i>									
<i>TTHMs (Total Trihalomethanes)</i>	2019	DBP LRAA Site 20 = 0.0324 Site 21 = 0.0239 Site 22 = 0.0359 Site 23 = 0.0400	ppb	80	No goal for total	RAA = 11		By-product of drinking water chlorination	NO
<i>HAA (Haloacetic Acids)</i>	2019	DBP LRAA Site 20 = 0.0138 Site 21 = 0.0180 Site 22 = 0.0250 Site 23 = 0.0206	ppb	60	No goal for total	RAA = 7		By-product of drinking water chlorination	NO
<i>Chlorine</i>	2019	RAA = 1.60 ppm Range = 1.35-1.75 ppm ARJWS	ppm	4	MRDLG= 4	RAA = 1.60		Water additives used to control microbes	NO

Water Quality Table Footnotes

Contaminants that may be present in source water include:

- (A) Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- (B) Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban storm runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- (C) Pesticides and herbicides, which may come from a variety of sources such as agriculture, storm water runoff, and residential uses.
- (D) Organic chemical contaminants, including synthetic and volatile organics, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff and septic systems.
- (E) Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities. In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Microbiological Contaminants

Total Coliform: Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other potentially harmful bacteria may be present. No Coliform samples were found positive during the 2019 testing period.

Fecal Coliform and E. coli: Fecal Coliforms and E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal waste. Microbes in these wastes can cause short term effects such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems. No Fecal Coliform or E. coli was found in any samples during the 2019 testing period.

Copper: The data is from The City of Clemson's most recent test period, June 2019 –Sept 2019 and shows the 90th percentile results. No samples had a level greater than the action level of 1.3mg/l.

Lead: If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Clemson is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your drinking water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline 1-800-426-4791 or at <http://www.epa.gov/safewater/lead>.

Fluoride: Fluoride level is controlled at approximately 0.44 mg/l.

Turbidity: Turbidity is a measure of the clarity of the water. It is measured in Nephelometric Turbidity Units. We monitor Turbidity because it is a good indicator of the effectiveness of the filtration system. A turbidity of 5 NTU is just noticeable to the average person.

Trihalomethanes: Some people who drink water containing trihalomethanes in excess of the MCL over many years experience problems with their liver, kidneys, or central nervous systems, and may have increased risk of getting cancer.

Also during 2018, ARJWS was monitored for *PCBs/Toxaphene. No detections were noted.

Polychlorinated biphenyls (PCBs) are man-made chemicals that belong to a family of chemicals known as chlorinated hydrocarbons. PCBs were manufactured in the U.S. from 1929 until 1979, when their manufacture was banned due to concerns about their persistence, bioaccumulation, and potential for adverse effects on human health and the environment. Because PCBs are chemically stable with a high boiling point and non-flammable with excellent electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer and hydraulic equipment; as plasticizers in paints, plastics and rubber products (including caulk) and in many other industrial applications.

Toxaphene, a synthetic organic chemical, is an amber, waxy organic solid with a piney odor. It was used as an insecticide for cotton and vegetables, and on livestock and poultry. In 1982, most of its uses were banned and in 1990, all uses were banned in the United States. EPA regulates toxaphene in drinking water to protect public health. Toxaphene may cause health problems if present in public or private water supplies in amounts greater than the drinking water standard set by EPA.

Table of Total Organic Carbon (TOC) Removal

Analysis	Sample Frequency	Unit	MCL**	Results*	Average Source TOC	Source TOC Range	Major Sources	Violations
<i>Total Organic Carbon (TOC)</i>	<i>Monthly</i>	<i>mg/L</i>	<i>Treatment Technique (TT) required if target not met through step 1 criterion ARJWS</i>	<i>38% removal</i>	<i>1.81mg/L</i>	<i>1.61 - 2.32 mg/L</i>	<i>Naturally present in the environment</i>	<i>NO</i>

*For source water TOC level of >2.0 mg/L, 35% removal is required.

For source water TOC level of <2.0mg/L, an Alternate Criteria 1 is used.

Lake Hartwell meets this Alternate Criteria , as source water TOC is typically below 2.0 mg/L.

**If removal are under 35%, and source water TOC exceeds 2.0 mg/L, the TT criterion for TOC under Step 1 required.

The Step 1 criterion is defined by the EPA regulation R.61-58.13.F.

Source Water Assessment and Protection Plans

Source Water Assessment and Protection Plans (SWAP) were completed for all public water systems in South Carolina in May, 2003. SWAPs, among other things, identifies potential sources of contamination to drinking water supplies. The SC Department of Health and Environmental Control completed the plans for all SC public water systems. A copy of this assessment report can be obtained by contacting the Bureau of Water in Columbia, South Carolina at (803)898-4300 or on the web at <http://www.scdhec.gov/environment/water/srcewtr.htm>.

Water Quality Table Footnote

As you can see from the above table, our system had no violations. The above table shows the contaminants that had detections. There were many other regulated and unregulated contaminants which were tested. We are pleased to report that your drinking water meets or exceeds all Federal and State requirements.

Unregulated Contaminant Monitoring Regulation 3

The City of Clemson was monitored for Unregulated Contaminant Monitoring Regulation 3 (UCMR3) in 2013. Results for UCMR3 are kept on file at the City of Clemson Utilities Department. If you have any questions or would like to receive additional information concerning the UCMR3, please contact Teddy Atkins or Benjie McGill at (864) 653-2046.

The unregulated contaminants that were detected during the unregulated contaminant monitoring period are Hexavalent Chromium (Dissolved), Strontium, Chromium, and Chlorate. The unregulated contaminants which were tested for but were not detected are 1,1-Dichloroethane, 1,2,3-Trichloropropane, 1,3-butadiene, 1,4-Dioxane, Bromochloromethane, Bromomethane (Methyl Bromide), Chlorodifluoromethane, Chloromethane (Methyl Chloride), Cobalt, Molybdenum, Perfluorooctanesulfonic acid – PFOS, Perfluoro-1-butanesulfonic acid – PFBS, Perfluoro-1-hexanesulfonic acid – PFHxS, Perfluoroheptanoic acid – PFHpA, Perfluoro-n-nonanoic acid – PFNA, Perfluorooctanoic acid – PFOA, and Vanadium.

Additional Contaminant Testing

Additional contaminants that were tested for by Anderson Regional Joint Water System (ARJWS), but were not detected are Arsenic, Cadmium, Cyanide(total), Mercury, Nickel, Nitrate, Nitrite, Selenium, Gross Alpha(Radioactive), Hexachlorocyclopentadiene, Propachlor, Hexachlorobenzene, Lindane, Heptachlor, Aldrin, Alachlor, Heptachlor Epoxide, Chlordane, Metolachlor, Butachlor, Dieldrin, Endrin, Methoxychlor, Toxaphene, Simazine, Atrazine, Metribuzin, Di2(Ethylhexyl) Adipate, Di2(Ethylhexyl) Phthalate, Aldicarb Sulfoxide, Aldicarb Sulfone, Oxamyl (Vydate), Methomyl, 3Hydroxycarbofuran, Aldicarb, Carbofuran, Carbaryl(Sevin), Dalapon, Dicamba, 2,4D, Pentachlorophenol, Silvex, Dinoseb, Picloram, PCB as Decachlorobiphenyl, Benzo(a)Pyrene, pIsopropyltoluene, Chloromethane, Dichlorodifluoromethane, Bromomethane, Chloroethane, Fluorotrichloromethane, Hexachlorobutadiene, Naphthalene, 1,2,4Trichlorobenzene, Cis1,2Dichloroethylene, Dibromomethane, 1,1Dichloropropene, 1,3Dichloropropane, 1,3Dichloropropene, 1,2,3Trichloropropane, 2,2Dichloropropane, 1,2,4Trimethylbenzene, 1,2,3Trichlorobenzene, nButylbenzene, 1,3,5Trimethylbenzene, TertButylbenzene, SecButylbenzene, Bromochloromethane, Bromoform, Chlorodibromomethane, Xylenes(total), Dichloromethane, oChlorotoluene, pChlorotoluene, mDichlorobenzene, oDichlorobenzene, pDichlorobenzene, Vinyl Chloride, 1,1Dichloroethylene, 1,1Dichloroethane, Trans1,2Dichloroethylene, 1,2Dichloroethane, 1,1,1Trichloroethane, Carbon Tetrachloride, 1,2Dichloropropane, Trichloroethylene, 1,1,2Trichloroethane, 1,1,1,2Tetrachloroethane, Tetrachloroethylene, 1,1,2,2Tetrachloroethane, Chlorobenzene, Benzene, Toluene, Ethylbenzene, Bromobenzene, Isopropylbenzene, Styrene, nPropylbenzene, Barium, 2,4dinitrotoluene, 2,6dinitrotoluene, Acetochlor, DCPA monoacid degradate*/DCPA diacid degradate*; 4,4'DDE, EPTC, Molinate, MTBE, Nitrobenzene, Perchlorate, Terbacil.

*DCPA degradates are not separately determined by these methods; therefore, they will be reported as the sum of both degradates.

Required Additional Health Information

In order to ensure that tap water is safe to drink, the Environmental Protection Agency (EPA) prescribes limits on the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water which must provide the same protection for public health. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and radioactive material, and can pick up substances resulting from the presence of animals or from human activity. All drinking water, including bottled drinking water, may be reasonably expected to contain at least small amounts of some contaminants. It's important to remember that the presence of these contaminants does not necessarily pose a health risk. The sources of drinking water (both tap water and bottled water) included rivers, lakes, streams, ponds, reservoirs, springs, and wells. MCL's are set at very stringent levels. To understand the possible health effects described for many regulated constituents, a person would have to drink 2 liters of water every day at the MCL level for a lifetime to have a one-in-a-million chance of having the described health effect. As you can see by the table, our system had no violations. We are proud that your drinking water meets or exceeds all Federal and State requirements. We have learned through our monitoring and testing that some constituents have been detected. The EPA has determined that your water IS SAFE at these levels. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791.

Nitrates: As a precaution we always notify physicians and health care providers in this area if there is ever a higher than normal level of nitrates in the water supply.

Lead: Lead in drinking water is rarely the sole cause of lead poisoning, but it can add to a person's total lead exposure. All potential sources of lead in the household should be identified and removed, replaced or reduced.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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. EPA/CDC guidelines on appropriate means to lessen the risk of infection by cryptosporidium and other microbiological contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Water quality is an important concern for water utility customers everywhere. Very few countries provide the quality of tap water found in the United States. EPA establishes guidelines to help insure that the water provided to you by the water purveyor is safe and desirable. However, water purveyors cannot control the various conditions of plumbing in households and businesses. When you have a high number of customers drawing water from main lines, water is used at a higher rate creating turnover of older water and allowing for fresher water to enter in its place. The water between the main line and your water faucet has fewer sources drawing water from it; those sources are limited to the occupants of the household or business. With fewer sources drawing water from the customer's service line, the turnover of water in that line is greatly reduced. To illustrate this point, think of the difference between a river and a pond, a river is flowing allowing fresher water to move into the place of older water, a pond stagnates reducing the turnover of older water making it generally less safe. The City of Clemson recommends that you run water from the faucet for at least thirty seconds prior to drinking or cooking to ensure that any residual sediment in plumbing is flushed out and fresher

water from the water main has entered through the faucet. Customers should not drink or cook with water from the hot water side of their water faucet. Water drawn from the hot side of their water faucet comes from the hot water heater which stores water for an unspecified amount of time. This increases the age of the water in the tank and decreases the turnover time for fresher water to take its place. Water heaters act as sumps since water enters and leaves from the top of the water heater causing sediment and rust to accumulate leading to possible discolored water

In our continuing efforts to maintain a safe and dependable water supply it may be necessary to make improvements to the water system. The costs of these improvements may be reflected in the rate structure. Rate adjustments may be necessary in order to address these improvements.

The City of Clemson Utilities Department works around the clock to provide top quality water to every tap. We ask that all our customers help us protect our water sources, which are the heart of our community, our way of life, and our children's future.

We are members of the American Water Works Association (AWWA), the Water Environment Federation, (WEF), the Water Environmental Association of South Carolina (WEASC), and the South Carolina Rural Water Association (SCRWA).

Water Quality Data for community water systems throughout the United States is available at www.waterdata.com.