Greenville Water System

Greenville, South Carolina

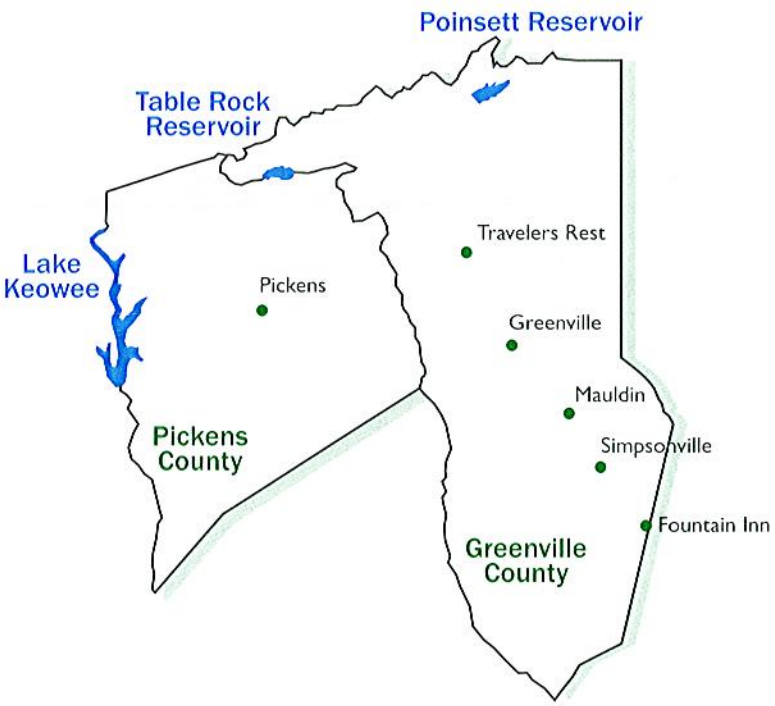
Water Quality Report for 2006

Greenville's Water Meets All Standards

The Environmental Protection Agency (EPA) and the State Department of Health and Environmental Control (DHEC) have established strict standards for drinking water. These criteria are designed to protect consumers from water-borne illnesses. In order to protect its customers, the Greenville Water System and DHEC collected over 41,000 samples and performed more than 131,000 tests for the parameters during 2006. The results of detected regulated compounds are detailed in the following pages. Also listed are regulated and unregulated compounds that were not detected.

Tests listed in this report were conducted by SCDHEC, by the Greenville Water System in its SCDHEC certified laboratories or by other certified laboratories. The System ensures your water quality by testing water samples collected during the treatment process and as the water is delivered to customers through approximately 2,450 miles of pipeline.

The Water Quality Report indicates that the Greenville Water System's watershed protection practices and treatment procedures are highly effective. But more importantly, **our water is pure and safe to drink.**



Where does my water come from?

The Greenville Water System draws water from three sources: **Table Rock Reservoir** on the South Saluda River; **Poinsett Reservoir** on the North Saluda River and **Lake Keowee.**

Table Rock and Poinsett Reservoirs are both located in the foothills of the Blue Ridge Mountains in northern Greenville County. The Greenville Water System owns 100 percent of both watersheds. Additionally, the Water System regularly patrols and carefully maintains these uninhabited, pristine lands. The properties are further protected by a Conservation Easement with The Nature Conservancy.

Lake Keowee is owned by Duke Energy. The Water System has an agreement with Duke to ultimately withdraw up to 150 million gallons per day (MGD) for our customers' water needs. Table Rock and North Saluda have the capacity to deliver up to 30 and 63 MGD, respectively.

SC DHEC conducted a Source Water Assessment on Greenville's three water sources. The document is available at www.scdhec.net/water or by calling (803) 898-4300. No sources of contamination were found in either the North Saluda or Table Rock watersheds. One hundred forty five potential contaminant sources were found in the 377 square mile watershed of Lake Keowee. The Greenville Water System has not detected any contaminants in the finished drinking water from the Lake Keowee source.

How is my water treated?

All water supplied by the Greenville Water System is filtered. The Adkins Filter Plant, a modern conventional filtration plant with a current capacity of 60 MGD, draws water from Lake Keowee. This plant uses coagulation, sedimentation, filtration and disinfection to treat the source water. Alum is used in the coagulation step along with small amounts of sodium hydroxide for pH adjustment. Chlorine, combined with ammonia, is used for disinfection to protect against water-borne diseases and a polyphosphate is added for corrosion control. Fluoridation is provided to prevent tooth decay.

A new state-of-the-art filter plant was placed in service in July 2000, to provide filtration for all water drawn from the Table Rock and Poinsett reservoirs. This new plant, with a capacity of 75 MGD, is the largest in the United States to use Dissolved Air Flotation (DAF) in the treatment process. The DAF Plant uses an innovative flotation process for particle removal rather than sedimentation. Remaining processes and chemicals used are similar to those at the Adkins Plant.

All treatment plants are rigidly maintained and monitored by State Certified Environmental Systems Operators who are thoroughly trained to make routine chemical and physical tests for treatment control.

What if I have questions?

If you would like more information about water treatment techniques or about our water quality, contact the Greenville Water System's Laboratory at **864.241.7838**. You can visit our web page at **greenvillewater.com**, or contact us by e-mail at **laboratory@greenvillewater.com**.

Este informe contiene la informacion importante sobre la clidad del agua in su comunidad. Hable por favor con algjien que puede traducirlo para usted.

General Interest Water Quality

Parameters of General Interest		Data is from 2006		
Parameter		Avg.	Low	High
Alkalinity	mg/L	7.9	5.2	30
Calcium	mg/L	1.5	ND	8.5
Conductivity	uS/cm	53	45	94
Hardness	mg/L	5.5	ND	22
Magnesium	mg/L	0.44	0.1	1
Potassium	mg/L	0.72	ND	1.2
Phosphate (total)	mg/L	0.94	0.72	1.3
Ammonia (total)	mg/L	0.48	ND	1.3
Sodium	mg/L	7.7	5.7	11

mg/L = milligrams per liter (parts per million-ppm)
uS/cm = miroseimens per centimeter

AWOP Achievement Award

The Area Wide Optimization Program (AWOP) was established by SC DHEC in order to encourage water treatment facilities to strive toward excellence in water treatment. We are proud to announce that both the Table Rock and North Saluda Water Treatment Plant and the Adkins Water Treatment Plant were honored with this prestigious award in 2001, 2002, 2003, 2004, and 2005.

The tables in this report list all the regulated drinking water contaminants that were detected during the **2006** calendar year, except where noted. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the tables contain data from testing done **January 1-December 31, 2006**. SC DHEC requires us to monitor for certain contaminants that are not expected to vary significantly from year to year. Some of the data, though representative of the water quality, maybe more than one year old.

Terms and Abbreviations:

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.

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

SU (Standard Units):
Unit of measure to indicate water acid/base scale (pH).

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

ppm (Parts per Million):
This is the same as Milligrams per Liter, or one penny out of $10,000.

ppb (Parts per Billion):
This is the same as Micrograms per Liter, or one penny out of $10,000,000.

NA (Not Applicable):
Does Not Apply.

ND (Not Detected):
Not detected or below detection limits.

NTU (Nephelometric Turbidity Units):
Units of measure to indicate water clarity.

MRDL (Maximum Residual Disinfectant Level):
The maximum permissible level of a disinfectant added for water treatment that may not be exceeded at the consumer's tap without an unacceptable possibility of adverse health effects. MRDLs are enforceable standards.

MRDLG (Maximum Residual Disinfectant Level Goal):
The maximum level of a disinfectant in drinking water at which no know or anticipated adverse effect on the health of persons would occur and that allows for an adequate margin of safety. MRDLG's are nonenforceable public health goals.

Secondary Standards:
Non-enforceable guidelines regulating contaminants that may cause cosmetic effects or aesthetic effects.

Primary Drinking Water Standards—All data from 2006

Parameter	Unit	MCL	MCLG	Range	Highest Level Detected	Possible Sources	Violation
Inorganic Compounds							
Fluoride	ppm	4	4			Drinking water additive	
DAF Plant				NA	0.70	*Fluoride added during treatment to prevent tooth decay*	NO
Adkins Plant				NA	0.78		NO
General Distribution				0.65 - 0.95	Avg = 0.80		NO
Nitrate/Nitrite (as nitrogen)	ppm	10	10				
DAF Plant				NA	0.0	Erosion of natural deposits; fertilizer runoff	NO
Adkins Plant				NA	0.08		NO
General Distribution				ND - 0.17	Avg = 0.04		
Organic Compounds							
Total Trihalomethanes							
General Distribution	ppb	80	0	1.8 - 15.8	Avg = 8.4	By-products of disinfection	NO
Total Haloacetic Acids							
General Distribution	ppb	60	0	5.6 - 22.6	Avg = 11.4	By-products of disinfection	NO
Total Organic Carbon(TOC)				Percent Removal	Range	Occurs naturally in the environment	
DAF Plant (samples collected monthly)		TT	N/A	34% (35% required)	18-56%		NO
Adkins Plant (samples collected monthly)		TT	N/A	20% (35% required)	0-40%		NO
							Due to low raw water TOC levels, Adkins and DAF plants are in compliance
		MRDL	MRDLG				
Disinfectants							
Chloramine	ppm	4	4	0.09 - 3.3	Avg. = 1.9	Water additive to control microbes	NO
Free Chlorine (March only)	ppm	4	4	0.11 - 2.5	Avg. = 1.6		

Microbial & Physical Characteristics

Parameter	Units	MCL	Results	Possible Sources	Violation
Total Coliform	% positive per month	Less than 5%	1.2% Maximum	Common in the environment; human and animal waste	NO
Turbidity		95% of samples			
DAF Plant	NTU	<0.3	Maximum = 0.05; Average = 0.03	Soil runoff	NO
Adkins Plant	NTU	<0.3	Maximum = 0.10; Average = 0.04	Soil runoff	NO
Distribution System	NTU	NA	Average=0.11 100% of plant samples are below MCL	Soil runoff	NO

Lead & Copper Rule

Parameter	Units	Action Level (AL)	90th Percentile Value		Possible Sources	Violation
Data is from 2006			Spring 2006	Fall 2006		
Lead- Customer's plumbing	ppb	15	2.3	2.0	Corrosion of household plumbing	NO
Copper - Customer's plumbing	ppm	1.3	0.10	0.07	Corrosion of household plumbing	NO
Sample Sites Exceeding Action Level			1 out of 101	3 out of 102		

Secondary Standards

Parameter	Units	MCL	Range	Average	Possible Sources	Violation
Chloride	ppm	250	2.5 - 10.2	3.9	Soil runoff	NO
Color	color	15	ND - 26	ND	Naturally occurring	NO
Iron	ppb	300	ND - 1300	25	Soil runoff, pipe material	NO
Manganese	ppb	50	ND	ND	Soil runoff	NO
pH	SU	6.5 - 8.5	6.5 - 9.4	7.7	Controlled at treatment plant	NO
Solids (Total Dissolved)	ppm	500	22 - 52	37	Soil runoff	NO
Zinc	ppm	5	ND - 0.65	0.07	Drinking water additive	NO
Sulfate	ppm	250	5.1 - 8..4	6.6	Drinking water additive	NO
Aluminum	ppm	0.05 - 0.20	N/A	ND	Drinking water additive	NO
Silver (2003)	ppm	0.10	N/A	ND	Some home water treatment filters, mining operations	NO

Tests were performed during 2006 (unless noted) for the following contaminants. NONE WERE DETECTED.

- **Primary Inorganic Elements:** Antimony; Arsenic; Barium; Beryllium; Cadmium; Chromium; Mercury; Nickel; Selenium; Thallium.
- **Synthetic Organic Compounds (SOCs)*:** 1,2-Dibromo-3- Chloropropane (DBCP); 1,2-Dibromoethane (EDB); 2,4,5- TP (Silvex); 2,4-D; Alachlor (Lasso); Aldicarb (Temik); Aldicarb sulfone; Aldicarb sulfoxide; Atrazine; Benzo(a)pyrene; Carbofuran; Chlordane (Technical Chlordane); Dalapon; Di(2-ethylhexyl)adipate; Di(2-ethylhexyl)phthalate; Dinoseb; Diquat; Endothall; Endrin; Glyphosate (Round-up); Heptachlor; Heptachlor epoxide; Hexachlorobenzene; Hexachlorocyclopentadiene; Lindane (gamma-BHC); Methoxychlor; Oxamyl (Vydate); Pentachlorophenol (PCP). Picloram; Polychlorinated biphenyls (PCBs); Simazine; Toxaphene.
- **Volatile Organic Compounds (VOCs):** 1, 1, 1-Trichloroethane; 1, 1, 2- Trichloroethane; 1, 1-Dichloroethylene; 1, 2-Dichloroethane; 1, 2- Dichloropropane; 1, 3- Dichlorobenzene; 1, 4-Dichlorobenzene; Benzene; Carbon Tetrachloride; Chlorobenzene; cis-1, 2-Dichloroethylene; Ethylbenzene; M, P-Xylenes; Methylene Chloride; o-Xylene; Styrene; Tetrachloroethylene; Toluene; trans 1,2-Dichloroethyiene; 1, 2, 4- Trichlorobenzene; Trichloroethylene; Vinyl Chloride.
- **Other Organic Compounds:** 1, 1, 1, 2- Tetrachloroethane; 1, 1, 2, 2-Tetrachloroethane; 1, 1-Dichloroethane; 1, 1-Dichloropropene; cis-1,3-Dichloropropene; 1, 2, 3-Trichlorobenzene; 1, 2, 3-Trichloropropane (TCP); 1, 2, 4-Trimethylbenzene; 1, 2-Dichlorobenzene; 1, 3, 5-Trimethylbenzene; 1, 3-Dichloropropane; 2, 2-Dichloropropane; 2-Chlorotoluene; 4-Chlorotoluene; Bromobenzene; Bromochloromethane; Bromomethane; Chloroethane; Chloromethane; Dibromomethane; Dichlorodifluoromethane; Hexachlorobutadiene (HCBD); Isopropylbenzene; Naphthalene; N-Butylbenzene; N-Propylbenzene; P-Isopropyltoluene; Sec-Butylbenzene; Tert-Butylbenzene; trans-1, 3-Dichloropropene; Trichlorofluoromethane.
- **Unregulated Compounds:** 3-Hydroxycarbofuran; Aldrin; Butachlor; Carbaryl; Dicamba; Dieldrin; Methomyl; Metolachlor (Dual); Metribuzin (Sencor); Propachlor.
- **In Compliance with Treatment Techniques for:** Giardia; Legionella; Viruses.
- **Radiological:** Gross alpha; Gross beta (done in 2001).

The Greenville Water System was monitored for four consecutive quarters during 2001 for 12 parameters (listed below) required under **NONE WERE DETECTED**: 2,4-Dinitrotoluene; 2,6-Dinitrotoluene; Acetochlor; DCPA mon-acid; DCPA di-acid; 4,4'-DDE; EPTC; Molinate; Methyl Tert-Butyl Ether (MTBE); Nitrobenzene.

Giardia and *Cryptosporidium*

The Greenville Water System has conducted monthly testing of raw and finished water for these single celled organisms since 1994. Only a few of these organisms have ever been detected. During 2006, no *Giardia* cysts and no *Cyrptosporidium* oocysts were detected from Lake Keowee raw water. No organisms were detected from Table Rock and North Saluda reservoirs and none from either treatment plant finished water. *Cryptosporidium* is a one celled protozoan, too small to be seen without a microscope. It can be found in the feces of infected animals or humans. When present in sufficient numbers, it can cause symptoms that can include diarrhea, nausea and stomach cramps. Other sources of *Cryptosporidium* include unwashed hands, contaminated surfaces inside and outside the home, contaminated food and recreational waters. No precaution about our drinking water is currently needed for the general public. People with weakened immune systems should speak with their health care providers about how to protect themselves against *Cryptosporidium* from all sources.

The Environmental Protection Agency requires that annual water quality reports contain the following statements:

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 Environmental Protection Agency's Safe Drinking Water Hotline (800.426.4791).

The 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 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 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, storm water runoff, and residential uses.
- 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 run off and septic systems.
- 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 contaminates in bottled water which must provide the same protection for public health.

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 are available from the Safe Drinking Water Hotline (800.426.4791).

Inadequately treated water may contain disease-causing organisms. These organisms include bacteria, viruses, and parasites which can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

Conserve Water and Save Money. Here's How . . .

Take a quick shower rather than a bath and save an average of 20 gallons of water.

When brushing teeth or shaving, turn the water off and save more than 5 gallons per day.

Keep your tap water cold in the refrigerator rather than running water until it is cold enough for drinking.

Water your lawn before 8 a.m., otherwise you can lose up to 30% of your water due to evaporation during midday hours.

Avoid watering your lawn on windy days.

Use a broom to clean your driveway and sidewalks instead of water.

When washing your car, use a bucket with soapy water. Use a nozzle on your hose for rinsing. This will control the flow of water.

Place a cover on your pool or spa. Left uncovered, you can lose up to 1,000 gallons of water per month.

water

Conserve More to Have More.

To find out more on water conservation, go to www.waterwiser.org

How can I get involved?

The Commissioners of Public Works, the elected officials who control the Water System, hold regular meetings on the second Monday of each month. These meetings are held at Greenville Water System, 407 West Broad Street, and begin at 8:30 a.m.

The public is welcome to attend.