Greenville Water System

Greenville, South Carolina

Water Quality Report for 2002

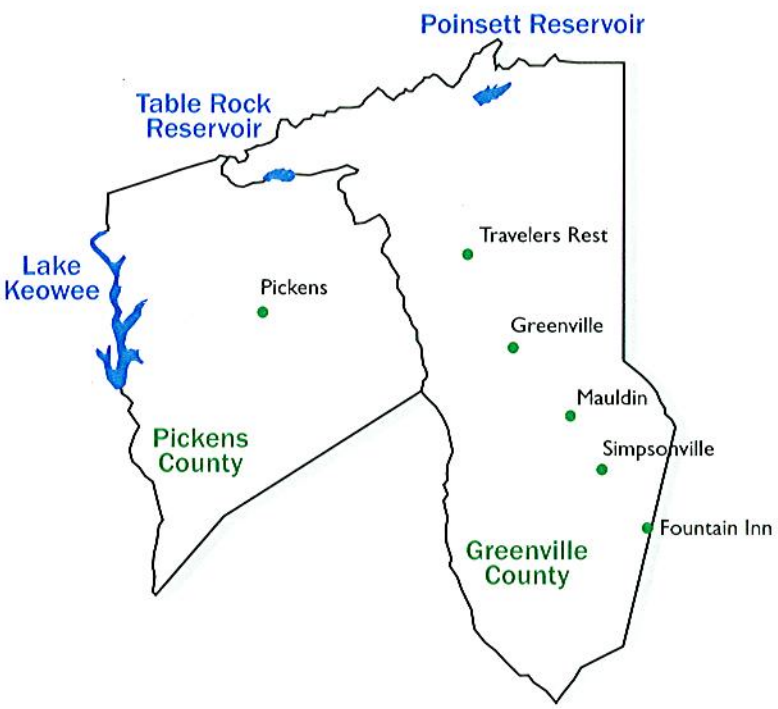
Greenville's Water Meets All Standards

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 bacteria and water-borne illnesses. In order to protect its customers, the Greenville Water System and DHEC collected over 30,000 samples and performed more than 87,000 meticulous tests for the parameters during 2002. The results of detected regulated compounds are detailed in the following pages. Also listed are regulated and unregulated compounds that were not detected.

Most of the tests are conducted by DHEC. The remaining analyses are performed by Greenville Water System in our DHEC certified laboratories or another private laboratory. The System ensures your water quality by testing water samples collected during the treatment process and as the water is delivered to customers en route through the 2,250 miles of local pipeline.

The Water Quality Reports indicate 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 is conducting Watershed Assessments on all three sources. Results should be available from SC DHEC in 2003.

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 45 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.

We are happy to report that the Water System received the highest of three possible ratings from SC DHEC during its most recent annual inspection.

A new state-of-the-art filter plant was placed in service on July 8, 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 site at ***greenvillewater.com***, or contact us by e-mail at ***laboratory@greenvillewater.com***.

The tables in this report list all the drinking water contaminants that were detected during the **2002** calendar year. 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, 2002**. 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 Contminant 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(Treament 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 known 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.

Primary Drinking Water Standards—All data from 2002

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*	NO
Adkins Plant				NA	0.57	*treatment to prevent*	NO
General Distribution				0.25 - 1.3	Avg = 0.85	*tooth decay*	NO
Nitrate/Nitrite (as nitrogen)	ppm	10	10				
DAF Plant				NA	0.03	Erosion of natural deposits;	NO
Adkins Plant				NA	0.06	fertilizer runoff	NO
General Distribution				ND - .37	Avg = ND		NO
Organic Compounds							
Total Trihalomethanes	ppb	80	0				
General Distribution				10.3 - 35.6	Avg = 19.4	By-products of disinfection	NO
Total Haloacetic Acids	ppb	60	0				
General Distribution				5.7 - 19.8	Avg = 12.7	By-products of disinfection	NO
TOC (Total Organic Carbon)							
Adkins Plant	ppm	*TOC is not regulated and therefore has no MCL or MCLG.*		0.60 - 0.90	Avg. = 0.80	Naturally occurring	NA
DAF	ppm			0.60 - 1.0	Avg. = 0.90		
		MRDL	MRDLG				
Disinfectants							
Chloramine	ppm	4	4	1.6 - 2.6	Avg. = 2.4	Water additive to control	NO
Free Chlorine (March only)	ppm	4	4	0.10 - 3.2	Avg. = 1.4	microbes	NO

Information Collection Rule

Parameter	Unit	MCL	MCLG	Range N Saluda	Range T Rock	Range Adkins	Possible Sources	Violation
Total Organic Carbon	ppm	*These parameters are not regulated and therefore have no MCL or MCLG.*		0.86 - 1.61	0.83 - 1.24	0.71 - 2.78	Decay of natural deposits	NO
Total Organic Halide	ppb			71 - 100	99 - 140	ND - 110	By-products of disinfection	NO
Chloral Hydrate	ppb			0.99 - 3.21	1.75 - 4.08	ND - 5.28	By-products of disinfection	NO
Cyanogen Chloride	ppb			--------	---------	2.5 - 4.6	By-products of disinfection	NO
Haloacetic Acids (HAAS)	ppb			16.8 - 34.1	20.6 - 42.4	2.7 - 29.4	By-products of disinfection	NO
Total Trihalomethanes	ppb	100	0	9.3 - 26.2	13.7 - 29.8	5.2 - 20.4	By-products of disinfection	NO

**All ICR data was collected from July, 1997 to December, 1998*

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					
DAF Filter Plant	NTU	NA	Maximum = 0.17; Average = 0.05	Soil runoff	NO
Adkins Filter Plant	NTU	0.5	Maximum = 0.19; Average = 0.04	Soil runoff	NO
General Distribution	NTU	0.5	0.13 highest average monthly value	Soil runoff	NO

Lead & Copper Rule

Parameter	Units	Action Level (AL)	90th Percentile Value	Sample Sites Exceeding Action Level	Possible Sources	Violation
Lead	ppb	15	2.2	0 out of 50	Corrosion of household plumbing	NO
Copper	ppb	1300	80	0	Corrosion of household plumbing	NO

Secondary Standards

Parameter	Units	MCL	Range	Average	Possible Sources	Violation
Chloride	ppm	250	3.1 - 44	18	Soil runoff	NO
Color	color	15	ND - 12	ND	Naturally occurring	NO
Iron	ppb	300	ND - 670	28	Soil runoff	NO
Manganese	ppb	50	ND - 20	15	Soil runoff	NO
pH	SU	6.5 - 8.5	6.4 - 10.4	7.6	Controlled at treatment plant	NO
Solids (Total Dissolved)	ppm	500	28 - 54	38	Soil runoff	NO
Zinc	ppm	5	ND - 0.46	0.05	Drinking water additive	NO
Sulfate	ppm	250	7.8 - 16	11.9	Drinking water additive	NO
Aluminum	ppm	0.05 - 0.20	N/A	0.04	Drinking water additive	NO
Surfactants	ppm	0.50	N/A	0.30	Naturally occurring	NO

Tests were performed during 2002 (unless noted) for the following contaminants, but 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.
- **Secondary Elements:** Silver
- **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.

Most recent testing conducted in 2002 for DAF and Adkins Plant.

***Most recent testing conducted in 2001 for DAF Plant and 2002 for Adkins Plant.*

The Greenville Water System was monitored for four consecutive quarters during 2001 for 12 parameters (listed below) required under the Unregulated Contaminant Monitoring Rule. **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.

The Information Collection Rule and *Cryptosporidium*

The Greenville Water System, along with all other large water systems throughout the United States, participated in a major testing program known as the Information Collection Rule (ICR). The ICR testing program covered a period of 18 months and began in July, 1997. It was intended to provide EPA with information about the occurrence of chemical by-products due to disinfection, plus information about disease-causing pathogens (microorganisms). The EPA will use the data gathered through the ICR to develop or revise drinking water standards. *Cryptosporidium* is one of the microorganisms analyzed under the ICR. No viable (living) oocysts were detected in Greenville's source water under the ICR program. Even before the ICR, the Greenville Water System began monthly testing at all three water sources for *Cryptosporidium*. Since 1994 when *Cryptosporidium* testing began, few oocysts have been detected. During 2002, no organisms were detected in raw water and none in finished drinking water from the Adkins filter plant or the DAF filter plant. *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 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 the 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, stormwater runnoff, 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 stormwater 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 . . .

water
Conserve More to Have More.

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.

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

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.

How can I get involved?

The Commissioners of Public Works, the elected officials who control the Water System, hold regular meetings normally 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.