



2010 ANNUAL DRINKING WATER QUALITY REPORT

PWS ID# "03-92-010"

The City of Raleigh is pleased to present our Annual Water Quality Report for 2010. The Safe Drinking Water Act (SDWA) requires that the City of Raleigh provide this report to all of its customers on an annual basis. The Public Utilities Department of the City of Raleigh is proud to document that its drinking water meets all Federal and State standards as required by the U.S. Environmental Protection Agency (USEPA) with no violations during January through December of 2010.

City of Raleigh Senior Staff: From lower left, John Carman, PUD Director, Russell Allen, City Manger, Robert Massengill, Assistant PUD Director, Kenneth Waldroup, Assistant PUD Director, Donna Jackson, PUD Assistant Director

How Your Water is Treated and Distributed

The treatment process consists of a series of steps. After the raw water is pumped to either the E.M. Johnson Water Treatment Plant or the Dempsey E. Benton Water Treatment Plant, it goes through a treatment process which includes coagulation, sedimentation, filtration, and disinfection to ensure that the water is safe to drink when it reaches the customers.

In March of each year, Raleigh stops the addition of ammonia and uses chlorine alone, as its disinfectant. During this period, Raleigh water customers may taste and smell the chlorine in the water they receive without ammonia. Ammonia masks the taste and odor of the chlorine during the remaining 11 months of the year.

Once the water has been treated at one of the treatment plants, it is pumped through approximately 2,500 miles of water transmission and distribution mains. There are 9 elevation zones in the distribution system. These elevation zones receive water from 22 booster pump stations and include 26 elevated and above ground storage tanks.

All municipal water systems, including Raleigh's, are sized for fire protection demands by using elevated water storage tanks. Although necessary for fire protection, the system sizing can negatively impact water quality during low customer demand periods, which must be addressed by hydrant flushing. During hot, dry weather conditions, the demand for water by Raleigh's customers causes the speed that water travels through the distribution system to increase significantly. This increase may sometimes cause brief, temporary periods of discoloration of the water. Water main breaks or leaks can also cause water discoloration.

We routinely monitor for over 150 contaminants in your drinking water according to Federal and State laws. The tables in this report lists all the drinking water contaminants that we detected in the last round of sampling for the particular contaminant group. The presence of contaminants does not necessarily indicate that water poses a health risk. **Unless otherwise noted, the data presented in this table is from testing done January 1, 2010 through December 31, 2010.** The EPA or the State requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data, though representative of the water quality, is more than one year old.

When You Turn on Your Tap, Consider the Source

Raleigh uses surface water from Falls Lake and Lake Benson as its sources for drinking water. The two reservoirs hold a combined 16.2 billion gallons of water and can provide Raleigh with up to 120 million gallons of water a day to serve approximately 177,000 metered customers and a service population of approximately 485,000 people. In an effort to protect our water supply resources, the City of Raleigh created the Upper Neuse Clean Water Initiative to help fund land purchases in and around the Falls Lake watershed. These lands will be kept as undeveloped tracks to help maintain and enhance water quality in Falls Lake. Since 2005, the City of Raleigh has designated \$6,000,000 for these land acquisition projects.



EM Johnson Water Treatment Plant



MICROBIOLOGICAL CONTAMINANTS

Contaminant (units)	MCL Violation Y/N	Your Water	MCLG	MCL	Likely Source of Contamination
Total Coliform Bacteria (presence or absence)	N	0.81% were positive	0	5% of monthly samples are positive	Naturally present in the environment
Fecal Coliform or E. Coli (presence or absence)	N	0	0	0 (Note: The MCL is exceeded if a routine sample and repeat sample are total coliform positive, and one is also fecal coliform or E. coli positive)	Human and animal fecal waste

DISINFECTANTS AND DISINFECTION BYPRODUCTS CONTAMINANTS

Contaminant (units)	MCL/MRDL Violation Y/N	Your Water (AVG)	Range Low High	MCLG	MCL	Likely Source of Contamination
TTHM (ppb) [Total Trihalomethanes]	N	32.6	6.40 - 46.3	N/A	80	By-product of drinking water chlorination
HAA5 (ppb) [Total Haloacetic Acids]	N	26.7	9.60 - 45.1	N/A	60	By-product of drinking water disinfection
Chloramines (ppm)	N	2.89	0.1 - 4.3	MRDLG = 4	MRDL = 4	Water additive used to control microbes
Chlorine (ppm)	N	1.63	0.19 - 2.80	MRDLG = 4	MRDL = 4	Water additive used to control microbes

UNREGULATED CONTAMINANTS UCMR2 Unregulated contaminants are those for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted.

Contaminant (units)	MRL	Your Water (AVG)	Range Low High	Use or Environmental Source
N-nitroso-dimethylamine (NDMA), (ug/L)	0.002	0.005	0.002 - 0.013	Nitrosamines can form as intermediates and byproducts in chemical synthesis and manufacture of rubber, leather, and plastics; can form spontaneously by reaction of precursor amines with nitrosating agents (nitrate and related compounds), or by action of nitrate-reducing bacteria. Foods such as bacon and malt beverages can contain nitrosamines; there also is evidence that they form in the upper GI tract

Please note that no detection of NDMA was found in The City of Raleigh finished water. The above detection was at the distribution system maximum residence time samplin point associated with each water plant.

UNREGULATED INORGANIC CONTAMINANTS

Contaminant (units)	Sample Date	Your Water	Range Low High	Secondary MCL
Sulfate (ppm)	1/28/2010	52.0	N/A	250

WATER CHARACTERISTICS CONTAMINANTS

Contaminant (units)	Sample Date	Your Water	Range Low High	Secondary MCL
Sodium (ppm)	1/16/2010	34.0	N/A	N/A
ph	2010	8.37	8.3 - 8.4	6.5 to 8.5
Alkalinity, ppm	2010	28.9	18.3 - 42.2	N/A
Hardness, ppm	2010	25.7	21.0 - 30.2	N/A



The City of Raleigh's E.M. Johnson Water Treatment Plant performs sufficient testing to ensure the safety of your drinking water. The drinking water laboratory at the water treatment plant has certification and approval from the State of North Carolina and the USEPA to perform water quality analysis. In 2010, staff chemists and technicians at the drinking water laboratory collected, tested and analyzed Raleigh's drinking water between 6,000 and 7,000 times a month for many substances such as trace metals, petroleum products, pesticides and bacteria. During 2010, the City of Raleigh was in compliance with all national Primary Drinking Water Regulations.

INORGANIC CONTAMINANTS

Contaminant (units)	Sample Date	MCL Violation Y/N	Your Water	Range Low High	MCLG	MCL	Likely Source of Contamination
Fluoride (ppm)	1/28/2010	N	0.94	N/A	4	4	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories

LEAD AND COPPER CONTAMINANTS

Contaminant (units)	Sample Date	Your Water	# of sites found above the AL	MCLG	MCL	Likely Source of Contamination
Copper (ppm) (90th percentile)	2010	0.05	0	1.3	AL = 1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Lead (ppb) (90th percentile)	2010	< 3	0	0	AL = 15	Corrosion of household plumbing systems; erosion of natural deposits

DISINFECTION BYPRODUCT PRECURSORS CONTAMINANTS

Contaminant (units)	TT Violation Y/N	Your Water (RAA Removal Ratio)	Range Monthly Removal Ratio Low-High	MCLG	MCL	Compliance Method (Step 1 or ACC#)	Likely Source of Contamination
Total Organic Carbon (removal ratio) (TOC) - TREATED	N	1.42	1.28 - 1.56	N/A	TT	Step 1	Naturally present in the environment, and high bio-mass concentration.

Note: Depending on the TOC in our source water, the system MUST have a certain % removal of TOC or must achieve alternative compliance criteria. If we do not achieve that % removal, there is an alternative % removal. If we fail to meet the alternative % removal, we are in violation of a Treatment Technique.

*TURBIDITY

Contaminant (units)	MCL Violation Y/N	Your Water	MCLG	MCL	Likely Source of Contamination
Turbidity (NTU)	N	0.14	N/A	TT = 1 NTU	Soil runoff
		100%		TT = percentage of samples ≤ 0.3 NTU	

* Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system. The turbidity rule requires that 95% or more of the monthly samples must be less than or equal to 0.3 NTU.

DE Benton Water Treatment Plant



In April of 2010, the Raleigh Public Utilities Department began operation of the new Dempsey E. Benton Water Treatment Plant located in Garner, NC. The plant is designed to treat up to 20 million gallons per day, and will draw water from Lake Benson with additional upstream water storage in Lake Wheeler. This additional water supply provides the City of Raleigh and surrounding service areas with a valuable second source of drinking water and help meet future water demands.

Keeping your drinking water safe.

Backflow Preventer Assemblies protect the potable water supply by allowing water to flow in one direction to prevent potential backsiphonage or backpressure of pollutants or contaminants from entering the public water supply. All commercial connections including domestic, fire and lawn irrigation are required to have a backflow assembly installed and tested annually. Every residential irrigation system is required to have a backflow assembly installed and tested every three years. If you would like to know more about backflow prevention please call, (919) 857-4540.

GET THE LEAD OUT!

In addition to the information found on the 2010 Consumer Confidence Report, City of Raleigh drinking water customers should also take steps to reduce the potential exposure to lead within the household.

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 Raleigh 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 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 or at <http://www.epa.gov/safewater/lead>.

RADIOACTIVE CONTAMINANTS

Contaminant (units)	Sample Date	MCL Violation Y/N	Your Water	MCLG	MCL	Likely Source of Contamination
Beta/photon emitters (pCi/L)	2010	N	29.1	0	50	Decay on natural and man-made deposits
Combined Radium (pCi/L)	2010	N	1.4	0	5	Erosion of natural deposits

TURBIDITY

Contaminant (units)	MCL Violation Y/N	Your Water	MCLG	MCL	Likely Source of Contamination
Turbidity (NTU)	N	0.25	N/A	TT = 1 NTU	Soil runoff
		100%		TT = percentage of samples ≤ 0.3 NTU	

INORGANIC CONTAMINANTS

Contaminant (units)	Sample Date	MCL Violation Y/N	Your Water	Range Low High	MCLG	MCL	Likely Source of Contamination
Fluoride (ppm)	5/18/2010	N	0.94	N/A	4	4	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories

UNREGULATED INORGANIC CONTAMINANTS

Contaminant (units)	Sample Date	Your Water	Range Low High	Secondary MCL
Sulfate (ppm)	5/18/2010	39.0	N/A	250

DISINFECTION BYPRODUCT PRECURSORS CONTAMINANTS

Contaminant (units)	TT Violation Y/N	Your Water (RAA Removal Ratio)	Range Monthly Removal Ratio Low-High	MCLG	MCL	Compliance Method (Step 1 or ACC#)	Likely Source of Contamination
Total Organic Carbon (removal ratio) (TOC) - TREATED	N	1.73	1.47 - 1.88	N/A	TT	Step 1	Naturally present in the environment

WATER CHARACTERISTICS CONTAMINANTS

Contaminant (units)	Sample Date	Your Water	Range Low High	Secondary MCL
Sodium (ppm)	5/18/2010	14.0	N/A	N/A
ph	2010	8.43	8.27 - 8.72	6.5 to 8.5
Alkalinity, ppm	2010	23.5	19.7 - 27.9	N/A
Hardness, ppm	2010	71.7	54.5 - 83.4	N/A



Lake Benson raw water pump station near hwy 50 in Garner, NC.
Photo by: Frank Hewett

Unregulated contaminants are those for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted.

Not-Applicable (N/A) – Information not applicable/not required for that particular water system or for that particular Rule.

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.

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

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 Residual Disinfection Level Goal – The “Level” (MRDLG) 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 contaminants.

Maximum Residual Disinfection Level – The “Highest Level” (MRDL) of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

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.

Extra Note: *MCLs 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.*

Cryptosporidium: Cryptosporidium is a microorganism that can cause intestinal illness. The City of Raleigh voluntarily tests for Cryptosporidium and DID NOT detect Cryptosporidium in its water in 2010.

MTBE: The City of Raleigh also tested for Methyl tert-butyl ether (MTBE) and found it to be below the detection limit of 5 ppb for MTBE. At this time no limit for MTBE has been established, however the EPA is considering a limit of 30 ppb.

Radon: Radon is a radioactive gas that you can't see, taste, or smell. It is found naturally occurring throughout the U.S. EPA expects to issue a Radon Rule, which will set a standard for Radon in drinking water. The City of Raleigh tested for Radon in its finished water and found it to be <100 pCi/L. There is no current MCL for Radon. However, the EPA is considering a MCL of 300 pCi/L.

What EPA Wants You to Know

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).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised 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).

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, in some cases, 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, inorganic contaminants, pesticides and herbicides, organic chemical contaminants and radiological contaminants.

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.



*Source Water Assessment
Program
(SWAP) Results*

The North Carolina Department of Environment and Natural Resources (DENR), Public Water Supply (PWS) Section, Source Water Assessment Program (SWAP) conducted assessments for all drinking water sources across North Carolina. The purpose of the assessments was to determine the susceptibility of each drinking water source (well or surface water intake) to Potential Contaminant Sources (PCSs). The results of the assessment are available in SWAP Assessment Reports that include maps, background information and a relative susceptibility rating of Higher, Moderate or Lower.

The relative susceptibility rating of each source for the City of Raleigh was determined by combining the contaminant rating (number and location of PCSs within the assessment area) and the inherent vulnerability rating (i.e., characteristics or existing conditions of the well or watershed and its delineated assessment area.). The assessment findings are summarized in the table below:

**Susceptibility of Sources to Potential
Contaminant Sources
(PCSs)**

Source Name	Susceptibility Rating
Falls Lake	Higher
Lake Benson	Higher

It is important to understand that a susceptibility rating of "higher" does not imply poor water quality; only the system's potential to become contaminated by PCSs in the assessment area.

The complete SWAP Assessment report for the City of Raleigh may be viewed on the web at: <http://www.deh.enr.state.nc.us/pws/swap>. To obtain a printed copy of this report, please mail a written request to: Source Water Assessment Program – Report Request, 1634 Mail Service Center, Raleigh NC 27699-1634, or email requests to swap@ncmail.net. Please indicate your system name, PWS ID# 03-92-010, and provide your name, mailing address and phone number. If you have any questions about the SWAP report, please contact the Source Water Assessment staff by phone at (919) 715-2633.

Conservation & Efficiency

As the 2007 drought clearly demonstrated, our drinking water is our most precious and valuable resource. So while the severe drought conditions have dissipated, it is still critically important that the citizens of the City of Raleigh continue to conserve water. Therefore, the City has initiated several programs and policies to help use our water wisely.

- Water shortage Response Planning: The City has created a Plan in case of drought that will implement conservation stages to reduce water using activities. This plan is available on the city's website.
- WaterSense Toilet Rebate Program: the City has replaced approximately 6,000 toilets, flushometers and urinals to ensure that our water is used as efficiently as possible.
- Showerhead and aerator swap out program: Did you know that showerheads and aerators can account for up to 17 and 15 percent, respectively? Swap out inefficient fixtures for a high efficiency model, offered by the City for FREE!

Here are a few ways that you can help with the City's water conservation and efficiency efforts.

- Conduct a Home Water Audit and see how efficient your home is. Visit the City's website for a How-To Manual!
- Check your home or business for leaks, most homes have leaks without anyone ever knowing. See our website for our Fix-a-Leak Brochure!
- Consider retrofitting old appliances and fixtures with ones that carry the WaterSense label; WaterSense labeled products are independently tested for high performance and 20 percent water savings over the current standard.
- Replace large turf areas with drought tolerant grasses that need less water, or convert some of the area into a flowerbed which won't need as much irrigation.
- Go WaterWise, by installing WaterWise plants. See the City's WaterWise Demonstration Garden at 310 West Martin Street, for ideas on what your garden could look like!



Contact the Public Utilities Department for more information,
919.857.4540 or www.raleighnc.gov.



Upper Falls Lake at I-85, drought of 2007.
Photo by: Frank Hewett

