



## PUBLIC UTILITIES DEPARTMENT

# 2011 ANNUAL DRINKING WATER QUALITY REPORT

**PWS ID# "03-92-010"**

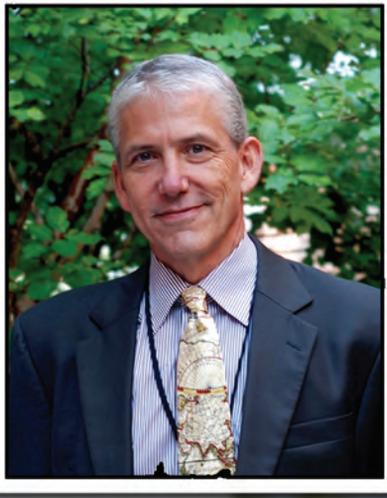
The City of Raleigh is pleased to present our Annual Water Quality Report for 2011. The Safe Drinking Water Act (SDWA) requires that the City of Raleigh provide this report to all of its customers on an annual basis. The Public Utilities Department of the City of Raleigh is proud to document that its 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 2011.



## SERVING

Garner • Knightdale • Raleigh • Rolesville

Wake Forest • Wendell • Zebulon



*City of Raleigh's  
Public Utilities Director*  
**John Robert Carman**

## *From the Deck of Director:*

It is my pleasure to present to you Raleigh Public Utilities Annual Water Quality Report for 2011. The Safe Drinking Water Act (SDWA) requires that this report be made available to all of our customers on an annual basis. We are proud to document that our drinking water meets all Federal and State quality standards as required by law with NO violations from January, 2011 through December of 2011.

Last year was a challenging year for the utility as it was for many of our customers. Revenue shortfalls resulting from the economic downturn and ongoing improvements in water use efficiency have challenged the utility to do more with less. Even in the face of these economic headwinds, our unrelenting commitment to water quality for our customers is evident in the attached report.

The Raleigh City Council created a task force to study the utility business model and make recommendations for managing the utility through the changes our community is experiencing. This taskforce recommended a set of guiding principles for the utility that address all aspects of effective and sustainable utility management. These guiding principles are grouped in-to seven primary areas:

- 1. Strategic Planning**
- 2. Water Infrastructure Planning and Management**
- 3. Environmental Stewardship**
- 4. Financial Policy and Planning**
- 5. Operations Management**
- 6. Customer Education and Support**
- 7. Implementation Policy**

These guiding principles and the specific action items associated with them have been incorporated in our utilities strategic master plan, and we have begun the implementation of that plan.

Please take a few moments to look through this report and see for yourself what great water quality we enjoy here in Garner, Knightdale, Raleigh, Rolesville, Wake Forest, Wendell and Zebulon. If you have any questions, please don't hesitate to give us a call at (919) 996-4540.

Carman



WAKE FOREST

ROLESVILLE

ZEBULON

WENDELL

KNIGHTDALE

RALEIGH

GARNER

EMJ WTP

DE Benton WTP

## 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 106 million gallons of water a day to serve approximately 177,000 metered customers and a service population of approximately 489,000 people. In an effort to protect critical water resources, the City of Raleigh created the Upper Neuse Clean Water Initiative to help fund land purchases in and around the City's drinking water supplies. These lands will be kept as undeveloped tracks to help maintain and enhance water quality. Since 2005, the City of Raleigh has designated approximately \$7,000,000 for these land acquisition projects.

## 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.*



## 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 nine 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.

## 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.



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 2011, staff chemists, microbiologist 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 2011, the City of Raleigh was in compliance with all national Primary Drinking Water Regulations.

## GLOSSARY OF TERMS

**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 2011.

**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.



# E. M. Johnson Water Treatment Plant *\*Please see "Glossary of Terms for abbreviations on the charts below.*

## MICROBIOLOGICAL CONTAMINANTS

Contaminant (units)	MCL Violation Y/N	Your Water	MCLG	MCL	Like Source of Contamination
Total Coliform Bacteria (presence or absence)	N	0.17% were positive	0	5% of monthly samples are positive	Naturally present in the environment
Fecal Coliform or E. Coli (presence or absence)	N	0.03% were positive	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

## TURBIDITY

Contaminant (units)	MCL Violation Y/N	Your Water	MCLG	MCL	Like Source of Contamination
Turbidity (NTU)	N	0.17 100%	N/A	TT = 1 NTU TT = percentage of samples ≤ 0.3 NTU	Soil runoff

## SYNTHETIC ORGANIC CHEMICAL (SOC) CONTAMINANTS INCLUDING PESTICIDES AND HERBICIDES

Contaminant (units)	Sample Date	MCL Violation Y/N	Your Water	Range Low High	MCLG	MCL	Like Source of Contamination
Simazine (ppb)	2011	N	0.04	ND - 0.08	4	4	Herbicide runoff
Di(2-ethylhexyl) phthalate (ppb)	2011	N	0.50	ND - 2.0	0	6	Discharge from rubber and chemical factories

## DISINFECTANTS AND DISINFECTION BYPRODUCTS CONTAMINANTS

Contaminant (units)	MCL/MRDL Violation Y/N	Your Water (AVG)	Range Low High	MCLG	MCL	Like Source of Contamination
THM (ppb) [Total Trihalomethanes]	N	33.7	13.3 - 75.6	N/A	80	By-product of drinking water chlorination
HAA5 (ppb) [Total Haloacetic Acids]	N	15.2	7.3 - 32	N/A	60	By-product of drinking water disinfection
Chloramines (ppm)	N	3.20	0.1 - 4.0	MRDLG = 4	MRDL = 4	Water additive used to control microbes
Chlorine (ppm) March	N	1.93	0.07 - 3.70	MRDLG = 4	MRDL = 4	Water additive used to control microbes

## INORGANIC CONTAMINANTS

Contaminant (units)	Sample Date	MCL Violation Y/N	Your Water	Range Low High	MCLG	MCL	Like Source of Contamination
Fluoride (ppm)	2/15/2011	N	0.84	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	Like 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 ACCH)	Likely Source of Contamination
Total Organic Carbon (removal ratio) (TOC) - TREATED	N	1.25	1.11 - 1.35	N/A	TT	Step 1	Naturally present in the environment and excessive biomass loading

## WATER CHARACTERISTICS CONTAMINANTS

Contaminant (units)	Sample Date	Your Water	Range Low High	Secondary MCL
Sodium (ppm)	2/3/2011	25.0	N/A	N/A
pH, SU	2011	8.36	8.2 - 8.4	6.5 to 8.5
Alkalinity, ppm	2011	38.3	29.1 - 45.6	N/A
Hardness, ppm	2011	31.9	27.3 - 34.9	N/A

## UNREGULATED INORGANIC CONTAMINANTS

Contaminant (units)	Sample Date	Your Water	Range Low High	Secondary MCL
Sulfate (ppm)	1/24/2011	32.0	N/A	250

**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.**

## Keeping your drinking water safe

**B**ackflow 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) 212-5923.



# D.E. Benton Water Treatment Plant

\*Please see "Glossary of Terms for abbreviations on the charts below.

## TURBIDITY

Contaminant (units)	MCL Violation Y/N	Your Water	MCLG	MCL	Like Source of Contamination
Turbidity (NTU)	N	0.18	N/A	TT = 1 NTU	Soil runoff
		100%		TT = percentage of samples $\leq$ 0.3 NTU	

## INORGANIC CONTAMINANTS

Contaminant (units)	Sample Date	MCL Violation Y/N	Your Water	Range Low High	MCLG	MCL	Like Source of Contamination
Fluoride (ppm)	1/24/2011	N	0.79	N/A	4	4	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories

## RADIOACTIVE CONTAMINANTS

Contaminant (units)	Sample Date	MCL Violation Y/N	Your Water	MCLG	MCL	Like Source of Contamination
Combined Radium (pCi/L)	2/9/2011	N	0.4	0	5	Erosion on 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	1.61	1.45 - 1.74	N/A	TT	Step 1	Naturally present in the environment and excessive biomass loading

## WATER CHARACTERISTICS CONTAMINANTS

Contaminant (units)	Sample Date	Your Water	Range Low High	Secondary MCL
Sodium (ppm)	2/3/2011	12.0	N/A	N/A
pH, SU	2011	8.52	8.27 - 8.87	6.5 to 8.5
Alkalinity, ppm	2011	27.7	21.6 - 37.1	N/A
Hardness, ppm	2011	73.0	62.7 - 88.7	N/A

## UNREGULATED INORGANIC CONTAMINANTS

Contaminant (units)	Sample Date	Your Water	Range Low High	Secondary MCL
Sulfate (ppm)	1/24/2011	53.5	N/A	250

## GET THE LEAD OUT!

In addition to the information found on the 2011 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 [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).



## 'Efficiency' and 'Conservation'

While parts of North Carolina is still experiencing "Abnormally Dry" conditions, Falls Lake is currently full. The summer forecast, like most summers, predicts equal chances for rain or dry weather. Therefore, the City would like it's water customers to be efficient with their water usage; allowing for effective conservation responses if and when dry conditions occur.

Efficiency and conservation are often used interchangeably; however, they do have subtle differences. Water efficiency generally refers to technological changes such as upgrading to a high efficiency showerhead. Water conservation on the other hand reflects behavioral changes such as taking shorter showers.

The City of Raleigh has been utilizing it's educational programs to inform customers about our water resources, our water policies and ways that citizens can contribute to using our resources in a sustainable manner. It is important to utilize our resources as efficiently as possible; however, urging conservation when our reservoirs are full can actually hinder conservation responses when drought occurs and conservation is desperately needed. Therefore, the City has been evaluating current policies and modifying certain areas.

## Change in Permanent Conservation Measures: Alternate Irrigation Days

Effective May 1, 2012, the alternate day outdoor irrigation restrictions have been removed so that outdoor irrigation is permitted on any day of the week while the Permanent Conservation Measures are in effect. The alternate day irrigation policy is now a voluntary practice, and the City of Raleigh still encourages customers to be efficient with their water use. Please visit our website at [www.raleighnc.gov](http://www.raleighnc.gov) and use the keywords "water conservation tips" in the search box to find out more about water conservation and efficiency practices. Please note this modification does not change the Stage 1, Stage 2, Stage 3 water use restrictions as described in the Water Shortage Response Plan.

## Water Efficiency Incentives

Did you know that showerheads and aerators can account for up to 17 and 15 percent, respectively?

The City currently offers several efficiency incentives: **FREE Flow-wise faucet aerators**, **FREE Flow-wise showerhead swap-out**, **FREE leak detection dye tablets**, and **FREE Flow-measuring bags**. Come to the Public Utilities main office location to pick up your free aerators, showerhead, and toilet rebate application.

## WaterSense Toilet Rebate Program

While the rebate program has ended for this fiscal year, it will restart on August 1st, 2012. This program has been a great success and utilized by many of Raleigh's homes, businesses, and even academic institutions. Through this program, the City has replaced over 9,956 toilets, flushometers and/or urinals; these efforts are ensuring that our water is used as efficiently as possible.

## Donna Jackson Trailblazer Award: "Our Water, Our Future"

This year the City of Raleigh offered a new award category under in the Environmental Awards ceremony. This award recognizes Jackson's 28 years of service to the City of Raleigh.

The award recognizes local college, university, and technical school students who have showcased their creativity and talent by producing an original 30-second video public service announcement focusing on water and environmental stewardship. First Place winner was Eric Hunsley with "Our Water, Our Future", and Second Place awards went to Jonathan Dockery & Anthony Purnell for "Water Investigations Unit" Please visit the City of Raleigh's YouTube site to see all videos.

## To Become More Involved or for Answers to Questions

The Raleigh City Council meets most months on the first and third Tuesday at 1:00 p.m. in the Avery C. Upchurch Municipal Complex at 222 W. Hargett Street.

## See a Water Problem?

Please call the City of Raleigh Public Utilities Department to report a water main break or sanitary sewer backup or overflow. To report a main break or sewer backup/overflow during normal **business hours (M-F, 7:30 a.m. – 5:00 p.m.)** please call **(919) 996-4540**. When calling at times other than normal business hours, please dial the after-hours emergency number **(919) 996-1930**. Thanks for your help!

The City of Raleigh  
Public Utilities Department  
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