

# 2012 CONSUMER CONFIDENCE REPORT



## The City of Raleigh

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

The City of Raleigh is pleased to present our Annual Water Quality Report for 2012. The Safe Drinking Water Act (SDWA) requires that the City of Raleigh make this report available 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 2012.

## 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 170,000 metered customers and a service population of approximately 500,000 people located in Raleigh, Knightdale, Zebulon, Wendell, Rolesville, Garner, and Wake Forest. In an effort to protect these 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 2006, the City of Raleigh has designated approximately \$9,000,000 for these land acquisition projects, resulting in the permanent preservation of over 63 miles of streams and 6,170 acres in the Falls Lake and Lake Benson watersheds.



Falls Lake

## 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.*

## From the Desk of the Director

The Public Utilities Department has recently developed a Strategic Plan to help define the future direction of the organization and create a road map for making resource allocation decisions that take us where we want to go. With many challenges and limited resources, we make investment decisions for the utility every day. The Strategic Plan will help us decide how to optimize our investments in our people, work processes and the tools needed to do the job of providing our customers with world class service.

Strategic Planning has a long track record of success in private industry, with every major and most minor corporations implementing and constantly updating Strategic Plans. Large regional utilities have long recognized the value of strategic planning efforts in optimizing service delivery for utility customers.

Using the Environmental Protection Agency's "Effective Utility Management" guidance document, eight areas of development or improvement were identified, which are as follows:

1. Customer Service
2. Employee & Leadership Development
3. Environmental Stewardship
4. Financial Viability
5. Operational Optimization
6. Reliability
7. Stakeholder Outreach
8. Water Resource Management



These development areas will serve as focal points of the Strategic Plan, and our goal is to have the critical elements of the plan implemented by 2014. For more information on the Strategic Plan, please contact Carolyn Dumas at [Carolyn.dumas@raleighnc.gov](mailto:Carolyn.dumas@raleighnc.gov) or 919-996-3473.

Sincerely,

John Carman



Raw Water Pump Station at Falls Lake



Dempsey E. Benton Pump Gallery

## 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. Ammonia masks the taste and odor of the chlorine during the remaining 11 months of the year.

## 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 contaminants 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.

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 2012, 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 2012, 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.

## EM Johnson Water Treatment Plant

### 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%	0	5% of monthly samples are positive	Naturally present in the environment
Fecal Coliform or E. Coli (presence or absence)	N	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

### TURBIDITY

Contaminant (units)	Treatment Technique (TT) Violation Y/N	Your Water	Treatment Technique (TT) Violation if:	Like Source of Contamination
Turbidity (NTU) - Highest single turbidity measurement	N	0.15	Turbidity > 1 NTU	Soil runoff
Turbidity (NTU) - Lowest monthly percentage (%) of samples meeting turbidity limits	N	100%	Less than 95% of monthly turbidity measurements are ≤ 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)	1/17/2012	N	0.62	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)	1/17/2012	50.3	N/A	250

**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 2012.

#### 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	TT	Compliance Method (Step 1 or ACC#)	Likely Source of Contamination
Total Organic Carbon (removal ratio) (TOC) - TREATED	N	1.34	1.25 - 1.47	N/A	TT	Step 1	Naturally present in the environment

#### DISINFECTANTS AND DISINFECTION BYPRODUCTS CONTAMINANTS

Contaminant (units)	MCL/MRDL Violation Y/N	Your Water (AVG)	Range Low High	MCLG	MCL	Like Source of Contamination
TTHM (ppb) [Total Trihalomethanes]	N	34.0	15.2 - 53.7	N/A	80	By-product of drinking water chlorination
HAA5 (ppb) [Total Haloacetic Acids]	N	16.8	5.10 - 29.7	N/A	60	By-product of drinking water disinfection
Chloramines (ppm)	N	3.00	0.1 - 3.9	MRDLG = 4	MRDL = 4	Water additive used to control microbes
Chlorine (ppm) March	N	2.13	0.04 - 3.4	MRDLG = 4	MRDL = 4	Water additive used to control microbes

#### WATER CHARACTERISTICS CONTAMINANTS

Contaminant (units)	Sample Date	Your Water	Range Low High	Secondary MCL
Sodium (ppm)	1/24/2012	34.0	N/A	N/A
pH, SU	2012	8.38	8.30 - 8.50	6.5 to 8.5
Alkalinity, ppm	2012	37.8	33.8 - 43.6	N/A
Hardness, ppm	2012	32.5	31.3 - 34.1	N/A
Iron (ppm)	1/17/2012	0.06	NA	0.3

**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.

## DE Benton Water Treatment Plant

### TURBIDITY

Contaminant (units)	Treatment Technique (TT) Violation Y/N	Your Water	Treatment Technique (TT) Violation if:	Like Source of Contamination
Turbidity (NTU) - Highest single turbidity measurement	N	0.16	Turbidity > 1 NTU	Soil runoff
Turbidity (NTU) - Lowest monthly percentage (%) of samples meeting turbidity limits	N	100%	Less than 95% of monthly turbidity measurements are ≤ 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)	1/17/2012	N	0.73	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)	1/17/2012	46.8	N/A	250

### RADIOACTIVE CONTAMINANTS

Contaminant (units)	Sample Date	MCL Violation Y/N	Your Water	MCLG	MCL	Like Source of Contamination
Combined Radium (pCi/L)	2/6/2011	N	0.4	0	5	Erosion on natural deposits



Backflow Assembly

## 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 919-996-5923

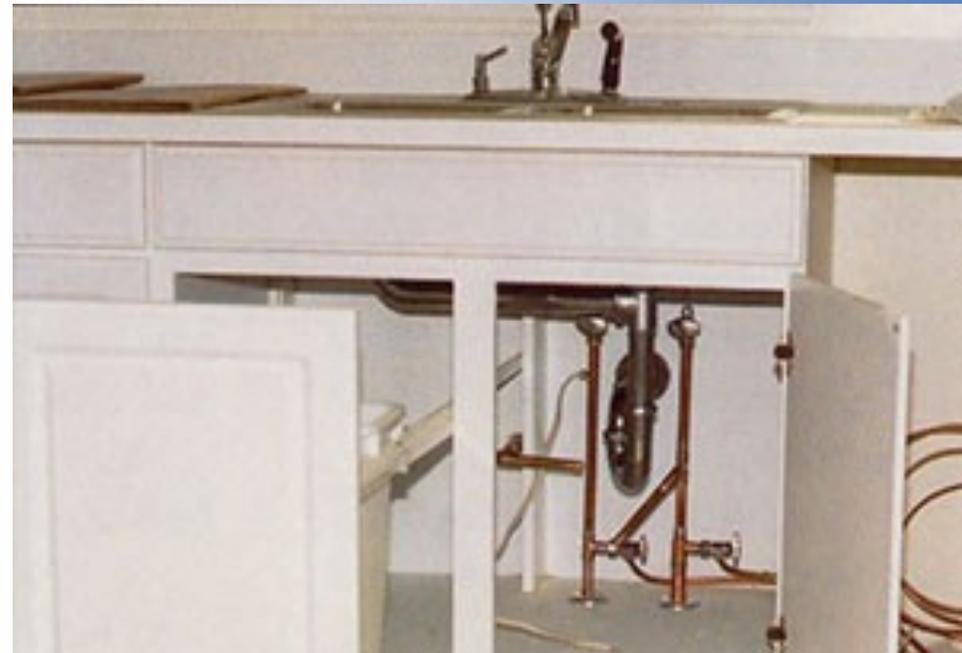
## GET THE LEAD OUT!

In addition to the information found on the 2012 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).

**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.

## Copper Plumbing With Lead Solder

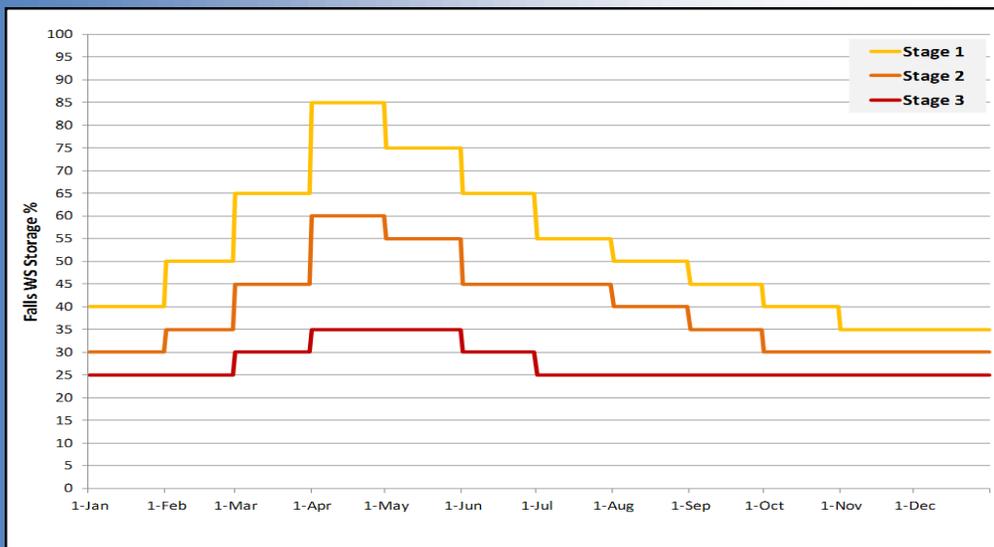


## Seasonal Triggers For Water Shortage Response Plan

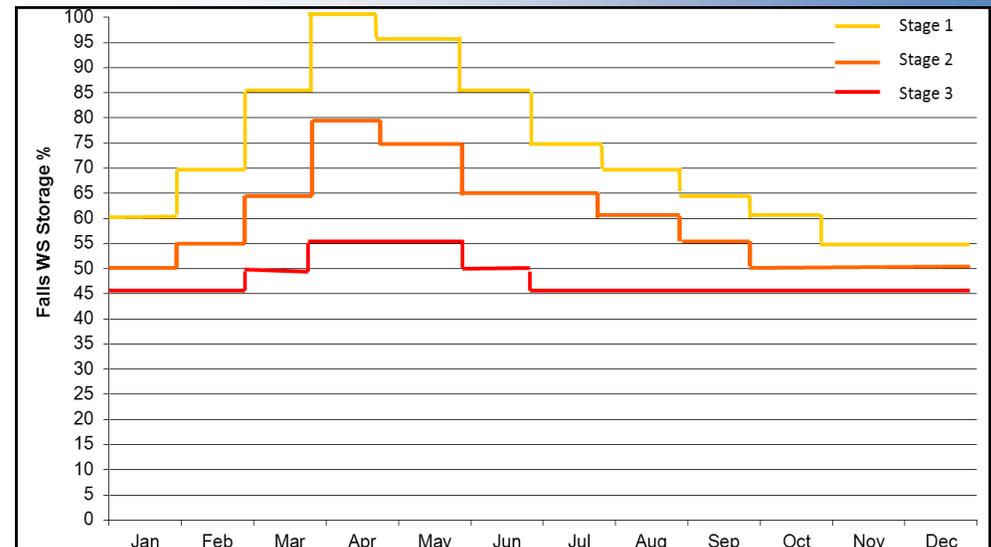
In reviewing the City's Water Shortage Response Plan (WSRP) and recent severe drought events, it became clear the previous non-seasonal water use restriction triggers did not take normal seasonal water level variations into account. This in turn could result in the automatic implementation of water use restrictions when it may not be required, or conversely delay the implementation of a water use restriction when it would be highly beneficial. By way of example, it is not unusual for the water supply pool at Falls Lake to be below 50% in early November, which under the previous non-seasonal system would require entering into Stage 1 water use restrictions even though there is an extremely high likelihood the reservoir will refill over the winter months. In this case, such a scenario would not only unnecessarily alarm customers, it would likely result in a significant loss of revenue due to water use restrictions and the subsequent conservation response. Whereas the opposite is true in the event the water supply pool is at 60% remaining on April 1st, which would not necessarily result in the adoption of water use restrictions and thereby put drinking water supplies at risk if restorative precipitation events do not occur in the spring.

Thus, using the OASIS hydrologic model, which is based on over 80 years of hydrologic records for the Upper Neuse River Basin, a new seasonal trigger system was developed and adopted on July 26, 2012. The seasonal triggers will greatly improve the City's ability to efficiently manage the available drinking water supplies, as they have lower trigger levels prior to the traditional refill cycle and higher trigger levels prior to the traditional drawdown cycle in late spring. Assuming an average demand of 60 million gallons per day and maximizing the withdrawal from Lake Benson, the seasonal system would result in implementing water use restriction once every eight years, compared to the non-seasonal system which would require water use restrictions once every four years. Likewise, the rescission triggers were also modified to use a seasonal approach – please see the graphs listed below for specific monthly trigger information:

### IMPLEMENTATION TRIGGERS



### RESCISSION TRIGGERS



## Donna Jackson Trailblazer Award: “Our Water, Our Future”



This is the second year that the Public Utilities Department has sponsored the Emerging Professionals PSA Competition--the Donna Jackson Trailblazer Award. Named in recognition of Donna Jackson’s 28 years of service to the City of Raleigh; she demonstrated creativity in her performance, dedication to leadership, and professional commitment to public service. Mrs. Jackson made a significant impact on the civil engineering community and is a role model for the next generation of engineering leaders. This award recognizes local college, university and technical school students who showcase their creativity and talent by producing an original 30-second and/or 60-second video public service announcement focusing this year on *Repairing Leaky Toilets*, one of the many reasons customers experience high water bills.

First Place 30-second video: \$750.00

Wei Wang and Robert Smith, NCSU College of Natural Resources, “Fix Leaks to Conserve”

First Place 60-second video: \$750.00

Wei Wang and Robert Smith, NCSU College of Natural Resources, “Fix Leaky Toilets—It’s Simple”

## ‘Efficiency’ and ‘Conservation’

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 needed.

## Water Efficiency Incentives

Did you know that showerheads and aerators can account for up to 32% of domestic water use, 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 and showerhead. The main office address is One Exchange Plaza, Suite 620, Raleigh, NC 27602.

## To Become More Involved or for Answers to Questions

Join your local Citizens Advisory Council of one of the volunteer City boards or committees. 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!