

THE CITY OF RALEIGH



CONSUMER CONFIDENCE REPORT

2024

Raleigh Water Mission Statement:

To provide inclusive, safe, and sustainable water services to our diverse community while equitably protecting public health and contributing to our service area's economic, environmental, and social vitality.

SYSTEM ID: 03-92-010

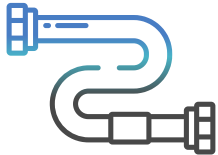


THE CITY OF RALEIGH

PROUDLY PROVIDING DRINKING WATER SERVICES TO RALEIGH, WAKE FOREST, ROLESVILLE, GARNER, WENDELL, KNIGHTDALE AND ZEBULON

We are pleased to provide the 2024 Consumer Confidence Report, which is a summary of last year's drinking water quality. Included are details about your sources of water, what it contains, and how it compares to standards set by regulatory agencies. Our goal is to provide you with a safe and dependable supply of drinking water. We do this by investing in our infrastructure, integrating new technology into our processes and complying with industry programs that go above and beyond regulatory requirements.

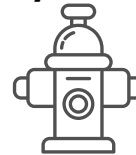
**~2,600 miles of
water line**



**water services to
~650,000 residents**



**over 26,000 fire
hydrants**



**27 elevated water
storage tanks**



Every day we provide critical drinking water services to approximately 650,000 residents and help support over \$120 billion in economic activity in Raleigh. This service requires the operation and maintenance of 2 water treatment plants, 27 elevated water storage tanks, ~2,600 miles of water line, ~70,000 water valves and over 26,000 fire hydrants. Here are a few highlights from 2024:

**Treated ~18.9
billion
gallons of
water**



**Opened a new
Drinking Water
Compliance
Laboratory**



**Awarded "Best
Tasting Water" in NC
at the One Water
Conference in 2022 &
2023**



Replaced 9,531 meters

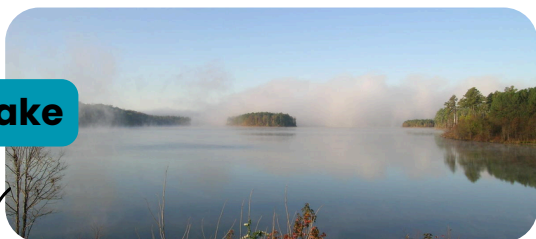




THE CITY OF RALEIGH

Tap in: Drinking Water Sources

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. In Raleigh's case, our source water comes Falls Lake, located in northern Wake County, and Lake Benson which is located in Garner, NC. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, can pick up contaminants resulting from the presence of animals or from human activity.

Falls Lake**Lake Benson**

To help reduce potential impacts of upstream contaminant sources, Raleigh Water established a Watershed Protection Program, which to date has helped permanently protected over 11,000 acres and 120 miles of streams in our drinking watersheds. More information about this program is available at this webpage:

<https://raleighnc.gov/water-and-sewer/services/watershed-protection-program>

Raleigh Water also partners with the Center for Applied Ecology at NC State University to provide real time water quality data at Falls Lake to help detect potential water quality issues. More information is available at this webpage:

<https://caae.cals.ncsu.edu/water-quality-data/>



THE CITY OF RALEIGH

Source Water Assessment

The North Carolina Department of Environmental Quality, Public Water Supply (PWS) Section, Source Water Assessment Program (SWAP) conducts assessments for all drinking water sources across North Carolina. The purpose of the assessments is 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 Raleigh Water 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:

SOURCE NAME	SUSCEPTIBILITY RATING
FALLS LAKE	HIGH
LAKE BENSON	HIGH

More information about the SWAP for our drinking water sources is available from the NC Department of Environmental Quality:

https://www.ncwater.org/SWAP_Reports/NC0392010_SWAP_Report-20200909.pdf



THE CITY OF RALEIGH

What Drives Our Safe Drinking Water

It's a promise of safe and clean drinking water for generations to come.



Raleigh Water laboratory staff logs roughly 38,083 miles per year collecting samples.



Laboratory staff handle and test 52,664 samples a year.

Laboratory staff from Raleigh Water's Treatment Plant Division perform an extensive level of testing to ensure the safety of your drinking water. Our drinking water laboratories are certified and approved by the State of North Carolina and the USEPA to perform drinking water quality analyses. In 2024, 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 per month for many substances such as trace metals, petroleum products, pesticides and bacteria. During 2024, the City of Raleigh was in full compliance with all state and national Drinking Water Regulations. The following data represents results for both the EM Johnson and Dempsey E. Benton water treatment plants.



THE CITY OF RALEIGH

DRINKING WATER TEST RESULTS:

EM Johnson Treatment Plant

CONTAMINANT (UNITS)	SAMPLE DATE	YOUR WATER	RANGE LOW HIGH	SECONDARY MCL
SODIUM (PPM)	Jan 2, 2024	20.4	N/A	N/A
SULFATE (PPM)	Jan 2, 2024	38.4	N/A	250
pH, SU	2024	8.41	8.39 - 8.50	6.5 - 8.5
ALKALINITY (PPM)	2024	23.8	20.1 - 29.2	N/A
HARDNESS (PPM)	2024	24.6	20.1 - 30.1	N/A

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.

CONTAMINANT (UNITS)	TREATMENT TECHNIQUE (TT) VIOLATION Y/N	YOUR WATER	TREATMENT TECHNIQUE (TT) VIOLATION IF:	LIKELY SOURCE OF CONTAMINATION
Turbidity (NTU) - Highest single turbidity measurement	N	0.11	Turbidity > 1 NTU	Soil runoff
Turbidity (NTU) - Lowest monthly percentage (%) of samples meeting turbidity limits	N	100%	<95% of monthly turbidity measurements are <0.3 NTU	Soil runoff



THE CITY OF RALEIGH

DRINKING WATER TEST RESULTS: CONTINUED

EM Johnson Treatment Plant**INORGANIC CONTAMINANTS**

CONTAMINANT (UNITS)	SAMPLE DATE	MCL VIOLATION Y/N	YOUR WATER	RANGE LOW HIGH	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
Simazine (ppb)	2024	N	0.1	ND - 0.10	4	4	Herbicide runoff

LEAD AND COPPER CONTAMINANTS

CONTAMINANT (UNITS)	SAMPLE DATE	YOUR WATER	# OF SITES FOUND ABOVE THE AL	RANGE LOW HIGH	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
Copper (ppm) (90th percentile)	2022	0.1	0	<0.01 - 0.123	1.3	AL = 1.3	Corrosion of household plumbing systems; erosion of natural deposits
Lead (ppb) (90th percentile)	2022	<3	0	< 3 - 5	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	MCLG	TREATMENT TECHNIQUE VIOLATION	LIKELY SOURCE OF CONTAMINATION
Total Organic Carbon (removal ratio) (TOC) - TREATED	N	1.45	1.31 - 1.70	N/A	Removal Ratio RAA <1.00 and alternative compliance criteria was not met.	Naturally present in the environment.

DISINFECTANT RESIDUALS SUMMARY

DISINFECTANT	YEAR SAMPLED	MRDL VIOLATION Y/N	YOUR WATER (HIGHEST RAA)	RANGE LOW HIGH	MRDLG	MRDL	LIKELY SOURCE OF CONTAMINATION
Chlorine (ppm)	2024	N	2.55	0.00 - 3.64	4	4	Water additive used to control microbes.
Chloramines (ppm)	2024	N	2.75	0.02 - 3.98	4	4	Water additive used to control microbes.



THE CITY OF RALEIGH

DRINKING WATER TEST RESULTS: CONTINUED

EM Johnson Treatment Plant**STAGE 2 DISINFECTION BYPRODUCT COMPLIANCE**

MONITORING	YEAR SAMPLED	MCL VIOLATION Y/N	YOUR WATER (HIGHEST LRAA)	RANGE LOW HIGH	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
TTHM (ppb)	2024	N	B12 - 36.0	7.60 - 36.3	NA	80	Byproduct of drinking water disinfection.
HAA5 (ppb)	2024	N	B11 - 29.7	4.72 - 25.7	NA	60	Byproduct of drinking water disinfection.

Understanding Your Drinking Water:

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, 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 stormwater 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, urban stormwater runoff, and residential uses; organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems; and 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 contaminants in bottled water, which must provide the same protection for public health.



THE CITY OF RALEIGH

DRINKING WATER TEST RESULTS:

Dempsey Benton Treatment Plant



Garner, NC



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.

CONTAMINANT (UNITS)	TREATMENT TECHNIQUE (TT) VIOLATION Y/N	YOUR WATER	TREATMENT TECHNIQUE (TT) VIOLATION IF:	LIKELY SOURCE OF CONTAMINATION
Turbidity (NTU) - Highest single turbidity measurement	N	0.09	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	Soil runoff

INORGANIC CONTAMINANTS

CONTAMINANT (UNITS)	SAMPLE DATE	MCL VIOLATION Y/N	YOUR WATER	RANGE LOW HIGH	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
Fluoride (ppm)	Jan 2, 2024	N	0.57	NA	4	4	Erosion of natural deposits, water additive which promotes strong teeth, or discharge from fertilizer and aluminum factories.



THE CITY OF RALEIGH

DRINKING WATER TEST RESULTS: CONTINUED

Dempsey Benton Treatment Plant

DISINFECTION BYPRODUCT PRECURSORS CONTAMINANTS

CONTAMINANT (UNITS)	TT VIOLATION Y/N	YOUR WATER (RAA REMOVAL RATIO)	RANGE MONTHLY REMOVAL RATIO	MCLG	TT	LIKELY SOURCE OF CONTAMINATION
Total Organic Carbon (removal ratio)	N	1.5	1.38 - 1.67	NA	Removal Ration RAA <1.00 and alternative compliance criteria was not met.	Naturally present in the environment.

SYNTHETIC ORGANIC CHEMICAL (SOC) CONTAMINANTS INCLUDING PESTICIDES AND HERBICIDES

CONTAMINANT (UNITS)	SAMPLE DATE	MCL VIOLATION Y/N	YOUR WATER	RANGE LOW HIGH	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
?	?	?	?	?	?	?	?

WATER CHARACTERISTICS CONTAMINANTS

CONTAMINANT (UNITS)	SAMPLE DATE	YOUR WATER	RANGE LOW HIGH	SECONDARY MCL
SODIUM (PPM)	Jan 2, 2024	23.4	NA	NA
SULFATE (PPM)	Jan 2, 2024	42.7	NA	250
pH, SU	2024	8.4	8.36 - 8.44	6.5 to 8.5
ALKALINITY (PPM)	2024	27.4	20.8 - 33.6	NA
HARDNESS (PPM)	2024	24.3	20.6 - 30.1	NA



THE CITY OF RALEIGH

Water Treatment Terminology

ACTION LEVEL (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

CHLORAMINATION: the process of adding ammonia to drinking water which already has chlorine added as a disinfectant. The ammonia combines with the existing chlorine which is called free chlorine to create chloramines.

CRYPTOSPORIDIUM: Cryptosporidium is a microorganism that can cause intestinal illness. Raleigh Water voluntarily tests for Cryptosporidium and DID NOT detect Cryptosporidium in its drinking water in 2021.

HALOACETIC ACIDS (HAAS): A group of chemicals known as disinfection byproducts. These form when a disinfectant reacts with naturally occurring organic and inorganic matter in the water.

MAXIMUM RESIDUAL DISINFECTION LEVEL GOAL (MRDLG): 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 (MRDL): The “Highest Level” (MRDL) of a disinfectant allowed in drinking water. There is clear evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MAXIMUM CONTAMINANT LEVEL (MCL): 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 (MCLG): 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.



THE CITY OF RALEIGH

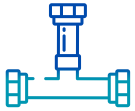


SOURCES OF LEAD IN DRINKING WATER



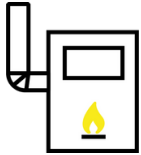
Faucets/Fixtures:

Old brass styles and fittings could contain lead.



Galvanized/Brass Pipes:

Galvanized piping connected to a lead service line may trap particles. Brass piping made before 2014.



Hot Water Heaters:

May trap lead particles over time.



Copper Pipe with Lead Solder: Solder made or installed before 1986 contained lead.

How Lead Gets Into Drinking Water

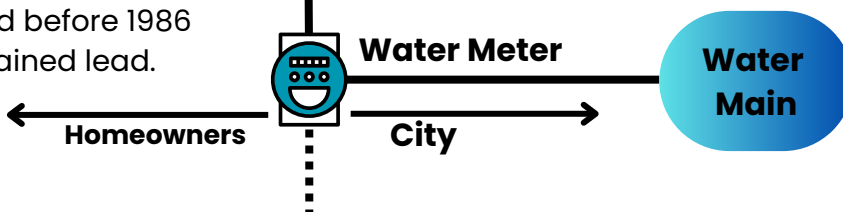
The Lead and Copper Rule (LCR) is the National Primary Drinking Water Regulation first promulgated in 1991 that requires actions by public water systems to reduce levels of lead and copper in drinking water. On January 15, 2021, the EPA promulgated the Lead and Copper Rule Revisions (LCRR), and the deadline for water systems to comply with these revised requirements is October 16, 2024. On December 6, 2023, EPA published the proposed Lead and Copper Rule Improvements (LCRI) that, when final, will significantly reduce exposure to lead through drinking water. The LCRI proposal builds on the LCRR and the original LCR.

The EPA plans to finalize the LCRI prior to the LCRR compliance date of October 16, 2024. More information about these changes can be found here:

<https://www.epa.gov/ground-water-and-drinking-water/revised-lead-and-copper-rule>

Lead Information Center Hotline: 800-424-LEAD [5323]

If you are concerned about lead in your water, you may wish to have your water tested. Raleigh Water customers may request a free kit to test for lead in their drinking water, by calling: 919-996-4H2O(4420) or by email: watersamples@raleighnc.gov





THE CITY OF RALEIGH

Your residence is connected to the public water distribution system through a small diameter pipe called a service line. In some older systems throughout the US these service lines contained a high level of lead and could represent a source of lead in drinking water. To date, Raleigh Water has never found a lead service line and given the age of our system we do not expect to find any. However, in exceedingly rare cases, the connection between the public system and a service line (called a “gooseneck”) can be made from lead. If a service line is galvanized iron, lead from a gooseneck could adhere to the inside of pipe and potentially be released into a residence. Therefore, to ensure compliance with LCRR, Raleigh Water has been using field verifications and machine learning tools to identify galvanized service lines and replace them.

Raleigh Water maintains an active program to minimize the risk of lead exposure through its drinking water supply. Operations staff carefully monitor and adjust pH levels of water to a specific range that reduces the corrosive nature of the water, and a corrosion inhibitor is added in our water treatment process to create and maintain a protective film in pipes that reduces the release of metals, such as lead, from household plumbing. The US EPA Lead and Copper Rule compliance is based on the 90th percentile of samples collected during each monitoring period from homes built in the target period between 1982 and 1985 or homes served by lead service lines. Our water distribution system is below the action level for lead and below the maximum contaminant level (MCL) for copper and is in full compliance with the Lead and Copper Rule.

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. Raleigh Water 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.

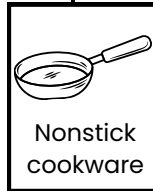


THE CITY OF RALEIGH

What are PFAS?



Per - and Polyfluorinated Substances or PFAS are synthetic chemicals that have been manufactured and used by a broad range of industries since the 1940s.



PFAS are used in many applications because of their unique physical properties such as resistance to high and low temperatures, resistance to degradation, and nonstick characteristics. They are commonly used in products like food packaging, dental floss, carpeting, waterproof clothing and cookware. PFAS have been detected worldwide in the air, soil, and water.

Due to their widespread use and persistence in the environment, most people in the United States have been exposed to PFAS. There is now evidence that continued exposure above specific levels to certain PFAS may cause adverse health effects. In response, the EPA established Maximum Contaminant Levels (MCLs) for six PFAS including perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorononanoic acid (PFNA), hexafluoropropylene oxide dimer acid (HFPO-DA, commonly known as GenX Chemicals), perfluorohexane sulfonic acid (PFHxS), and perfluorobutane sulfonic acid (PFBS). The MCLs for PFOA and PFOS at 4 parts per trillion (ppt), which is the level that can be reliably measured.



THE CITY OF RALEIGH

PFAS Continued.

The rule also places limits on any mixture containing one or more of PFNA, PFHxS, PFBS, and/or GenX Chemicals. For these PFAS, water systems use a hazard index calculation to determine if the combined levels of these PFAS pose a potential risk (calculation should be below “1.0”). Concentrations of these compounds in Raleigh’s drinking water have usually ranged from non-detectable to 4 ppt (PFOA) and non-detectable to 5.5 ppt (PFOS) and from non-detectable to 3.5 ppt (PFBS). The hazard index calculation for Raleigh's drinking water is 0.0017.

In response, Raleigh Water has adjusted our treatment processes in order to reliably meet the proposed regulations and we are evaluating additional treatment technologies which may be integrated into our facilities in the future.

More information is available on our webpage: <https://raleighnc.gov/water-and-sewer/perfluorinated-chemicals-data-and-information>

2024 PFAS Results

units: ng/L

Perfluorinated Compounds Contaminant	2/29/2024				5/9/2024				8/1/2024				11/7/2024			
	EMJWTP		DEBWTP		EMJWTP		DEBWTP		EMJWTP		DEBWTP		EMJWTP		DEBWTP	
	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw	Finished	Raw
Hexafluoropropylene oxide dimer acid (HFPO-DA) GenX	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluorooctanesulfonic acid (PFOS)	3.15	4.23	2.41	2.83	1.51	4.02	2.51	2.98	2.58	4.57	1.78	3.24	2.90	4.08	2.17	2.86
Perfluorooctanoic acid (PFOA)	2.75	2.99	2.69	2.75	2.17	2.57	2.53	2.86	2.76	2.90	2.94	3.35	2.57	2.69	2.38	2.76
Perfluorononanoic acid (PFNA)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Perfluorobutanesulfonic acid (PFBS)	2.19	2.17	2.45	2.50	2.62	2.63	2.73	2.78	3.05	3.02	3.14	2.94	2.33	2.37	2.56	2.67
Perfluorohexanesulfonic acid (PFHxS)	1.14	ND	1.40	1.52	ND	0.874	0.981	1.08	0.903	0.952	ND	ND	ND	ND	ND	ND



THE CITY OF RALEIGH

LET'S TALK ABOUT IT

Backflow Prevention Devices

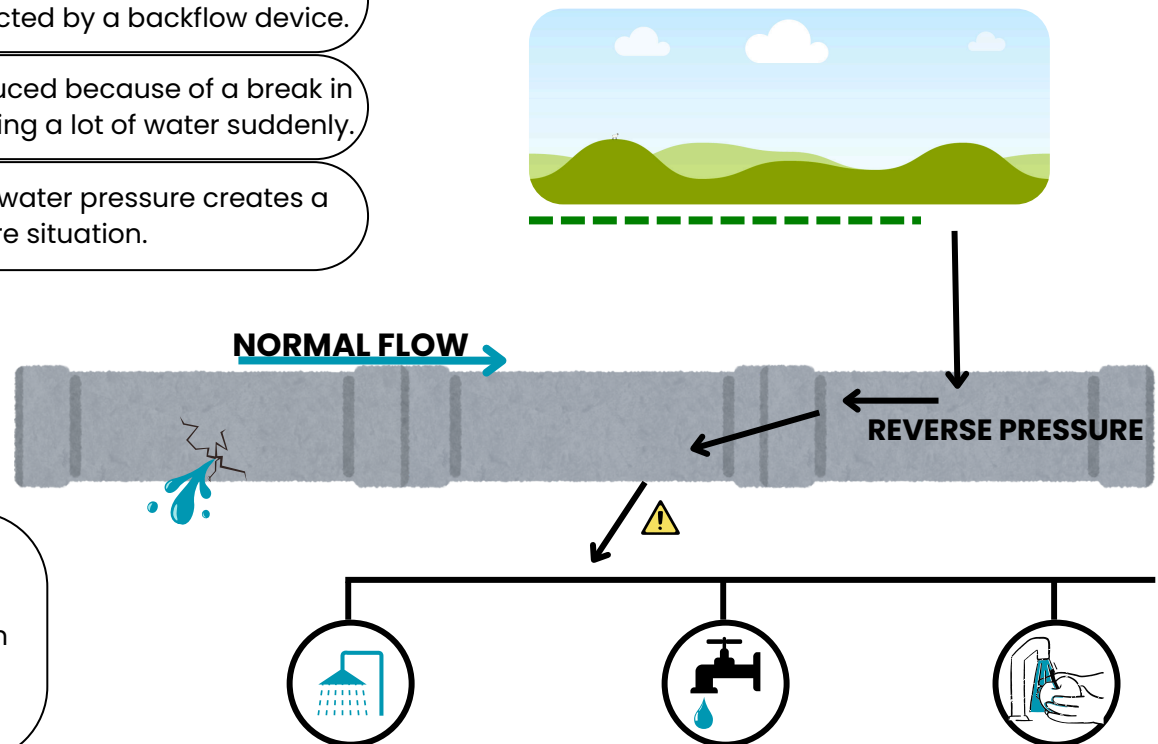
Backflow prevention devices protect the potable water supply by allowing water in only one direction to prevent potential backsiphonage of pollutants or contaminants from entering the public water supply. All commercial connections including domestic, fire and lawn irrigation are required to have a backflow device installed and tested annually. Every residential irrigation system is required to have a backflow assembly installed and tested every three years. If you have a backflow prevention device, please help us protect the public water system and make sure it is working properly.

Stage 1: Your home or business has a connection to public water system not protected by a backflow device.

Stage 2: Water pressure is reduced because of a break in the water main or fire event using a lot of water suddenly.

Stage 3: The sudden drop in water pressure creates a reverse pressure situation.

Stage 4: Dangerous contaminants from the unprotected connection can now potentially enter the drinking water supply.



If you would like to know more about backflow prevention, please call: (919) 996-2747
Or visit our backflow webpage: <https://raleighnc.gov/backflow-frequently-asked-questions>



THE CITY OF RALEIGH

Capital Infrastructure Projects for the Capital City

Raleigh Water is dedicated to providing safe and reliable water services to our customers:

- 24 Hours a day
- 7 Days a week
- 365 Days a year

This is why we also invest our capital funds into replacing, upgrading and repairing our critical water infrastructure.

To find out more about our Capital Projects, please visit our project page to see how we are improving our infrastructure for not only today, but for the future:

<https://raleighnc.gov/water-and-sewer/raleigh-water-capital-improvement-program>

Raleigh Water Service Areas

- ✓ Raleigh
- ✓ Garner
- ✓ Wake Forest
- ✓ Rolesville
- ✓ Knightdale
- ✓ Wendell
- ✓ Zebulon

Notice a Water Problem?

Please call Raleigh to report an unusual taste or odor with your tap water, a water main break or sanitary sewer backup or overflow. To report a main break or sewer backup/overflow, please call (919) 996-3245.

Thank you for your help!



**Raleigh
Water**



THE CITY OF RALEIGH