



WATER QUALITY REPORT

2023



KUB: 865-524-2911 (Español oprima el numero 2)
www.kub.org

As one of the largest public utility providers in the nation, Knoxville Utilities Board plays a critical role in our customers' lives. Throughout every facet of our operations, our employees work together to serve our community with high-quality utility services.

The dedication of our employees is exemplified at every stage of our water treatment process. From the moment water is collected from the Tennessee River until it leaves the customer's tap, KUB is there to ensure it is the highest quality.

Employees at our Water Quality Laboratory perform approximately 100,000 tests per year checking for more than 150 contaminants. Those at the plant and out in the field are working to test water at various points in our water treatment process. Underground construction crews and systems maintenance employees are continually working to keep our infrastructure reliable and up-to-date.

We are proud that every day we provide the community with high-quality, safe drinking water.

If you have questions, please call KUB at 865-524-2911.

Gabriel J. Bolas II, *KUB President & CEO*

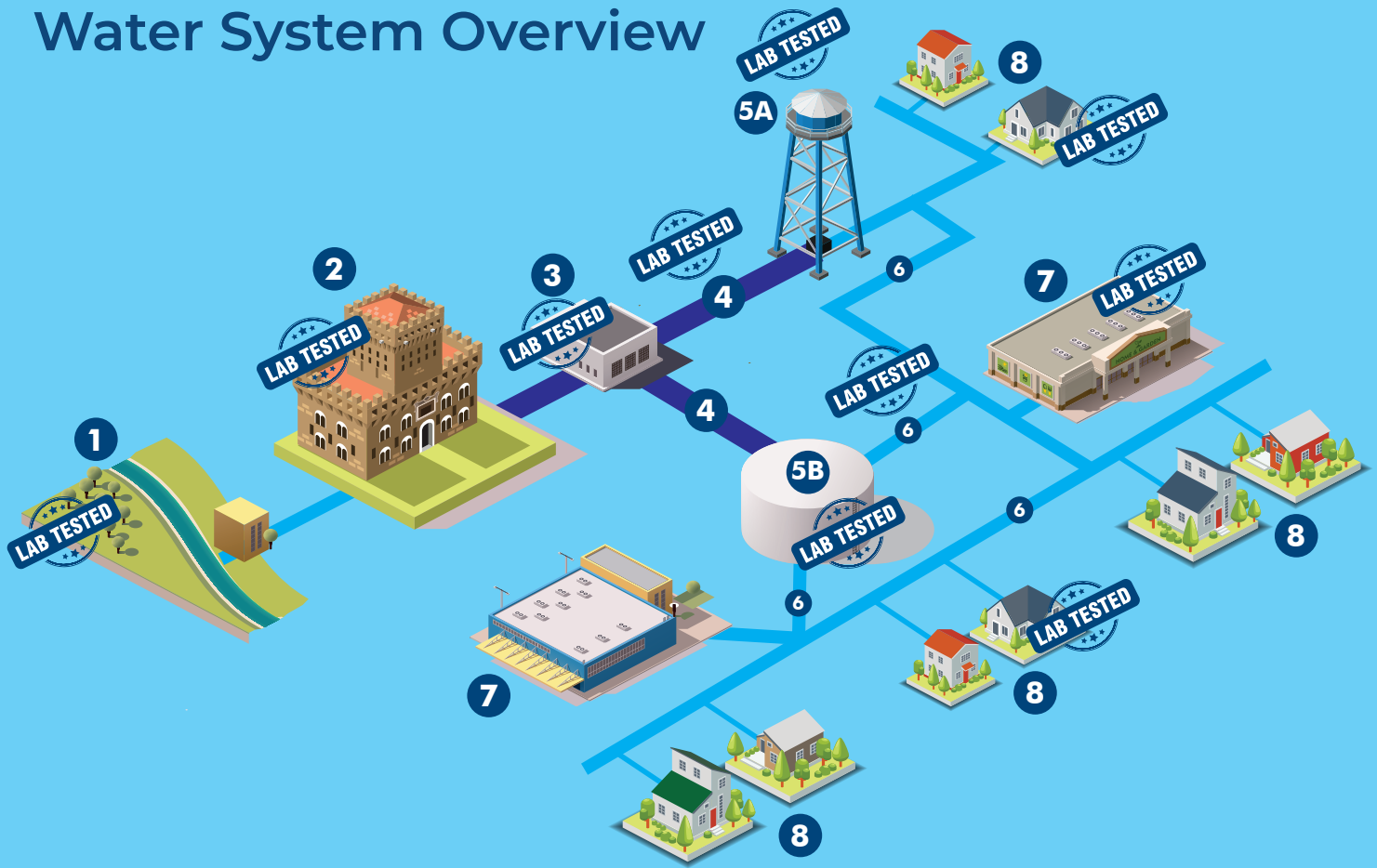


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Water System Overview



- 1** River Intake
- 2** Treatment Plant
- 3** Finished Water Pump Station
- 4** Transmission Mains
- 5** Storage Facilities
(A: Elevated Tank B: Ground Reservoir)
- 6** Distribution Mains
- 7** Commercial Service
- 8** Residential Service

Award-Winning Service

KUB is recognized as a Utility of the Future Today by the Water Environment Federation (WEF), the National Association of Clean Water Agencies (NACWA), the Water Research Foundation, the WateReuse Association, and the U.S. Water Alliance. Additionally, NACWA has recognized KUB with two National Environmental Achievement Awards.



Utility of the Future Today
Recognition from the Water Environment Federation (WEF), the National Association of Clean Water Agencies (NACWA), the Water Research Foundation, the WateReuse Association, and the U.S. Water Alliance



NACWA National Environmental Achievement Award in Workforce Development



NACWA National Environmental Achievement Award in Operations and Environmental Performance





Drinking Water Sources

Sources of drinking water (tap and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. KUB's source is surface water from the Tennessee River, which supplies the Mark B. Whitaker Water Plant.

As water travels over land or through the ground, it dissolves naturally occurring minerals and, sometimes, radioactive material. It can pick up substances resulting from human activity or the presence of animals.

Contaminants that may be 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 occur naturally 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 byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.
- Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

KUB's water source is rated reasonably susceptible to potential contamination. To ensure safe drinking water, all public water systems treat and routinely test their water under the guidance of the Source Water Assessment program. Summaries, susceptibility scorings and the full TDEC report to EPA can be viewed online at <https://www.tn.gov/environment/program-areas/wr-water-resources/water-quality/source-water-assessment.html>, or you may contact KUB for copies of specific assessments.

Protecting Our Source Water

Each of us could be adding to source water pollution without even knowing it. Even the smallest streams typically lead to the Tennessee River, so although it might seem too far away to matter, most streams (and storm drains) lead to our source. Reducing pollution at all levels and locations is important! Here are ways you can help protect our source water and the environment.

Recycle



In addition to household recycling, be sure to recycle:

- Unwanted automotive products
- Cleaning products
- Pesticides
- Lawn chemicals

Take waste to:

Household Hazardous Waste Facility, 1033 Elm Street

Please note: Latex paint is no longer accepted.

Medication Disposal



Never flush unused medicine down drains or toilets.

Take medication to:

- Collections sites
- Collection events
- Permanent drop box:

Knoxville Police Dept. Safety Building,

1650 Huron Street, Knoxville, TN 37917

Reducing PFAs



Poly- and Perfluoroalkyl Substances (PFAS) are man-made chemicals that are resistant to breaking down in the environment and may have adverse health effects. Although these compounds are not currently regulated, unregulated monitoring in 2024 has not indicated any detectable levels in KUB's drinking water. To learn more about the many sources of PFAS and how to reduce the risk of exposure, [please visit www.epa.gov/pfas](http://www.epa.gov/pfas) for more information.

Water Quality Summary

INORGANIC MONITORING				
Parameter	Range or Level Detected	MCLG	MCL	Likely Source in Drinking Water
Barium	25 ppb	N/A	2000 ppb	Discharge of drilling wastes and metal refineries; erosion of natural deposits
Nitrate	0.43 ppm	10 ppm	10 ppm	Runoff from fertilizer use; leaching from septic tanks; sewage; erosion of natural deposits
Fluoride	0.40 - 0.65 ppm (average 0.58 ppm)	4 ppm	4 ppm	Erosion of natural deposits; water additive, which promotes strong teeth; discharge from fertilizer and aluminum factories
Sodium	12 ppm	N/A	N/A	Used in treatment process

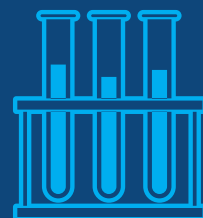
ORGANIC AND DISINFECTION BYPRODUCT MONITORING				
Parameter	Range or Level Detected	MCLG or MRDLG	MCL or MRDL	Likely Source in Drinking Water
Total Organic Carbon (Source) ¹	2.1 - 3.4 ppm (average 2.5 ppm)	N/A	TT	Naturally present in the environment
Total Organic Carbon (Tap) ¹	1.3 - 1.9 ppm (average 1.6 ppm)	N/A	TT	Naturally present in the environment
Total Trihalo-methanes (THM)	Maximum LRAA: 49 ppb ² Individual site range: 19 to 63 ppb	N/A	80 ppb	Byproduct of drinking water chlorination
Haloacetic Acids (HAA)	Maximum LRAA: 34 ppb ² Individual site range: 18 to 39 ppb	N/A	60 ppb	Byproduct of drinking water chlorination
Chlorine Dioxide	0.10 - 0.12 ppm (average 0.10 ppm)	MRDLG = 0.8 ppm	MRDL = 0.8 ppm	Water additive used to control microbes
Chlorine	Maximum Running Annual Average: 1.7 ppm 0.2 - 2.6 ppm	MRDLG = 4 ppm	MRDL = 4 ppm	Water additive used to control microbes
Chlorite	0.02 - 0.08 ppm (average 0.02 ppm)	0.8 ppm	1 ppm	Byproduct of drinking water disinfection

TURBIDITY MONITORING				
Parameter	Range or Level Detected	MCLG	MCL	Likely Source in Drinking Water
Turbidity ³	0.01 - 0.11 NTU	N/A	TT	Soil Runoff

LEAD AND COPPER MONITORING				
Parameter	90th Percentile Level	MCLG	MCL	Likely Source in Drinking Water
Copper	0.158 ppm	1.3 ppm	AL=1.3 ppm	Customer plumbing and service connection
Lead ⁴	1.0 ppb	0 ppb	AL=15 ppb	Customer plumbing and service connection

ADDITIONAL MONITORING ⁵	
Parameter	Average Level Detected
Alkalinity	77 ppm
Aluminum	26 ppb
Calcium	25 ppm
Chloride	18 ppm
Conductivity	243 µmhos/cm
Hardness	93 ppm
Iron	3 ppb
Orthophosphate	0.92 ppm
pH	7.4 Standard Units
Sulfate	14 ppm
Total Dissolved Solids	140 ppm
Zinc	83 ppb

State-of-the-Art Water Quality Laboratory
KUB is proud to serve our customers with one of the largest water quality labs certified by the State of Tennessee. The lab supports KUB's daily operations and allows us to quickly respond to customer concerns.



TERMS AND DEFINITIONS

Action Level (AL)	The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.
Maximum Contaminant Level (MCL)	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 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.
Maximum Residual Disinfectant Level (MRDL)	The highest level of a disinfectant allowed in drinking water. There is convincing evidence that adding a disinfectant is necessary for the control of microbial contaminants.
Maximum Residual Disinfectant Level Goal (MRDLG)	Below this level of a drinking water disinfectant, there is no known or expected risk to health. MRDLGs do not reflect the benefits of using disinfectants to control microbial contaminants.
Nephelometric Turbidity Unit (NTU)	A measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.
Treatment Technique (TT)	A required process intended to reduce the level of a contaminant in drinking water.

Note: To make the following common scientific measures of substances in water easier to understand, we have related them to examples.

Parts per million (ppm) or milligrams per liter (mg/l)	One part per million is equivalent to one minute in two years or a single penny in \$10,000.
Parts per billion (ppb) or micrograms per liter (ug/l)	One part per billion corresponds to one minute in 2,000 years or a single penny in \$10,000,000.

¹ KUB met the Treatment Technique requirement for Total Organic Carbon.

² Compliance is determined by calculating a quarterly Locational Running Annual Averages (LRAAs) at all the required sampling sites. The range includes the highest and lowest results obtained from monitoring sites across our distribution system in 2023.

³ No Turbidity violations were incurred during 2023. We met the treatment technique for turbidity with 100% of monthly samples below the turbidity limit of 0.3 NTU. Turbidity is a measure of the cloudiness of the water. KUB monitors turbidity because it is a good indicator of the effectiveness of our filtration system.

⁴ None of the households out of the 61 sampled contained concentrations that exceeded the lead action level in 2022. **Lead:** 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. KUB 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 two 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 EPA Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

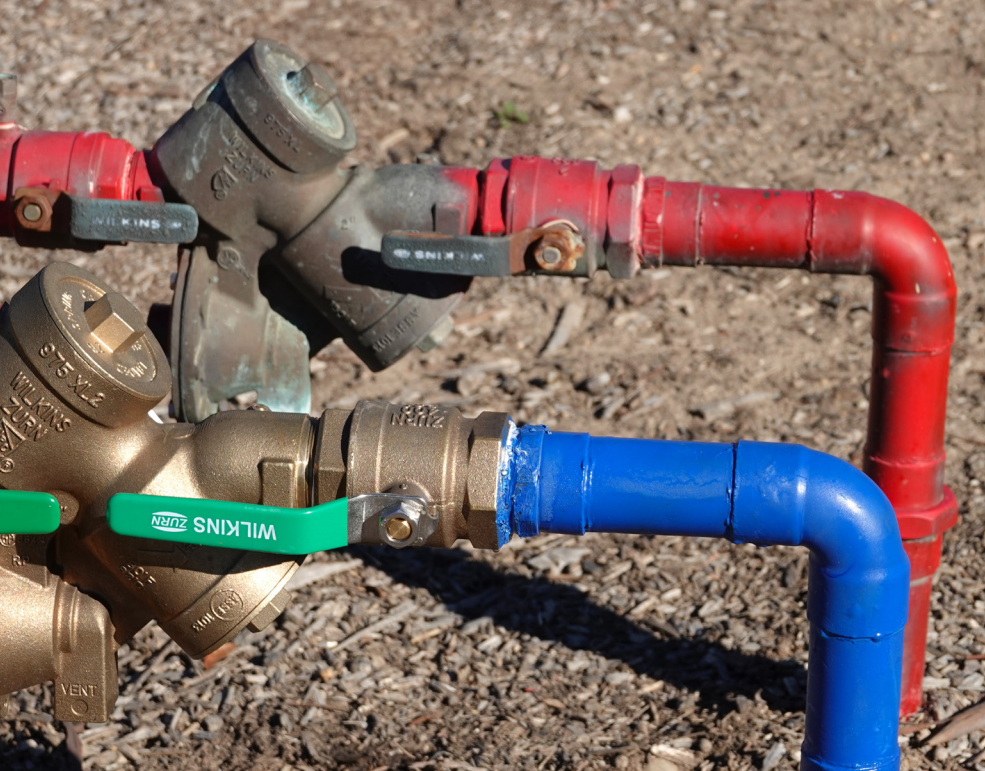
⁵ KUB's drinking water meets all existing standards for safe water. In addition to the required testing, KUB tests for over 80 additional parameters. Most of the substances tested for were not found in KUB's water. This table includes the results for additional parameters that were detectable.

PFAS and Lithium Monitoring



EPA periodically requires utilities to monitor for some specific unregulated contaminants that do not have 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.

In January 2024, KUB monitored for 30 chemical contaminants including 29 PFAS compounds as well as Lithium. None were detected. Additional monitoring will occur throughout 2024 and results will be made available in future water quality reports.

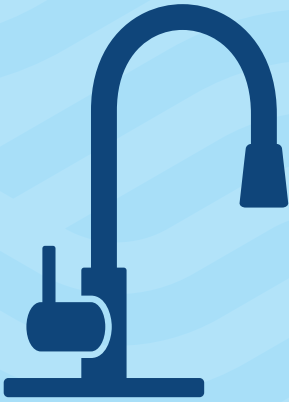


Protecting Our Drinking Water

State and federal regulations require KUB to operate a Cross-Connection Control Program (CCCP) to protect the community's drinking water from possible contamination. Anything customers attach to plumbing that may introduce contaminants is a potential cross-connection. If water pipes lose pressure, water from homes or businesses with cross-connections may contaminate the drinking water. To prevent that, all customers with potential cross-connections must install, test, and maintain backflow prevention devices. Customers may need a device if they use chemicals or processing equipment, have an alternative water source, or have irrigation systems or fire protection systems. Unprotected cross-connections can introduce public health risks. Therefore, KUB must ensure properties with risks have properly working backflow devices to ensure water quality and compliance. For more information, visit www.kub.org/crossconnection. If you have questions or think that you may have a cross-connection, please call KUB at 865-524-2911.

Backflow devices prevent contamination of drinking water.

Keeping the Lead Out



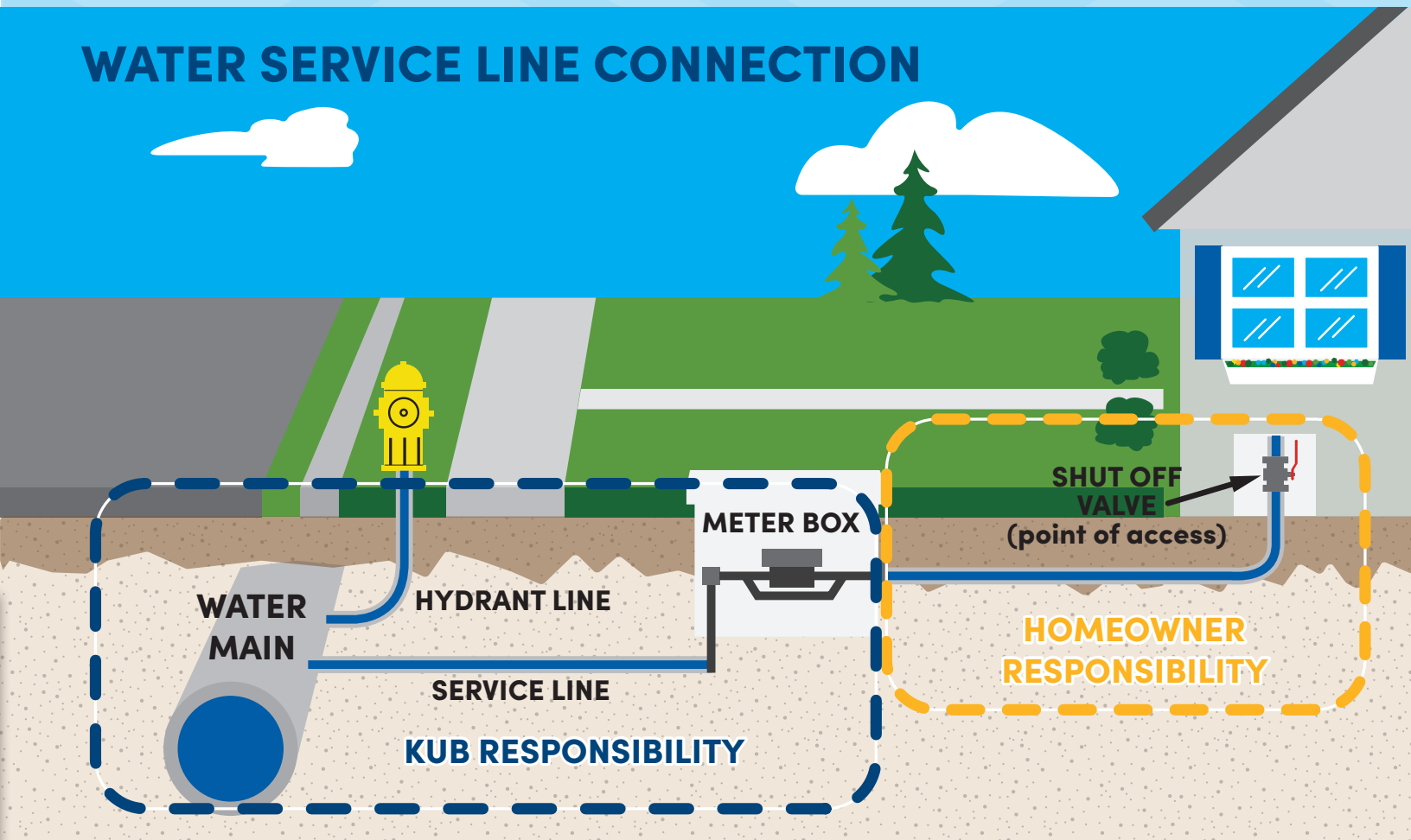
Did you know your home's plumbing may affect the quality of water coming from your tap? Concerns about lead in drinking water primarily come from the corrosion, or wearing away of materials in household plumbing that may contain traces of lead. To control corrosion and reduce the risk of lead from customers' plumbing, KUB continues to use a safe corrosion inhibitor that meets strict standards for use in drinking water. KUB also routinely monitors water quality to ensure effective corrosion control. Those efforts greatly reduce corrosion and ensure that KUB's water will continue to comply with all regulatory standards for lead.

KUB has an exceptional water quality record and takes the responsibility of providing safe and reliable water seriously. A recent EPA rule revision requires all public water providers like KUB to collect and maintain information regarding the materials used for water service lines, particularly in homes built prior to July of 1988.

In 2023, KUB began compiling an inventory of the pipe materials used in utility-owned and customer-owned water service lines, and to date, no lead service lines have been found. If you have questions or concerns about the composition of your service line, call 865-594-8377, email serviceinventory@kub.org, or visit www.kub.org/serviceinventory to watch a short video on how to identify your own pipe material.



WATER SERVICE LINE CONNECTION





Water Safety Regulations

To ensure tap water is safe to drink, EPA and the Tennessee Department of Environment and Conservation (TDEC) prescribe regulations that limit the amount of certain contaminants in water from public water systems. The U.S. Food and Drug Administration (FDA) establishes regulations and limits for contaminants in bottled water, which must provide the same level of protection for public health. 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.

For more information about contaminants and potential health effects, call EPA's Safe Drinking Water Hotline at 1-800-426-4791.



Information for Consumers at Risk

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised people, such as people with cancer undergoing chemotherapy, people 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/Centers for Disease Control and Prevention guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbiological contaminants are available from EPA's Safe Drinking Water Hotline, 1-800-426-4791.



Learn more:
www.kub.org/water



Contact Information

For more information about water contaminants and potential health effects, call the EPA Safe Drinking Water Hotline at 1-800-426-4791. If you have questions about KUB's water or this report, contact KUB at 865-524-2911 or visit our website at www.kub.org/water. KUB's Board meets monthly in open public session. Please feel free to participate in the meetings. Information on regularly scheduled meetings can be obtained on our website or by calling KUB.

Información en Español: Esta información es muy importante. Por favor tradúscalo o hable con alguien que lo entienda bien. Para más información en español, llame a KUB al número de teléfono 865-524-2911 y oprima el número 2.



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