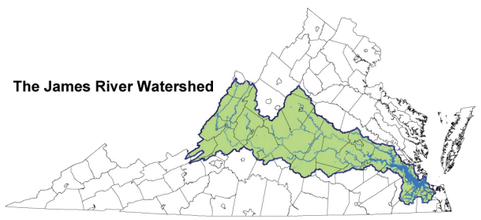
Definitions

• **AL** – Action Level: The concentration of a substance which, when exceeded, triggers treatment or other requirements.
• **RAA** – Running Annual Average: The average of analytical results of compliance samples taken during any consecutive four calendar quarters.
• **LRAA** – Locational Running Annual Average: The average of analytical results of compliance samples taken at each monitoring location during the previous four calendar quarters.
• **MCL** - Maximum Contaminant Level: The highest level allowed by regulation. MCLs are set as close to the MCLGs (see below) as feasible using the best treatment technology.
• **MCLG** - Maximum Contaminant Level Goal: The level of contaminant below which there is no known or suspected health risk.
• **MRDL** - Maximum Residual Disinfectant Level: The highest level of a disinfectant allowed in drinking water.
• **MRDLG** - Maximum Residual Disinfectant Level Goal: The level of a drinking water disinfectant below which there is no known or expected risk to health.
• **MREM** - Millirem. A unit of measure that estimates the damage radiation does to human tissue.
• **NA** – Not applicable.
• **ND** – Not detected.
• **NTU** – Nephelometric Turbidity Unit: A measure of turbidity, water cloudiness.
• **pCi/L** – Picocuries per liter: A measure of radioactivity.
• **ppb** – parts per billion or micrograms per liter (µg/L)
• **ppm** – parts per million or milligrams per liter (mg/L)
• **Removal ratio** – a ratio between the percentage of a substance actually removed to the percentage of the substance required to be removed.
• **SMCL** - Secondary Maximum Contaminant Level: These standards are developed to protect aesthetic qualities of drinking water and are not health based.
• **su** – standard units. Used in pH measurements.
• **TT** – Treatment Technique: Process intended to reduce the level of a substance in drinking water.
• **Source water** – Untreated water
• **Finished Water** – Treated water
• **Regulated Substances** - are regulated by the EPA and their concentration cannot be above the MCL.
• **Unregulated Substances** - are not regulated by the EPA, but they must be monitored so information about their presence in drinking water can be used to develop limits.

Our Water Source

The source of our water is the James River.



Water Quality Information

The State allows us to monitor for some substances less than once per year because the concentrations of these substances do not change frequently.

The Virginia Department of Health conducted a source water assessment of our system during 2002. The Richmond Water Treatment Plant was determined to be of high susceptibility to contamination, using criteria developed by the state in its EPA-approved Source Water Assessment Program. The assessment report consists of maps showing the source water assessment area, an inventory of known land use activities of concern, and documentation of any known contamination within the last five years from the date of assessment. This report is available by contacting the Department of Public Utilities at 646-8701.

The City of Richmond monitors the James River continuously throughout the year for various substances. We will continue to monitor our source water to enhance the water treatment process and to ensure the highest quality finished water is provided to our customers.

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.

The City of Richmond 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 or until it becomes cold or reaches a steady temperature before using water for cooking or drinking.

If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing materials, and steps you can take to minimize exposure is available from Safe Drinking Water Hotline at www.epa.gov/safewater/lead or by calling the Safe Drinking Water Hotline at 1-800-426-4791.

Substances Expected To Be In Drinking Water

As water travels over land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material. Water can pick up substances resulting from the presence of animals or human activity. Substances that may be present in source water include:
• Microbial substances such as viruses and bacteria, which may come from domestic animals, wildlife, septic systems, livestock and sewage treatment plants.
• Inorganic substances 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 chemicals, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can come from gas stations, urban stormwater runoff and septic systems.
• Radioactive substances, which can be naturally occurring or be the result of oil and gas production and mining activities.

Water treatment significantly reduces the level of these substances in drinking water. In order to ensure that tap water is safe to drink, Environmental Protection Agency (EPA) regulations limit the amount of certain substances in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for substances in bottled water, which must provide the same protection for public health.

Cryptosporidium

Cryptosporidium is a microbial parasite found in surface water throughout the United States. Sampling was not required in 2022 as our last sampling found an average of 5.4 Oocysts/100L. This is less than the Action Level of 7.5 Oocysts/100L.

City of Richmond Department of Public Utilities

Consumer Confidence Report

Richmond, VA's Drinking Water Quality 2022

Why We Report on Water Quality

The U.S. Environmental Protection Agency (EPA) 1996 Safe Drinking Water Act requires water utilities to provide consumers with a yearly report on the source and quality of the water they drink. You may also find this information posted on our website www.rva.gov/public-utilities/water-utility.

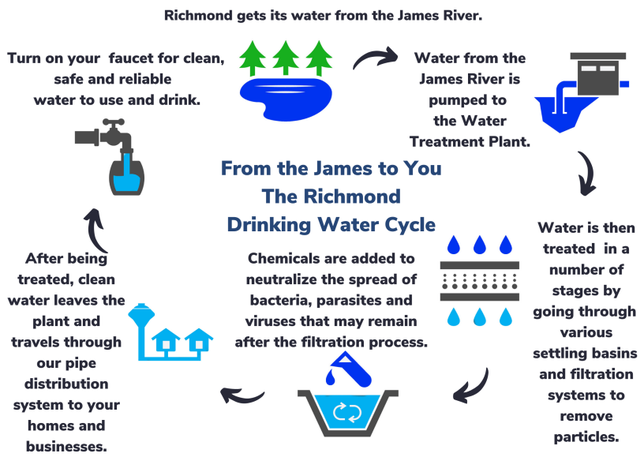
We are proud to report that during 2022 we were in 100 percent compliance with all federal and state Safe Drinking Water Act MCLs (Maximum Contaminant Levels). Last year the City of Richmond Department of Public Utilities (DPU) conducted 58,634 tests on more than 15,000 water samples. The table lists all the substances that were detected in our drinking water during 2022. The presence of these substances in water does not necessarily indicate that the water poses a health risk. Unless otherwise noted data presented in this table is from testing performed January 1 through December 31, 2022.

Richmond's Drinking Water: A History

Richmond's Water Treatment Plant was built on the banks of the James River in 1924. Before then, more than 300 years ago, Richmond's drinking water came from numerous springs and an open stream flowing from the Capitol across Main Street. Over the years the plant has been upgraded and enlarged to meet growing demand.

Today, DPU's water plant can produce up to 132 million gallons per day (MGD). In 2022, DPU treated on average 68.1 MGD of water and distributed it to 65,604 residential, commercial and industrial customers in the metro Richmond area. DPU also provides water to parts of Henrico, Chesterfield, Hanover, Goochland and Powhatan counties through wholesale contracts.

DPU has invested millions of dollars to ensure it always meets or exceeds federal regulations as well as the increasing regional demands for reliable, high-quality drinking water. Water utility employees perform numerous water tests every day and maintain more than 990 miles of water lines so when you turn on the tap, your family will receive water that is clean and safe.



Inside the Water Quality Report

This report is a snapshot of 2022 drinking water quality. Included is information about your water, what it contains and how it compares with standards mandated by the U.S. Environmental Protection Agency (EPA) and the Virginia Department of Health. This report is being made available to comply with the 1996 Safe Drinking Water Act. Landlords, businesses and other property owners are encouraged to share this water quality report with tenants. To save printing and mailing costs, the primary distribution of our annual report is online. For free copies or more information about this report, call the City of Richmond Department of Public Utilities (DPU)at 804-646-6405 and leave your name and mailing address or email dpuc@rva.gov for a link to the online copy. For information about public participation opportunities, visit our website at https://www.rva.gov/public-utilities/news.

Dedicated to Drinking Water Quality

The City of Richmond Department of Public Utilities is a member of the American Water Works Association, the American Water Works Association Research Foundation and the Association of Metropolitan Water Agencies. These organizations are dedicated to furthering knowledge and research on safe drinking water.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some substances. The presence of substances does not necessarily indicate that the water poses a health risk.

More information about substances and potential health effects may be obtained by calling the EPA's Safe Drinking Water Hotline at 1-800-426-4791.

Health Information

Some people may be more vulnerable to certain substances in drinking water than the general population. Immuno-compromised people - such as those with cancer who are undergoing chemotherapy, those who have undergone organ transplants, those with HIV/AIDS or other immune system disorders, and some elderly people and infants - can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC (Centers for Disease Control) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial substances are available from the Safe Drinking Water Hotline (1-800-426-4791).

For More Information

For more information about Richmond's water quality, call 804-646-8701 or visit us on the web at: https://www.rva.gov/public-utilities/water-utility
For general information about drinking water, visit the U.S. Environmental Protection Agency's website at www.epa.gov/safewater, or the Virginia Department of Health at www.vdh.virginia.gov.

DEPARTMENT OF
PUBLIC
UTILITIES

Microbial Contaminants

Substance	Likely Source	Richmond's Highest Monthly # of Positive Samples	Richmond's Highest Monthly % of Positive Samples	MCL	MGLG	Sample Date	Violation
Total Coliform (TC)	Naturally present in the environment	5	4.17%[1]	TT	N/A	Jul 2022	No
Escherichia Coli (EC)	Human and animal fecal waste	0	0%	An E. coli-positive repeat sample following a total coliform-positive routine sample OR A total coliform-positive repeat sample following an E. coli-positive routine sample OR Failure to collect all required repeat samples following an E. coli-positive routine sample OR Failure to test for E. coli when any repeat sample is total coliform-positive.	0	2022	No[2]

[1] If the highest monthly percentage of positive TC samples exceeds 5, Level 1 Assessment will be conducted to identify and correct sanitary defects. If the work incurs an EC MCL violation, Level 2 assessment will be conducted to identify and correct sanitary defects.

[2] If the waterworks incurs an EC MCL violation, Level 2 Assessment will be conducted to identify and correct sanitary defects.

The EPA has implemented the Stage 2 Disinfectants and Disinfection Byproduct Rule (Stage 2 DBPR) and the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). The Stage 2 DBP Rule provides increased protection against health effects associated with disinfection byproducts (DBPs). The LT2ESWTR further protects public health against Cryptosporidium and other microbial pathogens that may be present in drinking water.

Regulated Substances

Substance	Likely Source	Richmond's Results	Richmond's Range	MCL	MGLG	Sample Date	Violation
Fluoride (ppm)	Added to promote dental health	0.81	0.35 - 0.81	4	4	2022	No
Nitrate + Nitrite (ppm)	Fertilizer runoff, septic tank leakage, sewage, erosion of natural deposits	0.26			10	Jun-22	No
Total Organic Carbon Removal Ratio[3]	Naturally present in source water	1.0	0.6 to 2.0	TT removal ratio ≥ 1.0		2022	No
Alpha Emitters (pCi/L)	Erosion of natural deposits	<0.4		15	0	Aug-18	No
Beta Emitters (pCi/L)[4]	Erosion of natural deposits	2		4	0	Aug-18	No
Combined Radium (pCi/L)	Erosion of natural deposits	<0.5		5	0	Aug-18	No
TThms (ppb) Total Trihalomethanes[5]	Byproduct of drinking water disinfection	28	17 - 38	80		2022	No
HAA5 (ppb) Haloacetic Acids[5]	Byproduct of drinking water disinfection	23	2.4 - 30	60		2022	No
Barium (ppm)	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits	0.028 mg/L		2 mg/L		Jun-22	No

[3]TOC removal ratio - Richmond's result shows the lowest RAA. Richmond's range extends from the lowest to the highest of the compliance removal ratios measured monthly during the calendar year.

[4] The MCL for beta particles is 4mrem/year. EPA considers 50 pCi/1 to be the level of concern for beta particles.

[5]TTHM's and HAA5's – Richmond's result shows the highest LRAA. Richmond's range extends from the lowest to the highest of the compliance sample results measured quarterly during the calendar year.

Disinfectant

Substance	Likely Source	Richmond's Results	Richmond's Range	MRDL	MGLG	Sample Date	Violation
Chloramines (ppm)[6]	Disinfection	3.9	2.2 - 5.0	4	4	2022	No

[6]Chloramines – Richmond's result shows the highest RAA. Richmond's range extends from the lowest to the highest of the residual disinfectant levels measured monthly during the calendar year.

Turbidity

Substance	Likely Source	Richmond's Results	MCL	MGLG	Sample Date	Violation
Turbidity (NTU)	Soil Runoff	0.29, 100%[7]	TT 1.0 NTU, Max ≤0.3 (95% of the time)		2/5/2022	No

[7]Turbidity – Highest single measurement and the lowest monthly percentage of samples meeting monthly turbidity limits.

Lead and Copper

Substance	Likely Source	Richmond's Results (90th Percentile)[1]	Richmond's Range	MCL	MCLG	Sample Date	Violation
Copper (ppm)	Corrosion of household plumbing; leaching from wood preservatives	0.063	No results exceeded action level	Action Level = 1.3	1.3	2022	No
Lead (ppm)	Corrosion of household plumbing; erosion of natural deposits	3.7	No results exceeded action level	Action Level = 15	0	2022	No

[1]90th Percentile – The levels reported for lead and copper represent the 90th percentile of the total number of sites tested. The 90th percentile is equal to or greater than 90 percent of our lead and copper detections.

Unregulated Monitored Substances

Substance	Likely Source	Richmond's Results	MCL	Sample Date	Unit
Aluminum	Erosion of natural deposits; addition of water treatment substances	<0.05		2022	ppm
Manganese	Naturally present in the environment	<0.01		2022	ppm
Nickle	Corrosion of household plumbing	<0.01		2022	ppm
Sodium	Naturally present in the environment; addition of water treatment substances	12.6	*	2022	ppm
Sulfate	Naturally present in the environment; addition of water treatment substances	31.6		2022	ppm

*State and federal agencies recommend sodium levels in water not exceed 20 milligrams per liter (mg/L) for people on very low sodium diets and 270 mg/L for people on moderately restricted sodium diets.

Other Information

Substance	Richmond's Results	EPA's Suggested Limit	Sample Date	Unit
Alkalinity	43.4		2022	ppm
Chloride	12	250	2022	ppm
Hardness	65		2022	ppm
pH (acidity)	7.76	6.5 - 8.5	2022	su
Total Dissolved Solids	131	500	2022	ppm