

Consumer Confidence Report

Richmond, VA's Drinking Water Quality 2016

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 (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

Contact the City of Richmond Department of Public Utilities at 646-5224 for additional copies of this report. For more information about Richmond's water quality, call 646-5777 or visit us on the Web at: www.richmondgov.com/publicutilities/documents/reportwaterQuality2016.pdf

For more general information about drinking water, visit the U.S. Environmental Protection Agency's Web site at: www.epa.gov/safewater, 1-800-426-4791

Virginia Department of Health (Drinking Water) at: www.vdh.state.va.us

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, Richmond's Department of Public Utilities' (DPU) water plant can produce up to 132 million gallons per day (MGD). In 2016, DPU treated an average of 60.4 MGD of water and distributed it to more than 60,000 residential, commercial and industrial customers in the metro Richmond area. DPU also provides water to 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 1,200 miles of water lines so that when you turn on the tap, your family will receive water that is clean and safe.

Inside the Water Quality

This brochure is a snapshot of 2016 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 sent to you 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 will be online. For free copies or more information about this report, call the City of Richmond Department of Public Utilities (DPU): 646-5224.

For information about public participation opportunities, visit our website at www.richmondgov.com/PublicUtilities/index.aspx and our blog at www.richmondvaannouncements.blogspot.com for meeting announcements.

Why We Report on Water Quality

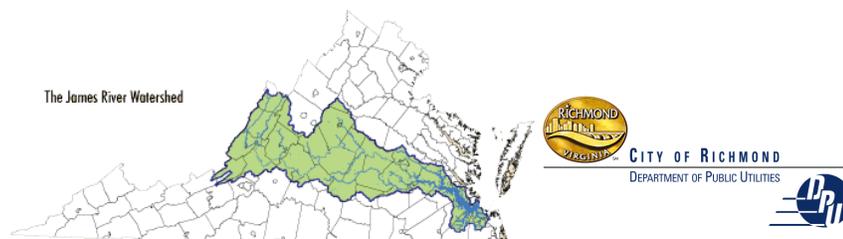
The U.S. Environmental Protection Agency (EPA) 1996 Safe Drinking Water Act requires water utilities to provide consumers with a yearly report on the **source and quality** of the water they drink. You may also find this information posted on our Internet website at www.richmondgov.com/PublicUtilities/documents/reportWaterQuality2016.pdf.

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 646-5777.

Our Water Source

The source of our water is the James River.



Microbial Contaminants

| Substance | Likely Source | Richmond's Samples Indicating Bacteria Presence | Richmond's Highest Monthly % of Positive Samples | MCL | MCLG | Sample Date | Meets EPA Standards |
|---------------------------------------|--------------------------------------|---|--|--|------|-------------|-------------------------------------|
| Total Coliform | Naturally present in the environment | 3 | 2.50% ¹ | 5% of all samples positive per month | 0 | May 2016 | <input checked="" type="checkbox"/> |
| Fecal coliform & Escherichia coliform | Human and animal fecal waste | 0 ² | 0% | A routine sample and repeat sample are total coliform positive; one is fecal or E. coli positive | 0 | 2016 | <input checked="" type="checkbox"/> |

¹Total Coliform – Highest monthly percentage of positive total coliform samples for 2016

² Fecal Coliform – Highest total number of positive samples per month in 2016

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 | MCLG | Sample Date | Meets EPA Standards |
|---|--|--------------------|------------------|-------------------------|------|-------------|-------------------------------------|
| Fluoride (ppm) | Added to promote dental health | 0.7 | 0.4-1.1 | 4 | 4 | 2016 | <input checked="" type="checkbox"/> |
| Nitrate + Nitrate (ppm) | Fertilizer runoff, septic tank leakage, sewage, erosion of natural deposits | 0.15 | | 10 | | April 2016 | <input checked="" type="checkbox"/> |
| Total organic carbon removal ratio ³ | Naturally present in source water | 1.5 | 1.2-2.5 | TT, removal ratio > 1.0 | | 2016 | <input checked="" type="checkbox"/> |
| Alpha Emitters (pCi/L) | Erosion of natural deposits | <0.7 | | 15 | 0 | Feb. 12 | <input checked="" type="checkbox"/> |
| Combined Radium (pCi/L) | Erosion of natural deposits | <0.6 | | 5 | 0 | Feb. 12 | <input checked="" type="checkbox"/> |
| TTHMs (ppb) Total trihalomethanes ⁵ | Byproduct of drinking water chlorination | 31 | 14-46 | 80 | | 2016 | <input checked="" type="checkbox"/> |
| HAA5 (ppb) Haloacetic Acids ⁵ | Byproduct of drinking water chlorination | 21 | 12-28 | 60 | | 2016 | <input checked="" type="checkbox"/> |
| Barium (ppm) | Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits | 0.028 mg/L | | 2 mg/L | | April 2016 | <input checked="" type="checkbox"/> |

³TOC Removal Ratio – Amount detected is the lowest of the annual rolling average of the four quarterly calculations made in 2016; range is the minimum and maximum of all samples used to calculate average

⁴ Radioactive Contaminants – Analyzed in 2012

⁵ TTHMs and HAA5s – Richmond's Results are the maximum of the rolling annual average. The range is the minimum and maximum of all 2016 samples used to calculate those averages.

Disinfectant

| Substance | Likely Source | Richmond's Results | Richmond's Range | MRDL | MRDLG | Sample Date | Meets EPA Standards |
|--------------------------------|---------------|--------------------|------------------|------|-------|-------------|-------------------------------------|
| Chloramines (ppm) ⁶ | Disinfection | 3.9 | 0.5-5.2 | 4 | 4 | 2016 | <input checked="" type="checkbox"/> |

⁶ Chloramines – Amount detected is the maximum of the annual rolling average; range is the minimum and maximum of all samples used to calculate average

Turbidity

| Substance | Likely Source | Richmond's Results | MCL | MCLG | Sample Date | Meets EPA Standards |
|-----------------|---------------|-------------------------|--|------|-------------|-------------------------------------|
| Turbidity (NTU) | Soil runoff | 0.21, 100% ⁷ | TT, 1.0 NTU, Max ≤ 0.3 (95% of the time) | | 10/14/2016 | <input checked="" type="checkbox"/> |

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

Lead and Copper

| Substance | Likely Source | Richmond's Results | Richmond's Range | MCL | MCLG | Sample Date | Meets EPA Standards |
|--------------|---|--------------------|----------------------------------|--------------------|------|-------------|-------------------------------------|
| Copper (ppm) | Corrosion of household plumbing; leaching from wood preservatives | 0.073 | No results exceeded action level | Action Level = 1.3 | 1.3 | 2016 | <input checked="" type="checkbox"/> |
| Lead (ppb) | Corrosion of household plumbing; erosion of natural deposits | 5 | 2/50 | Action Level = 15 | 0 | 2016 | <input checked="" type="checkbox"/> |

Unregulated Monitored Substances

| Substance | Likely Source | Richmond's Result | MCL | Sample Date | Unit |
|-----------|--|-------------------|-----|-------------|------|
| Aluminum | Erosion of natural deposits; addition of water treatment substances | <0.05 | | 2016 | ppm |
| Manganese | Naturally present in the environment | <0.01 | | 2016 | ppm |
| Nickel | Corrosion of household plumbing | <0.01 | | 2016 | ppm |
| Sodium | Naturally present in the environment; addition of water treatment substances | 13 | * | 2016 | ppm |
| Sulfate | Naturally present in the environment; addition of water treatment substances | 29.6 | | 2016 | ppm |

*For low or no salt diets, a limit of 20 ppm is suggested

Other Information

| Substance | Richmond's Result | EPA's Suggested Limit | Sample Date | Unit |
|------------------------|-------------------|-----------------------|-------------|------|
| Alkalinity | 44.7 | | 2016 | ppm |
| Chloride | 12.7 | 250 | 2016 | ppm |
| Hardness | 64 | | 2016 | ppm |
| pH (acidity) | 7.7 | 6.5 – 8.5 | 2016 | su |
| Total Dissolved Solids | 113 | 500 | 2016 | ppm |

Definitions

- **AL** – *Action Level*: The concentration of a substance which, when exceeded, triggers treatment or other requirements.
- **LRAA** – *Locational Running Annual Average*: The running annual average at each sampling location.
- **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.
- **NTU** – *Nephelometric Turbidity Unit*: A measure of turbidity, water cloudiness.
- **ND** – *Not detected*.
- **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)*
- **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.

Cryptosporidium

Cryptosporidium is a microbial parasite found in surface water throughout the United States. We collected 24 samples during 2016 and found an average of 6.1 Oocysts/100L. This is less than the Action Level of 7.5 Oocysts/100L..

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 15-30 seconds 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: <http://www.epa.gov/safewater/lead>. Homeowners interested in replacing the lead piping on their side can call 646-8500.

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.

Why is my water cloudy and smelly?

Two of the most common calls DPU Water Plant water quality technicians receive is cloudy water complaints and hot water that has a bad taste or smell.

Neither issue is one the city can correct. Cloudy water is caused by dissolved gases such as oxygen, nitrogen, argon, carbon dioxide, or hydrogen sulfide and the water looks cloudy only momentarily. The milky coloring is just air and the water clears when allowed to sit for a minute or two.

Water that has not been used for a period of time may have a taste and odor from sitting stagnant in the pipes. Run your tap for a few minutes when returning home if you've been away for more than 24 hours.

If the chlorine in water is unpleasant, place your drinking water in an uncovered glass container in the refrigerator overnight. This allows for the chlorine to dissipate at a faster pace. A container with a large opening works better. Another option is to boil tap water for five minutes, then allow it to cool.

At different times of the year, water that comes out of your faucet may have a cloudy or milky appearance. This is normal. This is because the water from your water heater contains all of the above mentioned substances and is under pressure. It starts clearing from the bottom to the top as the tiny air bubbles rise. You don't need to call the Department of Public Utilities unless the water doesn't clear on its own.

Bad tasting or smelly hot water usually means the customer has a hot water heater that needs to be drained. Most of the time, it's sediment in the tank. Hot water heaters should be flushed periodically to minimize tastes and odors. Follow all manufacturing recommendations outlined in your owner's manual for properly maintaining your hot water heater.

For electric hot water heaters, shut off the power from the circuit breaker. If you use gas, shut the valve providing the gas supply. Next, turn off the cold water supply to the tank. It will be a valve near the bottom of the water tank. The piping will feel cool.

Near the bottom of the water heater is a drain valve, a small faucet or a round dial attached to a hose. If it's a hose attachment, attach a garden hose tightly to it and put the other end of the hose out a window or in a sink or basement drain. If you have a faucet valve, you'll need to drain it into buckets. You'll need at least two, one to empty while the other is filling.

When the tank is empty, DO NOT turn the power or gas back on yet. Turn the water back on and fill up the water heater first. After it is full, then you can safely turn the power or gas back on. It will take awhile before the water gets hot again.

For more information, search YouTube for videos on how to drain hot water heaters.

