



Presented By
**Henrico County
Public Utilities**

ANNUAL WATER QUALITY REPORT

WATER TESTING
PERFORMED IN 2014

Our Mission Continues

We are proud to present once again our annual water quality report covering all testing performed between January 1 and December 31, 2014. Most notably, last year marked the 40th anniversary of the Safe Drinking Water Act (SDWA). This rule was created to protect public health by regulating the nation's drinking water supply. We celebrate this milestone as we continue to manage our water system with a mission to deliver the best quality drinking water. By striving to meet the requirements of SDWA, we are ensuring a future of healthy, clean drinking water for years to come.

Please let us know if you ever have any questions or concerns about your water.

Community Participation

Regular Meetings of the Henrico Board of Supervisors are typically held on the second and fourth Tuesdays of every month in the Board Room, Administration Building, Government Center, 4301 East Parham Road. The Board meeting schedule and agenda can be found at <http://www.co.henrico.va.us/supervisors/>.

Each Board agenda has a public comment period.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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 may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791 or <http://water.epa.gov/drink/hotline>.



Where Does My Water Come From?

Henrico County customers receive water from the county's and the City of Richmond's water treatment facilities. The source water for both facilities is surface water drawn from the James River. The county's water treatment facility began operations in April 2004 and currently produces up to 51 million gallons of drinking water daily. Henrico's facility was designed to meet the county's future drinking water needs and can produce up to 80 million gallons per day. The facility has multiple sources of electric power and emergency generators to enhance our ability to provide drinking water during local power outages.

Substances That Could Be in Water

To ensure that tap water is safe to drink, the U.S. EPA prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same 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 these contaminants does not necessarily indicate that the water poses a health risk.

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, in some cases, radioactive material, and substances resulting from the presence of animals or from human activity. Substances 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, or wildlife; Inorganic Contaminants, such as salts and metals, which can be naturally occurring or may 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 may also come from gas stations, urban stormwater runoff, and septic systems; Radioactive Contaminants, which can be naturally occurring or may be the result of oil and gas production and mining activities.

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

Lead in Home Plumbing

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. We are 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.

Tip Top Tap

The most common signs that your faucet or sink is affecting the quality of your drinking water are discolored water, sink or faucet stains, a buildup of particles, unusual odors or tastes, and a reduced flow of water. The solutions to these problems may be in your hands.

Kitchen Sink and Drain

Hand washing, soap scum buildup, and the handling of raw meats and vegetables can contaminate your sink. Clogged drains can lead to unclean sinks and backed up water in which bacteria (i.e., pink and black colored slime growth) can grow and contaminate the sink area and faucet, causing a rotten egg odor. Disinfect and clean the sink and drain area regularly. Also, flush regularly with hot water.

Faucets, Screens, and Aerators

Chemicals and bacteria can splash and accumulate on the faucet screen and aerator, which are located on the tip of faucets, and can collect particles like sediment and minerals resulting in a decreased flow from the faucet. Clean and disinfect the aerators or screens on a regular basis.

Check with your plumber if you find particles in the faucet screen as they could be pieces of plastic from the hot water heater dip tube. Faucet gaskets can break down and cause black, oily slime. If you find this slime, replace the faucet gasket with a higher-quality product. White scaling or hard deposits on faucets and shower heads may be caused by hard water or water with high levels of calcium carbonate. Clean these fixtures with vinegar or use water softening to reduce the calcium carbonate levels for the hot water system.

Water Filtration/Treatment Devices

A smell of rotten eggs can be a sign of bacteria on the filters or in the treatment system. The system can also become clogged over time so regular filter replacement is important. (Remember to replace your refrigerator filter!)

Water Treatment Process

The treatment process consists of a series of steps.

First, raw (untreated) water is pumped from the river to the treatment plant. After it enters the plant, a coagulant is added and the water then goes to a rapid mixing basin followed by a flocculation basin. These two steps cause particles to adhere to one another (called floc) making them heavy enough to settle to the bottom of the sedimentation basins, where the sediments are removed.

The water then undergoes intermediate ozonation, which is used for primary disinfection of settled water prior to filtration. Next, the water goes through deep-bed granular activated carbon (GAC) filters. The GAC filters are used for removing turbidity, taste and odors, and any bio-degradable organics and/or ozonation byproducts remaining in the water following ozonation. Chloramines and fluoride are added to the filtered water, chloramines as a secondary disinfectant and fluoride to promote strong teeth. We also add a corrosion inhibitor to keep us in compliance with federal regulations. Finally, the finished water is pumped into the distribution system which delivers the water to your home or business.



QUESTIONS?

If you have any questions about this report or your drinking water quality, please call our Water Quality Engineer, Henrico County, Department of Public Utilities, at (804) 727-8700. Also, you can view this report on our Web site at <http://henrico.us/pdfs/utility/CCReport14.pdf>.

Source Water Assessment

The Safe Drinking Water Act mandated that the Virginia Department of Health (VDH) perform source water assessments for all public water sources. The assessment reports consist 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 the assessment. The VDH assessed our system in 2002 and determined that the source water for our system, the James River, was highly susceptible to contamination. As a result, both Richmond's and Henrico's water treatment facilities have systems that remove harmful contaminants from source water to ensure that high quality drinking water is supplied to you. Information about the source water assessment is available from our Water Quality Engineer, Henrico County, Department of Public Utilities, at (804) 727-8700.

Unidirectional Flushing

Unidirectional flushing (UDF) is utilizing high velocity of released water to clean the interior of the drinking water pipes. This procedure is used to enhance the water quality by removing any collected sediment from the water pipes.

Year 4 of our 10-year program is ongoing. Our contractor, WachsWater, has completed flushing the eastern part of Henrico and has moved into the western part of the county.

Year 5 will begin in the fall and will continue into the summer of 2016. During year 5, our goal is to flush 150 miles in older sections of the near west end.

Each resident affected by the flushing program will receive notification in the form of a letter two weeks in advance and a door hanger 48 hours ahead of the flushing. You will also see signs in your neighborhood advertising the flushing. A list of streets affected by the flushing will be maintained on our Web site. If you have any questions, please call our Community Liaison at (804) 501-7540.



You may not be aware of it, but every time you pour fat, oil, or grease (FOG) down your sink (e.g., bacon grease), you are contributing to a costly problem in the sewer collection system. FOG coats the inner walls of the plumbing in your house as well as the walls of underground piping throughout the community. Over time, these greasy materials build up and form blockages in pipes, which can lead to wastewater backing up into parks, yards, streets, and storm drains. These backups allow FOG to contaminate local waters, including drinking water. Exposure to untreated wastewater is a public health hazard. FOG discharged into septic systems and drain fields can also cause malfunctions, resulting in more frequent tank pump-outs and other expenses.

Communities spend billions of dollars every year to unplug or replace grease-blocked pipes, repair pump stations, and clean up costly and illegal wastewater spills. Here are some tips that you and your family can follow to help maintain a well-run system now and in the future:

NEVER:

- Pour fats, oil, or grease down the house or storm drains.
- Dispose of food scraps by flushing them.
- Use the toilet as a waste basket.

ALWAYS:

- Scrape and collect fat, oil, and grease into a waste container such as an empty coffee can, and dispose of it with your garbage.
- Place food scraps in waste containers or garbage bags for disposal with solid wastes.
- Place a wastebasket in each bathroom for solid wastes like disposable diapers, creams and lotions, and personal hygiene products including nonbiodegradable wipes.

Testing for *Cryptosporidium*

Cryptosporidium is a microbial parasite found in surface water throughout the United States. We collected 24 samples between 2006 and 2008 and found an average level of 2.1 oocysts/100 L. We also purchased water from Richmond. They collected 48 samples between 2004 and 2005 and found an average of 2.9 oocysts/100 L. Both values are less than the Action Level of 7.5 oocysts/100 L.

What's a Cross-connection?

Cross-connections that contaminate drinking water distribution lines are a major concern. A cross-connection is formed at any point where a drinking water line connects to equipment (boilers), systems containing chemicals (air conditioning systems, fire sprinkler systems, irrigation systems) or water sources of questionable quality. Cross-connection contamination can occur when the pressure in the equipment or system is greater than the pressure inside the drinking water line (backpressure). Contamination can also occur when the pressure in the drinking water line drops due to fairly routine occurrences (main breaks, heavy water demand) causing contaminants to be sucked out from the equipment and into the drinking water line (backsiphonage).

Outside water taps and garden hoses tend to be the most common sources of cross-connection contamination at home. The garden hose creates a hazard when submerged in a swimming pool or when attached to a chemical sprayer for weed killing. Garden hoses that are left lying on the ground may be contaminated by fertilizers, cesspools or garden chemicals. Improperly installed valves in your toilet could also be a source of cross-connection contamination.

Community water supplies are continuously jeopardized by cross-connections unless appropriate valves, known as backflow prevention devices, are installed and maintained. We have surveyed industrial, commercial, and institutional facilities in the service area to make sure that potential cross-connections are identified and eliminated or protected by a backflow preventer. We also inspect and test backflow preventers to make sure that they provide maximum protection.

For more information, review the Cross-Connection Control Manual from the U.S. EPA's Web site at <http://water.epa.gov/infrastructure/drinkingwater/pws/crossconnectioncontrol/index.cfm>. You can also call the Safe Drinking Water Hotline at (800) 426-4791.

Sampling Results

During the past year we have taken hundreds of water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic or synthetic organic contaminants. The table below shows only those contaminants that were detected in the water. The state requires us to monitor for certain substances less than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

REGULATED SUBSTANCES							
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Barium (ppm)	2014	2	2	0.036	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chloramines ¹ (ppm)	2014	[4]	[4]	3.0	0.1–4.9	No	Water additive used to control microbes
Combined Radium (pCi/L)	2011	5	0	2.3	ND–2.3	No	Erosion of natural deposits
Fluoride (ppm)	7/2014	4	4	0.8	0.7–0.8	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Haloacetic Acids [HAA] ¹ (ppb)	2014	60	NA	23	<1–36	No	By-product of drinking water disinfection
Nitrate (ppm)	7/2014	10	10	0.10	<0.05–0.10	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes] ¹ (ppb)	2014	80	NA	32	0.5–37	No	By-product of drinking water disinfection
Total Coliform Bacteria ² (% positive samples)	5/2014	5% of monthly samples are positive	0	1.3 (2 positive samples)	NA	No	Naturally present in the environment
Total Organic Carbon ³ (ppm)	2014	TT	NA	1.3	-2.5–2.8	No	Naturally present in the environment
Turbidity ⁴ (NTU)	2014	TT≤1.0 NTU	NA	2.96	0.12–2.96	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2014	TT≥95% of	NA	100	NA	No	Soil runoff
Tap water samples were collected for lead and copper analyses from sample sites throughout the community							
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH%TILE)	SITES ABOVE AL/TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper ⁵ (ppm)	2012	1.3	1.3	0.1	0/64	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead ⁵ (ppb)	2012	15	0	1	0/64	No	Corrosion of household plumbing systems; Erosion of natural deposits
SECONDARY SUBSTANCES							
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	MCLG	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
pH (Units)	7/2014	6.5–8.5	NA	6.39	NA	No	Naturally occurring
OTHER SUBSTANCES							
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE			
Hardness (ppm)	7/2014	61	NA	Compounds of calcium and magnesium			

¹ Amount detected is the maximum of the rolling annual average. Range is the minimum and maximum of all 2014 samples used to calculate those averages.

² We sample for coliforms each month, and our highest monthly total occurred in May. The results listed are the highest number of positive samples during any given month (2) and what percentage of the total monthly samples this number represents (1.3%).

³ Amount detected is the lowest rolling annual average removal ratio. Range is the minimum and maximum of all samples used to calculate those averages. (A value of 1 or greater indicates that the water system complies with the TOC removal requirements.)

⁴ Turbidity is a measure of the cloudiness of the water. It is monitored because it is a good indicator of the effectiveness of the filtration system. The combined turbidity reading exceeded the 1.0 NTU limit on June 26. There was no violation because this reading did not appear to accurately represent the actual water quality. Both the before and after readings and the individual/component readings were consistently in the 0.1 NTU range. In this instance, the reason for the high level appears to have been caused by switching from the power grid to generators.

⁵ Ninetieth percentile of the latest round of sampling equals the value of lead or copper at the 90% level of ascending results.

Definitions

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

MCL (Maximum Contaminant Level): 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.

MCLG (Maximum Contaminant Level Goal): 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.

MRDL (Maximum Residual Disinfectant Level): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG (Maximum Residual Disinfectant Level Goal): The level 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.

NA: Not applicable

NTU (Nephelometric Turbidity Units): Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

pCi/L (picocuries per liter): A measure of radioactivity.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).

SMCL (Secondary Maximum Contaminant Level): SMCLs are established to regulate the aesthetics of drinking water like taste and odor.

TT (Treatment Technique): A required process intended to reduce the level of a contaminant in drinking water.