

City of Manassas
2013 Water Quality Report
PWS ID#: VA6685100

Introduction:

The City of Manassas is pleased to present you with the 2013 Water Quality Report. We continue to be dedicated to providing our customers with the highest quality drinking water for consumption and fire protection twenty-four hours every day of the year. We are proud to report that your drinking water meets or exceeds State and Federal drinking water standards that are administered by the Virginia Department of Health (VDH). This Annual Report on Water Quality is to inform you, the customer, about the quality of your drinking water. This edition covers water quality testing completed from January through December 2013. The City is committed to providing our customers with information about their water supply, because well-informed customers are our best allies in supporting improvements necessary to maintain the highest drinking water quality standards. For more information about this report, or for any other questions related to your drinking water, please call Tony H. Dawood, Deputy Director of Water and Sewer at (703) 257-8380.

Water Sources:

The City of Manassas is fortunate, because we have two reliable water supply sources for our customers. The primary source is the City of Manassas Water Treatment Plant, which draws water from Lake Manassas, an impoundment on Broad Run in Western Prince William County. The watershed for Lake Manassas covers approximately 74.5 square miles, with the reservoir covering over 790 acres, and holding approximately 5.3 billion gallons of water at full capacity. The second source of water, if needed during peak consumption periods or emergencies, is water supplied from the Prince William County Service Authority (PWCSA). The water supplied to us from PWCSA is treated at Fairfax Water's Northern Treatment Facility the James J. Corbalis Plant, which withdraws water from the Potomac River. To learn more about our watershed on the Internet, go to U.S. EPA's Search Your Watershed at www.epa.gov/surf.

Under provisions of the Safe Drinking Water Act, states are required to develop comprehensive Source Water Assessment Programs to identify the watersheds that supply public tap water, provide an inventory of contaminants present in the watershed, and assess susceptibility to contamination in the watershed. The Virginia Department of Health (VDH) conducted a Source Water Assessment of the Lake Manassas Reservoir in 2002, and found it to be of high susceptibility to contamination using the criteria developed by the state in its approved Source Water Assessment Program. The VDH assessment report consists of maps showing the source water assessment area, an inventory of known land use activities of concern in Prince William County, and documentation of any known contamination within the last five years. The report is available by contacting our water system representative at the phone number given at the beginning of this water quality report.

Water Quality and Treatment:

The City of Manassas Water Treatment Plant's state licensed operators use multiple processes to remove microbial, organic, inorganic and particulate contaminants from our source waters during water treatment. Water treatment is the process of making potable water for human consumption and consists of a series of processes. First, raw water from Lake Manassas enters the water treatment plant, where pre-filtration chemicals are added. These pre-filtration chemicals cause the particles contained in raw water to adhere to one another, making them heavy enough to settle out in the settling basins. After settling, water is filtered through layers of anthracite, gravel, and silicate sand. As smaller suspended particles are filtered out, clear water emerges. After filtration, the water is disinfected with sodium hypochlorite, which is the primary disinfectant, and is important to the treatment process because it helps to kill harmful bacteria, viruses, and other microbial contaminants. Sufficient disinfection is needed to deter the growth of these harmful bacteria while the water is flowing through the pipes and into your home. Following disinfection ammonia is added to stabilize the disinfectant residual, pH is adjusted, ortho-phosphate is added to prevent corrosion, and fluoride is added to prevent tooth decay. After the treatment process, the water is pumped to the water distribution system via underground piping to customers in the City of Manassas, Manassas Park and Prince William County.

Contaminants That Might Be in Drinking 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. The U.S. Food and Drug Administration (FDA) 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 can acquire 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 storm water 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 storm water 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 storm water 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.

Health Information:

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as individuals with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, and some elderly and infants, may be particularly at risk from infections. The U.S. EPA and Centers for Disease Control and Prevention (CDC) provide guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants, and are available from the Safe Drinking Water Hotline at 1 (800) 426-4791.

Lead in Drinking Water:

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 Manassas 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 to 30 seconds or until it becomes cold or reaches a steady temperature 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 at <http://www.epa.gov/safewater/lead>.

The City of Manassas has regularly been testing for lead in accordance with the EPA's Lead and Copper Rule which was established in 1991. The lead and copper results from our last testing completed in 2012 were well below the established action level. Since the waterworks has demonstrated optimal results, the City is now on a reduced monitoring schedule. The next round of lead and copper testing will be performed in 2015.

Cryptosporidium:

Cryptosporidium is a microbial parasite found in surface water throughout the U.S. Although filtration removes Cryptosporidium, the most commonly used filtration methods cannot guarantee 100% removal. Monitoring of source water and finished water indicates the presence of these organisms. Current test methods do not allow us to determine if the organisms are dead or if they are capable of causing disease. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Cryptosporidium must be ingested to cause disease. In addition, it may be spread through means other than drinking water. Most healthy individuals can overcome the disease within a few weeks. However, immunocompromised people are at greater risk of developing life-threatening illness. We encourage individuals with weak immune systems to consult their doctor regarding appropriate precautions to take to avoid infection.

The City of Manassas monitored Lake Manassas for compliance under the U.S. Environmental Protection Agency's (EPA) Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). The EPA has developed this rule to provide increased source water protection against microbial pathogens, such as Cryptosporidium. The City of Manassas completed a two-year monitoring period under LT2ESWTR in September 2008. The data collected during the 2008 period is summarized in the table below:

Source (before Treatment)	Average Cryptosporidium Concentration (oocysts/Liter)
Lake Manassas	0.016

Table 1: 2008 Cryptosporidium Results

Under the LT2ESWTR, the average Cryptosporidium concentration determines if additional treatment measures are needed. A Cryptosporidium concentration of 0.075 oocysts/Liter triggers additional water treatment measures. Our primary and secondary source waters Cryptosporidium concentrations are well below this threshold.

Unregulated Contamination Monitoring Rule:

Unregulated contaminants are those for which EPA has not established drinking water quality standards. Monitoring helps EPA to determine where certain contaminants occur and whether they need to be regulating those contaminants. Back in October of 2009 and ending in 2010, the City of Manassas monitored quarterly for unregulated contaminants under the Unregulated Contaminant Monitoring Rule 2 (UCMR2). All of the City's results for the UCMR2 contaminants during this period were undetected. You can find a list of all the contaminants that were tested for under the UCMR2 by visiting the EPA's website at <http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/>

As of April 2012 the Unregulated Contamination Monitoring Rule 3 (UCMR3) was passed by the EPA, which will require the City to begin sampling starting the beginning of 2014. For more information on this next round of sampling and what parameters will be tested, please visit the EPA's website at <http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/ucmr3/basicinformation.cfm>

Contamination from Cross-Connections:

Pressure changes in water systems can cause a condition called "backflow", where water is "backsiphoned" or forced backward under a condition called "back pressure". Improperly connected plumbing can result in "cross-connections," which may cause dangerous health hazards if drinkable water is connected with or open to sources not suitable for drinking. Your lawn irrigation system is an example of a location where plumbing may be improperly connected, and susceptible to these conditions. City of Manassas and Virginia Department of Health regulations require the water purveyor to take measures to prevent backflow and cross connection events, and to reduce the threats to water quality and health. Please visit the following link, <http://www.manassacity.org/utilities>, to learn more about this serious concern and how you can help. If you should have any questions about the City of Manassas Cross Connection and Backflow Program, please call 703-257-8397.

Participation:

You are invited to participate in our Utility Commission Meetings and voice your concerns about your drinking water. The Utility Commission meets on the second Thursday of each month, beginning at 5:30 P.M. in the large conference room at the City of Manassas Public Works Building, 8500 Public Works Drive, Manassas, Virginia 20110. If you desire to attend or have questions please contact the Utilities Department at (703) 257-8351.

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.** Although all of the substances listed here are under the Maximum Contaminant Level (MCL) stipulated by the U.S. EPA, we feel it is important that you know exactly what was detected and how much of the substance was present in the water. The state requires us to monitor for certain substances less than once per year due to concentrations of these substances that do not change frequently. In these cases, the most recent sample data is included, along with the year in which the sample was taken.

Emerging Water Quality Concerns:

Protecting the health of our customers is of great concern to the City of Manassas. As water quality concerns rise in the public, it is our responsibility to ensure that our customers have the most up-to-date information available concerning possible contaminants in the drinking water. Some concerns to the public that have arisen in the past year are perchlorate, hexavalent chromium (chromium-6), and fluoride.

Perchlorate

Perchlorate is a chemical that can be found naturally occurring in nature, but is also man-made through the production of rocket fuels, fireworks, flares, and explosive materials. When ingested, scientific research indicates that the chemical perchlorate may have harmful effects on the thyroid gland, disrupting its ability to produce crucial hormones. Currently, this chemical is not regulated in drinking water systems and is therefore not required as part of our annual water quality testing. As of February 2nd, 2011, USEPA Administrator Lisa Jackson announced that a national drinking water regulation would be developed for perchlorate. However, since 2009 the City of Manassas has been voluntarily monitoring for perchlorate and has been continuously receiving results less than the detectable limit.

To find out more on perchlorate please visit the EPA's website at:

<http://water.epa.gov/drink/contaminants/unregulated/perchlorate.cfm>

Hexavalent Chromium (Chromium-6)

Made famous by the movie *Erin Brockovich*, hexavalent chromium is thought to be a known carcinogen, and harmful to humans when ingested in significant dosages. Although not specifically regulated in drinking water samples by the USEPA, on January of 2011 the USEPA released guidance for enhanced monitoring on this contaminant, which recommended the testing of raw and finished water by public water systems.

Currently, the City of Manassas still only monitors for total chromium in its water, which includes the detection of any hexavalent chromium as part of its testing. As part of the primary drinking water standards, the maximum contaminant level (MCL) for total chromium is 0.1 mg/L. The City's annual water quality monitoring for total chromium levels have been significantly below the MCL, with readings at less than 0.001 mg/L. For more information about hexavalent chromium and its health effects please visit the EPA's website at:

<http://water.epa.gov/drink/contaminants/basicinformation/chromium.cfm>

Fluoride

Fluoride has been added to public drinking water supplies in the United States since 1945, when it was added to the drinking water supply in Grand Rapids, Michigan, as a way to combat tooth decay in children. Currently, more than 60% of public water systems use fluoridation, with recommended dosages ranging between 0.7mg/L – 1.2mg/L. However, in January of 2011 a paper was released by the Centers for Disease Control (CDC) about limiting the range of fluoride in public drinking water to strictly 0.7mg/L, which is considered the optimum level needed for the prevention of tooth decay by the National Cancer Institute. Fluoride dosages at higher than 0.7mg/L have been linked in recent years to increases in streaking and spotting, also known as molting, on children's teeth. As of 2011 when this report surfaced, the City began lowering its dosage of fluoride to meet these recommendations with levels ranging from 0.7mg/L – 0.8mg/L. For more information on fluoride and its possible health effects please visit the EPA's website at: <http://water.epa.gov/drink/contaminants/basicinformation/fluoride.cfm>

2013 SUMMARY OF WATER CHARACTERISTICS FOR CUSTOMERS UTILIZING CITY OF MANASSAS FINISHED WATER

Components	City of Manassas					
	MCLG ¹	MCL ²	Level Detected	Minimum	Maximum	Major Source in Drinking Water
Barium (ppm) ³	2	2	0.02	N/A ⁴	N/A	Discharge from drilling wastes; discharge from metal refineries; erosion from natural deposits
Beta/photon emitters (pCi/L) ⁵	0	50	2.0	N/A	N/A	Decay of natural and man-made deposits
Cadmium (ppm)	0.005	0.005	0.002	N/A	N/A	Corrosion of galvanized pipes; erosion of natural deposits; discharge from metals refineries; runoff from waste batteries and paints
Chlorine (ppm)	MRDLG ⁷ =4	MRDL ⁶ =4	2.7	0.3	3.5	Water additive used to control microbes
Fluoride (ppm)	4	4	0.64	0.64	0.84	Water additive which promotes strong teeth; erosion of natural deposits; discharge from fertilizer and aluminum factories
Nitrate-Nitrite (ppm)	10	10	0.26	N/A	N/A	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Chloroform (ppb) ⁸	NRL ⁹	NRL	32.4	13.8	47.8	By-product of drinking water disinfection
Bromodichloromethane (ppb)	NRL	NRL	6.2	3.0	7.5	By-product of drinking water disinfection

¹**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.

²**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.

³**ppm (parts per million):** One part substance per million parts water (or milligrams per liter).

⁴**N/A** = not applicable

⁵**pCi/L (picocuries per liter):** A measure of radioactivity. The MCL for the Beta particles is written as 4mrem/year. EPA considers 50 pCi/L to be the level of concern for Beta particles.

⁶**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.

⁷**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 contamination.

⁸**ppb (parts per billion):** One part substance per billion parts water (or micrograms per liter).

⁹**NRL:** No Regulatory limit

Lead and Copper Results	AL ¹⁰	MCLG	90th Percentile	Number of Sites Tested	Number of Sites above the Action Level	Action Level Exceedance (Yes/No)	Typical Source
Copper (ppm)	1.3	1.3	0.16	33	0	No	Corrosion of household plumbing systems; erosion of natural deposits.
Lead (ppb)	15	0	ND	33	0	No	Corrosion of household plumbing systems; erosion of natural deposits.

Lead and copper results are based on testing completed in 2012. Since the 2012 lead and copper results were well below the established action level, the City of Manassas is on a reduced monitoring schedule. The next round of lead and copper testing will be performed in 2015.

¹⁰**AL (Action Level):** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

TESTING OF CITY OF MANASSAS' FINISHED WATER

Total Organic Carbon	MCL	MCLG	Quarterly Running Annual Average ¹²	Minimum	Maximum	Violation? Yes/No	Major Source in Drinking Water
	TT ¹¹ (ratio)	N/A	1.33	1.14	1.50	No	Naturally present in the environment

Total Organic Carbon has no health effects. However, it provides a medium for the formation of disinfection byproducts. These byproducts include trihalomethanes and haloacetic acids.

Compliance with the treatment technique reduces the formation of these disinfection byproducts.

¹¹TT = (Treatment Technique): A required process intended to reduce the level of a contaminant in drinking water.

¹²Quarterly Running Annual Average (QRAA) of the monthly ratio of actual Total Organic Carbon removal versus required Total Organic Carbon removal between source and treated waters. QRAA is to be ≥ 1 to be in compliance.

Turbidity	MCL	MCLG	Average Annual Turbidity	Highest Single Measurement	Lowest Monthly % Samples Meeting Treatment Technique Turbidity Limit	Violation? Yes/No	Major Source in Drinking Water
	TT(NTU) ¹³	N/A	0.08	0.40	100%	No	Soil runoff

Turbidity levels are measured during the treatment process after the water has been filtered, but before disinfection. The turbidity level of filtered water shall be less than or equal to 0.3 NTU in at least 95% of the measurements taken each month, and shall at no time exceed 1 NTU.

¹³NTU = (Nephelometric Turbidity Units): Measurements of the clarity, or turbidity of water.

Disinfection and Disinfection By-Products Results	MCL	MCLG	Annual Average Level Detected	Minimum	Maximum	Violation? Yes/No	Major Source in Drinking Water
Haloacetic Acids (ppb)	60	60	25	17	39	No	By-product of drinking water disinfection.
Trihalomethanes (ppb)	80	80	38	17	56	No	By-product of drinking water disinfection.

Microbiological Results	MCLG	MCL	Result	Violation? Yes/No	Typical Source of Contamination
Total Coliform Bacteria	0	Positives samples not to exceed 5% of monthly total	highest % monthly positive = 4.2%	No	Naturally present in the environment.
Fecal Coliform Bacteria	0	A routine sample and a repeat sample are total Coliform positive, and one is also fecal positive.	0	No	Human and animal fecal wastes.