

City of Manassas Park Annual Water Quality Report 2007



Continuing Our Commitment

Once again we proudly present our annual water quality report. This edition covers all testing completed from January 1, 2007 to December 31, 2007. As in the past, we are committed to delivering the best quality drinking water. To that end, we remain vigilant in meeting the challenges of source water protection, water conservation, and community education while continuing to serve the needs of all of our water users.

For more information about this report, or for any questions relating to your drinking water, please contact Kathleen R. Gammell, Public Works Director, at (703) 393-8840.

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.

Este informe contiene información importante acerca de su agua Potable. Haga que alguien lo traduzca para usted, o hable con alguien que lo entienda.



Where Does My Water Come From

The city is divided into two zones: a high-pressure zone and a low-pressure zone. Hydraulic grade lines define these zones. The low-pressure zone serves all areas west of Route 28 and the high-pressure zone serves all areas east of Route 28. The low-pressure zone is supplied completely by the city's three groundwater wells: Well #4 has a depth of 1,000 feet, Well #6 has a depth of 950 feet, and Well #9 has a depth of 925 feet. Presently, groundwater supplied by these three wells does not require treatment.

The high-pressure zone is supplied by surface water that is treated by the City of Manassas to meet state and federal water regulations.

To learn more about our watershed on the internet, go to the U.S. EPA's Surf Your Watershed Web site at www.epa.gov/surf/.

Note: The designations of high-pressure and low-pressure zones are not indicative of actual water pressure.

Lead in Drinking Water

Lead is a naturally occurring element in our environment. Consequently, our water supply is expected to contain small, undetectable amounts of lead. Most of the lead in household water, however, usually comes from the plumbing in your own home, not from the local water supply. The EPA estimates that more than 40 million U.S. residents use water that can contain lead in excess of the EPA's action level of 15 ppb. Lead in drinking water is a concern because young children, infants and fetuses appear to be particularly vulnerable to lead poisoning. A dose that would have little effect on an adult can have a big effect on a small body. On average, it is estimated that lead in drinking water contributes between 10% and 20% of the total lead exposure in young children.

All kinds of water, however, may have high levels of lead. We maintain our drinking water supply at an optimum pH and mineral content level to help prevent corrosion in your home's pipes. To reduce lead levels in your drinking water you should flush your cold-water pipes by running the water until it becomes as cold as it will get (anywhere from 5 seconds to 2 minutes or longer) and use only water from the cold-water tap for drinking, cooking and for making baby formula. Hot water is likely to contain higher levels of lead. For more information, contact the National Lead Information Center at 800-LEAD-FYI and the Safe Drinking Water Hotline at 800-426-4791.

Cross-Connection Control

Cross-connections are unprotected connections between a potable water system and any source or system containing untreated water or a substance that may not be considered safe. Over the last several years, the American Waterworks Association has documented hundreds of incidents nationwide involving cross-connections that have resulted in backflow of contaminants into the potable water supply. Examples include illness caused by pesticides, antifreeze, metals, paint solvents and acid entering the supply. You may not think of your home as having hazards that might affect the municipal water supply; however, a common garden hose submerged in a pool or a carwash bucket creates a cross-connection. If a water main breaks or if a fire hydrant nearby is being used, water pressure drops and the potential exists for a suction event to occur. This means that water in your kiddie pool or carwash bucket could be drawn back into the water system. Once there, the contaminated water could spread quickly to thousands of people. This is a serious concern of all water utilities. We can treat water, but we need to continue to protect it once it leaves the treatment plant and flows through the distribution system. To prevent contaminants from being drawn into our potable water supply through an undesirable reversal of flow in our distribution system, the Manassas Park Cross-Connection Control Plan requires the installation of devices between the potable water supply and source of potential contamination. All homes and businesses should have backflow protection. For additional information, please refer to our website at www.cityofmanassaspark.us under the tab, "Codes and Ordinances," Chapter 7, Article III.

City of Manassas Park Department of Public Works

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Water Quality Data Table

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 concentration 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.

Disinfectants & Disinfection Byproducts

SUBSTANCE	Unit of Measure	Year Sampled	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE - HIGH	LOW	VIOLATION	TYPICAL SOURCE
Chlorine	ppm	2007	4	4	1.23	0.2 - 2		No	Water additive used to control microbes
Haloacetic Acids [HAA]	ppb	2007	60	60	52	6 - 47		No	By-product of drinking water disinfection
TTHMs [Total Trihalomethanes]	ppb	2007	80	80	48	22 - 93		Yes	By-product of drinking water chlorination.

Inorganic Contaminants

SUBSTANCE	Unit of Measure	Year Sampled	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE - HIGH	LOW	VIOLATION	TYPICAL SOURCE
Arsenic	ppb	2006	10	10	2	ND - 2		No	Erosion of natural deposits; runoff from orchards, runoff from glass & electronics production wastes
Barium	ppm	2007	2	2	0.03	0.017 - 0.045		No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Fluoride	ppm	2007	4	4	0.9	0.8 - 1.1		No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories.
Mercury	ppb	2007	2	2	0.4	ND - 0.4		No	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands
Nitrate	ppm	2007	10	10	1.28	ND - 1.28		No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Nitrite	ppm	2007	1	1	0.01	ND - 0.01		No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits

Microbiological Contaminants

SUBSTANCE	Unit of Measure	Year Sampled	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE - HIGH	LOW	VIOLATION	TYPICAL SOURCE
Total Coliform	Number of Positive Samples	2007	No more than 1 positive sample	0	4	N/A		Yes	Naturally present in the environment
Total Organic Carbon ⁽¹⁾	Ratio ⁽²⁾	2007	≥ 1	NA	1.4	0.7 - 1.6		No	Naturally present in the environment
Turbidity ⁽³⁾	TT = 1NTU	2007	≤ 1 ⁽³⁾	NA	0.37	0.07 - 0.37		No	Soil runoff
	TT	2007	TT = 0.3 95 % of the time	NA	TT ≤ 0.3 99.9996% of the time	N/A		No	Soil runoff

Radioactive Contaminants

SUBSTANCE	Unit of Measure	Year Sampled	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE - HIGH	LOW	VIOLATION	TYPICAL SOURCE
Alpha Emitters	pCi/L	2006	15	0	14.3	4.2 - 14.3		No	Erosion of natural deposits
Beta/Photon Emitters ⁽⁴⁾	pCi/L	2006	50	0	3.4	1.6 - 3.4		No	Decay of natural and man-made deposits.
Combined Radium	pCi/L	2006	5	0	1.0	0.1 - 1.6		No	Erosion of natural deposits
Uranium	ppb	2006	30	0	5.64	5.25 - 5.64		No	Erosion of Natural Deposits

Volatile Organic Contaminants

SUBSTANCE	Unit of Measure	Year Sampled	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE - HIGH	LOW	VIOLATION	TYPICAL SOURCE
2,4,5-TP [Silvex]	ppb	2007	50	50	0.7	ND - 1.4		No	Residue of banned herbicide
2,4-D	ppb	2007	70	70	0.75	ND - 1.5		No	Runoff from herbicide used on row crops
Tetrachloroethylene	ppb	2005	5	0	1.2	ND - 1.2		No	Discharge from factories and dry cleaners

Lead and Copper

SUBSTANCE	Unit of Measure	Year Sampled	Action Level	MCLG	AMOUNT DETECTED (90th percentile)	Sites Above Action Level	Violation	TYPICAL SOURCE
Copper ⁽⁵⁾	ppm	2007	1.3	1.3	0.1	0	No	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives
Lead ⁽⁵⁾	ppb	2007	15	0	3	0	No	Corrosion of household plumbing systems; Erosion of natural deposits

- 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.
- Ratio of actual Total Organic Carbon removal versus required Total Organic Carbon removal between source and treated waters.
- 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.
- The MCL for beta particles is 4 mrems/year. U.S. EPA considers 50 pCi/L to be the level of concern for beta particles.
- Lead and Copper - Tap water samples were collected from 30 sample sites throughout the community.

Table 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

ND (Not Detected): Indicates that the substance was not found by laboratory analysis.

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).

removal ratio: A ratio between the percentage of a substance actually removed to the percentage of the substance required to be removed.

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

Turbidity: A measure of the cloudiness of the water. It is monitored because it is a good indicator of the effectiveness of the filtration process.

Substances 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. 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 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 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 byproducts 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

Cryptosporidium

Cryptosporidium is controlled under the Environmental Protection Agency's (EPA) Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR). The EPA created this rule to provide for increased protection against microbial pathogens, such as Cryptosporidium, in public water systems that use surface water sources. 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.

As noted in the table below, our wholesale supplier's concentrations of Cryptosporidium in source water are well below this threshold. Cryptosporidium is a microbial pathogen found in surface water throughout the U.S. Although filtration removes Cryptosporidium, the most commonly used filtration methods cannot guarantee 100 percent removal. Our wholesale supplier's monitoring indicates the presence of these organisms in our source water and/or finished water in amounts below the trigger level. Current test methods do not allow us to deter-

mine if the organisms are dead or if they are capable of causing disease. Ingestion of Cryptosporidium may cause cryptosporidiosis, an abdominal infection. Symptoms of infection include nausea, diarrhea, and abdominal cramps. Most healthy individuals can overcome the disease within a few weeks. However, immuno-compromised people, infants and small children, and the elderly are at greater risk of developing life-threatening illness. We encourage immuno-compromised individuals to consult their doctor regarding appropriate precautions to take to avoid infection.

Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water.

Source (before treatment)	Average Cryptosporidium concentration (oocysts/Liter)
Potomac River	0.026
Lake Manassas	0.008
Occoquan Reservoir	0.021

Source Water Assessment

In August 2002, the Virginia Department of Health completed a source water assessment of the wells that serve the city on the west side of Route 28. Using the criteria developed by the state in its approved Source Water Assessment Program, the wells were determined to be of high susceptibility to contamination. Land-use activities within a 1,000-foot-fixed radius of the groundwater area are a concern due to the migration of contaminants. Based on the determination of source susceptibility, the Virginia Department of Health may set more stringent requirements and testing frequency for the City's well-water sources to ensure these sources meet quality requirements.

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. The report is available by contacting Kathleen R. Gammell at (703) 335-8840. The assessment for the City of Manassas is available by contacting Dominic Brancaccio at (703) 257-8382.

About Our Violation

Trihalomethane (TTHM)

During the first two quarters of 2007, the City was in violation of state regulations because drinking water in the City of Manassas Park's east side did not comply with the Primary Maximum Contaminant Level (PMCL) for total trihalomethanes. The PMCL for trihalomethane is 80 ppb and testing on the City's east side was 94 ppb and 81 ppb for the first and second quarters of 2007 respectively. Residents of the City received written notification in 2007 per federal and state requirements.

Trihalomethane is formed as a by-product of disinfection by chlorine when the chlorine reacts with natural organics in the water. The City's wholesale supplier indicates the levels of trihalomethane were most likely due to drought conditions which resulted in increased algae growth. The City acted quickly to replace our wholesale water source on the east side of the City where the exceedance occurred. As a result of the action taken, trihalomethane test results during the last two quarters of 2007 were 64 ppb and 53 ppb respectively. The replacement water source from Prince William County Service Authority was served to the City's east side residents for a period of 5 months until we were satisfied that our regular wholesale water supplier had corrected the process problem.

The City's wholesale water supplier continues to upgrade treatment processes at its water treatment plant to ensure no future exceedances. Some people who drink water containing total trihalomethanes in excess of the MCL over many years could experience liver, kidney, and/or central nervous system problems, and may have an increased risk of cancer. The standard for total trihalomethanes was set by the Environmental Protection Agency (EPA), which is based on worst-case circumstances and uses considerable built-in safety factors to protect children and those who consume much more water than two liters per day. "Health officials agree that your related health risk is very low."

Total Coliform

April 2007

During April of 2007 we did not complete all monitoring or testing for Total Coliform Bacteria or disinfectant residual measurements, and we cannot be sure of the quality of our drinking water during that month. Fifteen (15) routine samples for bacteriological analysis and disinfectant residual measurements were required, and only 2 of each were

analyzed. However, monthly samples taken during May were all negative for Total Coliform Bacteria.

The error occurred due to improper labeling of sample bottles. We immediately coordinated with the state certified lab to ensure that all samples are labeled per lab requirements and that delivery of samples is confirmed by signature from the receiving lab. Future violations will be reported as required by state regulations in order to increase consumers' awareness of conditions that exist in their public water system.

August 2007

During August 2007 one regular distribution system sample and three repeat samples showed the presence of total coliform bacteria, which are naturally present in the environment. The standard is that no more than one sample per month may have any total coliform present. The presence of coliforms are used as an early indicator that other potentially-harmful bacteria may be present.

Upon notice of the presence of coliform from the state certified lab, the City quickly shut down all three wells on the west side and worked with the Prince William County Service Authority to immediately supply chlorinated water to the City's west side. This provided a replacement water supply until the source of the coliform could be identified and also provided disinfection of the water pipelines. Increased sampling around the location of the positive sample quickly revealed the source of the coliform as the City's Well #6. The City made several attempts to disinfect the well without success and this well remains offline.

The other two wells that service the City's west side continue to produce water that meets the standards of the EPA and the Virginia Department of Environmental Quality. Prior to putting these two wells back on-line the water system on the City's west side, including water pipeline and water storage tanks, were thoroughly tested to ensure that no total coliform remained in the system.

This affected only the west side of the city (Mathis Drive side of Rt. 28), which is serviced by three wells. Residents of the City received written notification in 2007 per federal and state requirements with a statement from health officials that, "This is not an emergency. Total coliform bacteria are generally not harmful themselves."

Water Conservation Tips

Water conservation measures are an important first step in protecting our water supply. Such measures not only save the supply of our source water but can also save you money by reducing your water bill. Here are a few suggestions:

Conservation measures you can use inside your home include:

- Fix leaking faucets, pipes toilets, etc.
- Replace old fixtures; install water-saving devices in faucets, toilets, and appliances.
- Wash only full loads of laundry.
- Do not use the toilet for trash disposal.
- Take shorter showers

You can conserve outdoors as well:

- Water the lawn and garden in the early morning or evening.
- Use mulch around plants and shrubs.
- Repair leaks in faucets and hoses.

Information on other ways that you can help conserve water can be found at www.epa.gov/safewater/publicoutreach/index.htm.

