



2016 Annual Drinking Water Quality Report

METHUEN WATER DEPARTMENT

PWS ID #3181000

METHUEN
WATER
DEPARTMENT

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To Our Customers

Dear Customer,
We are pleased to present to you this year's Water Quality Report for the City of Methuen. The intent of this report is to inform you about your drinking water and provide you with all of the information available on Methuen's drinking water quality. We are happy to report that your drinking water meets all federal and state requirements set forth by the Safe Drinking Water Act. In order to ensure that tap water is safe to drink, US Environmental Protection Agency (US EPA) and Massachusetts Department of Environmental Protection (Mass DEP) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The United States Food and Drug Administration (FDA) and Massachusetts Department of Public Health regulations establish limits for contaminants in bottled water that must provide the same protection of public health. By continuing to comply with the strict regulations for public water systems, Methuen Water Department can be sure that your drinking water is safe. If you have any questions about the contents of this report, please contact us by any of the methods listed below. In our efforts to become more sustainable, this and all future water quality reports will be available on the city's website for review. A paper copy will be sent to anyone requesting one. If you would like a printed copy, or if you have any questions or comments regarding our report, please email jgiglio@ci.methuen.ma.us

Addressing Lead and Copper

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In light of the nationwide focus on lead in drinking water, we're proud to share with you what we know about the presence of lead and copper in our water system. The negative effects of lead consumption on the human body are well known and documented. If present, elevated levels of lead can cause serious health problems, especially among pregnant women and young children. Methuen's source waters are lead-free, as is the water which travels to your home through mostly iron and steel pipes. In Methuen, lead in drinking water is primarily from materials and components associated with interior plumbing. There are no known lead water services in Methuen. Lead usually comes from the lead solder used, prior to 1986, to connect copper pipes. The copper comes from the pipes themselves. We add chemicals to adjust the pH and a blended phosphate to the water at our treatment plant in order to ensure the materials do not leach into the water. The Methuen Water Department is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. Lead and copper are contaminants that have a very specific and unique set of rules for sampling and testing. Sampling for these metals must be done at homes in the city rather than in the distribution system. Samples have to be collected after the water goes unused for at least six hours to allow for maximum contact between the water and the lead and copper. 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 before using the water for drinking or cooking. Every three years, testing for these contaminants is done 30 private residences and two different



schools in Methuen. Our last round of testing, taken in 2015 showed Methuen well within the strict federal standards. You can find complete lead and copper sampling results on page 3 of this report, along with the comprehensive report of all testing we conduct on our raw source waters and our treated water. If you are concerned about lead in your water, you may wish to have it 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 (800) 426-4791 or online at <http://water.epa.gov/drink/info/lead/index.cfm>**.

Where Your Drinking Water Comes From

In this report you'll find information about the four barriers of protection in place to ensure the highest quality drinking water from our source to your tap:

First Barrier: Source Water protection and monitoring. Find out where our water comes from and what we do to guard against contamination before it is even treated. Here you will also find our Source Water Quality testing results.

Second Barrier: Treatment techniques. Learn about the importance of treatment and how our Treatment Plant operates.

Third Barrier: Cross-Connection Program and system improvements. Read about everything our expanded cross-connection inspection team does to prevent contamination from within the city and what we're doing to ensure safe and reliable drinking water for generations to come. Also view our Distribution Water Quality testing results.

Fourth Barrier: Conservation and responsible water use. Learn what we do to minimize water waste and helpful tips to optimize your water efficiency. You'll also find some potentially eye-opening information about drinking tap water versus bottled water.

The first barrier of protection for any water supply system is to have clean sources of water. The only water supply for Methuen's Water Treatment Plant is the surface water from the Merrimack River, which starts in the White Mountains of New Hampshire. The Merrimack River covers over 4,672 square miles between the States of New Hampshire and Massachusetts. Because of the large recharge area the Merrimack River has a very large capacity to supply water even during extended droughts. Over the last 30 years the river has undergone a tremendous change as far as water quality is concerned. Upstream wastewater plants installed in the late 1980's and elimination of hidden outfalls has contributed to the "B" classification of the river water. Our intake station is directly alongside the river. The treatment plant pumps on average 4.5million gallons per day (MGD), with our high average in the summer months of 6 MGD and approximately 1.7 billion gallons of drinking water per year. This dramatic increased stress on our water supply is mostly caused by non-essential water use such as lawn irrigation. Methuen retains 10.6 million gallons of water storage in the distribution system. This storage helps maintain consistent water pressure throughout the 200miles of underground pipes that deliver drinking water to homes and businesses.



The Treatment Process— Second Barrier

Protection of our watershed is important, but it is far from the only measure we take to ensure the highest quality drinking water possible. Treatment of the water reduces levels of contaminants to a safe range and can effectively eliminate some substances, but will not remove all traces of all possible contaminants. 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 and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. In order to ensure that tap water is safe to drink, the Mass DEP and the US EPA prescribe regulations which limit the amount of certain contaminants in water provided by public water systems.

The Water Treatment Plant is a conventional filtration plant, which includes **pre-disinfection, coagulation, flocculation, and sedimentation**. The treatment process consists of a series of physical and chemical steps designed to produce a safe and consistent quality product.

- **Pre-disinfection**—Chlorine dioxide is generated on-site. This chemical oxidizes, disinfects and breaks down organic matter making the water more efficiently filtered. Chlorine dioxide is an effective disinfectant for the parasites giardia and cryptosporidium.
- **Coagulation & Flocculation**—using alum to make tiny particles in the water stick together to form larger particles, which can become large enough to settle out during the next process.
- **Sedimentation**—where gravity causes the floc to settle to the bottom. Large particles settle more rapidly than small particles. The clarified water, with most of the particles removed, moves on to the filtration step where the finer particles are removed.
- **Filtration**—This removes particles from the water using carbon filters.
- **pH Adjustment**—sodium hydroxide is added to make the water less acidic and less corrosive.
- **Disinfection**—sodium hypochlorite is added to kill bacteria and other microorganisms.
- **Corrosion Control**—A blended phosphate corrosion inhibitor is added to make the water less corrosive.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the US EPA's Safe Drinking Water Hotline 1-800-426-4791 or your local water supplier. We have confidence in the quality of our drinking water and you can too. The treatment plant monitors the water system at all times. In addition to watching water flows and pressure, our state-of-the-art Supervisory Control and Data Acquisition (SCADA) system monitors several water quality parameters and security alarms. If the system identifies anything out of the ordinary, alarms alert the certified operator on duty.

2016 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.

2016 Water Quality Data from the Methuen Water Department and Distribution System

Parameter (UNIT S)	Date	MCLG	MCL	Amount Detected	Range Low-High	Violation (Y/N)	Typical Source
REGULATED SUBSTANCES							
Perchlorate	2016	N/A	2	0.25	0.00-0.25	N	Inorganic chemicals used as oxidizers in solid propellants for rockets, missiles, fireworks, and explosives
Total Organic Carbon (% removal)	2016	N/A	TT=35-45% removal	2.17	<0.500-2.17	N	Naturally present in the environment
Total Coliform	2016	0	>5%	1.7% (month of Feb 2016)	----	N	Naturally present in the environment
Chlorine (ppm)	2016	4	4	1.34	0.01-1.34	N	Water additive used to control microbes
Total Trihalomethanes [TTHMs] (ppb)	2016	N/A	80	26.1	6.6-49.0	N	Byproduct of drinking water disinfection
Haloacetic acids [HAA] (ppb)	2016	N/A	60	12.2	4.1-12.0	N	Byproduct of drinking water disinfection
Turbidity	TT	Lowest Monthly % of Samples		Highest Daily Value		Violation (Y/N)	Typical Source
Daily Compliance (NTU)	5	----		0.185		N	Soil runoff
Monthly Compliance	At least 95%	100%		----		N	
Parameter (UNITS)	Year	AL	MCLG	Amount Detected (90th %tile)	Sites Above AL/ Total Sites	Violation	Typical Source
Copper (ppm)	2015	1.3	1.3	0.04	0/30	N	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppm)	2015	0.015	0	0.000	0/30	N	Corrosion of household plumbing systems; Erosion of natural deposits
<i>The city is only required to test for lead and copper every three years due to the non-existent and extremely low levels found at our taps. Tap water samples were collected for lead and copper analysis throughout the community. Samples are scheduled to be collected the summer of 2018.</i>							
UNREGULATED or SECONDARY CONTAMINANTS (MCL has not yet been established)							
Parameter (UNITS)	Date	Result or range	SMCL		ORSG or Health Advisory	Typical Source	
Odor(T.O.N)	2016	<1.0	3 TON		N/A	Erosion from natural deposits	
pH	2016	7.5	6.5—8.5		N/A	N/A	
Sodium(ppm)	2016	27	20		N/A	Naturally present in the environment and road salt	
Sulfate(ppm)	2016		250		N/A	Naturally present in the environment	
Total Dissolved Solids [TDS] (ppm)	2016	110	500		N/A	Erosion of natural deposits	

2016 Water Quality Data from the Methuen Water Department and Distribution System (continued)

Parameter (Units)	Average	Range of Detection	Possible Source
Unregulated Contaminant Monitoring Results (UCMR3)			
Chlorate (ppb)	253	160-380	By-product of drinking water disinfection
Chromium (ppb)	0.15	<0.03—0.14	Erosion of natural deposits
Strontium (ppb)	48	30-59	Erosion of natural deposits
Vanadium (ppb)	0.3	<0.2—0.5	Erosion of natural deposits
1,4-Dioxane (ppb)	0.11	0.11	industrial uses and accidental spills

What is Unregulated Contaminant Monitoring

Unregulated contaminants are those that do not have a drinking water standard set by the United States Protection Agency (US EPA). The UCMR3 results listed in the table above are those contaminants which were found to be greater than the analytical laboratory detection limit. Every five years, public water suppliers are required per the provisions of the Safe Drinking Water Act (SDWA) to monitor for up to 30 contaminants. This is referred to as the “UCMR” monitoring program. The results provide US EPA with valid data on the occurrence of contaminants in drinking water and help determine whether or not standards should be set. During 2014 and 2015, the Methuen Water Treatment Plant monitored for 21 contaminants at the entry point to the distribution system. The list of contaminants to be monitored by the Methuen Water Treatment Plant was established by US EPA, and included metals, organic compounds and perfluorinated compounds. For additional information, please visit <http://www.epa.gov/dwucmr/third-unregulated-contaminant-monitoring-rule>

Water Quality Definitions

- **90th Percentile:** Out of every 10 homes sampled, 9 were at or below this level.
- **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 available.
- **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.
- **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).
- **TT (Treatment Technique):** A required process intended to reduce the level of a contaminant in drinking water.



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>**.

Substances that Could Be in Our Source Water

To ensure that tap water is safe to drink, the Department of Environmental Protection (DEP) and the U.S. Environmental Protection Agency (U.S. EPA) prescribe regulations limiting the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) and Massachusetts Department of Public Health (DPH) 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 and, in some cases, radioactive material, and can pick up 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 which 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.

More information about contaminants and potential health effects can be obtained by calling the **U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.**



A little more about LEAD

Lead enters the water ("leaches") through contact with the plumbing. Lead leaches into water through:

Corrosion of:

- Pipes
- Solder
- Fixtures and Faucets (brass)
- Fittings

The amount of lead in your water also depends on the types and amounts of minerals in the water, how long the water stays in the pipes, the amount of wear in the pipes, the water's acidity and its temperature.

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.

A letter from your Distribution Superintendent

The City of Methuen Water Distribution Division has 13 full time employees with specialty equipment and tools to maintain over 200 miles of the water distribution piping along with over 18,000 water services, three storage tanks and four water pumping stations. The division has responded to over 3,000 scheduled appointments and emergency customer concerns in 2016.

We continue to meet and/or exceed all state mandated water distribution operations and maintenance requirements. We document and analyze all repairs, calculate system water loss and conduct system wide leak detection. We completed a State Department Environmental Protection Sanitary Inspection survey this year and filed all annual D.E.P. reports with no violations.

We upgraded over 46 leaking water services and repaired 23 ruptured water mains ranging in size from 4 inch to 12 inch pipes and installed 31 new 6", 8" and 12" isolation valves in our distribution system. We have assisted in replacing 1,200 feet of water piping, 23 water services and replaced 5 fire hydrants at the Massachusetts Department of Transportation Route 110/113 Rotary Project.

We completed the annual inspection of all 1,800 City owned fire hydrants in our distribution system. We repaired and upgraded 97 fire hydrants, replaced 54 fire hydrants, and added 3 new fire hydrants to the system.

The accomplishments above are in conjunction with the everyday general maintenance of the water distribution system. Including quarterly reading of all 17,500 water & sewer system meters, unilateral valve isolation water quality flushing, maintaining all water buildings, acres of landscaped grounds, including the four water stations which are security inspected daily, with the three storage holding tanks with over 10 million gallons of potable water for consumption and fire demand if needed for Methuen residents.



Daryl Laurenza
Water Distribution

Cross Connections and Backflows

What is a cross connection?

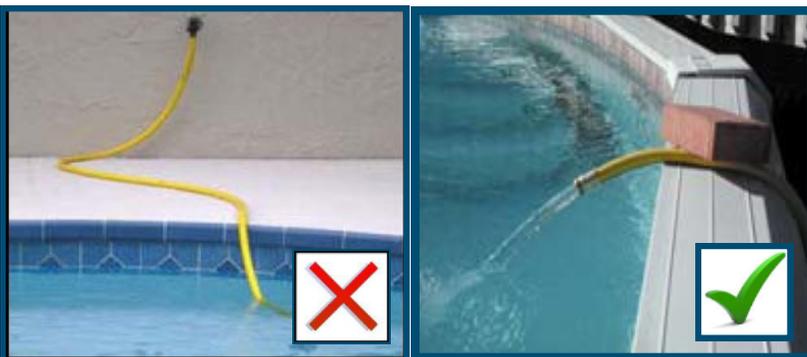
A cross connection is any actual or potential connection between the drinking water lines and potential sources of pollution or contamination such as a piping arrangement or equipment that allows the drinking water to come in contact with non-potable liquids, solids, or gases hazardous to humans in event of a backflow.

What is a backflow?

Backflow is the undesired reverse of the water flow in the drinking water distribution lines. This backward flow of the water can occur when the pressure created by equipment or system such as a boiler or air conditioning system is higher than the water pressure inside the water distribution line (back pressure), or when the pressure in the distribution lines drops due to routine occurrences such as water main breaks or heavy water demand causing the water to flow backward inside the water distribution system (backsiphonage). Backflow is a problem that many water consumers are unaware of, a problem that each and every water customer has a responsibility to help prevent.

Simple steps to prevent cross connection hazards:

- Never submerge a watering hose into a pool, tubs, sink, bucket of soapy water, pet watering containers, drains, or chemicals.
 - Always leave an air gap between the hose and the object you are filling.
 - Install a hose bib vacuum breaker on every threatened water fixture. These can be found at most hardware stores and are easy to install.



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](http://water.epa.gov/infrastructure/drinkingwater/pws/crossconnectioncontrol/index.cfm) You can also call the Safe Drinking Water Hotline at (800) 426-4791.

Stormwater = NPDES

Water pollution degrades surface waters making them unsafe for drinking, fishing, swimming, and other activities. As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating “point sources” that discharge pollutants into waters of the United States.

Point sources are often discrete conveyances such as pipes or man-made ditches or drains (catch basins) that direct “stormwater” to a surface source. Stormwater runoff is generated when precipitation from rain and snowmelt events flows over land or impervious surfaces (paved streets, parking lots, and building rooftops), and does not percolate into the ground. As the runoff flows over the land and impervious surfaces it accumulates debris, chemicals, sediment or other pollutants that could adversely affect water quality if the runoff is discharged untreated into our river or tributaries.

Federal and state laws and regulations require municipalities with a storm drain system to manage and control all stormwater discharges in their city and they, along with everyone who wants to discharge any type of water with pollutants, must first obtain an NPDES permit to do so.

If you see a suspicious discharge to a body of water or storm drain (catch basin, slotted manhole, etc.), please contact Methuens Engineering Department at (978) 983-8550.

Stormwater tips:

1. Don't dump anything into storm drains. Dispose of hazardous waste through Methuen's on-going waste oil collection program and bi-annual hazardous waste collection days.
2. When watering your lawn, don't over water. Water that runs off sidewalks and roadways carries contaminants (oil, grease, and metals) into our storm drain system.
3. Divert runoff from pavement to grassy, planted, or wooded areas of your property.
4. Reduce fertilizer and pesticide use.
5. Sweep up salt and sand on your walkways after snowmelt. Don't hose down driveways or sidewalks.
6. Inspect your vehicles and equipment for leaking and damaged parts.



Water Conservation

- Check every faucet in your home for leaks. Just a slow drip can waste 15 to 20 gallons a day. Fix it and you can save almost 6,000 gallons per year.
- Check your toilets by putting in a few drops of food coloring in the tank. If you have a leak the color will show up in the bowl after a few minutes. It is not uncommon to lose up to 100 gallons a day from an invisible toilet leak. Fix it and you save more than 30,000 gallons a year.
- Use your water meter to detect hidden leaks. Simply turn off all taps and water-using appliances. Then check the meter after 15 minutes. If it moved, you have a leak.
- Install water saving shower heads and low-flow faucet aerators.
- Take shorter showers. You can conserve 5 to 10 gallons of water per minute.
- Turn off the water to brush your teeth or shave. You can save 4 to 10 gallons of water each day.
- Insulate your water pipes. You will get hot water faster and avoid wasting water while it heats up.
- Store drinking water in safe reusable bottles inside the refrigerator. Running tap water to cool it off before drinking is wasteful.

Water Facts

- Water covers 70.9% of the Earth’s surface.
- Only 3% of Earth’s water is fresh water.
- Only 1% of the fresh water is available for drinking water.
- The human body is 75% water.
- Water can dissolve more substances than any other liquid including sulfuric acid.
- More than 25% of bottled water comes from a municipal water supply, the same place that tap water comes from.
- Approximately 400 billion gallons of water are used in the United States per day.
- Taking a bath requires up to 70 gallons of water. A five-minute shower uses only 10 to 25 gallons.
- Water is the only substance found on earth naturally in three forms: solid, liquid and gas.



Information on the Internet

The U.S. EPA Office of Water (<https://www.epa.gov/aboutepa/about-office-water>) and the Centers for Disease Control and Prevention (www.cdc.gov) websites provide a substantial amount of information on many issues relating to water resources, water conservation, and public health. Also, the MassDEP has a website (www.mass.gov/dep) that provides complete and current information on water issues in Massachusetts, including valuable information about our watershed.



Non Compliance to Compliance

On June 21, 2016 Methuen was notified by Massachusetts Department of Environmental Protection (MassDEP) that a sampling location audit was conducted for the 2015 Lead and Copper Rule monitoring. It was determined that one or more lead and copper samples were collected from sites not the approved Lead and Copper Sampling Plan, constituting a violation of 310 CMR 22.06B(7)(b). Corrective actions were taken and a revised/updated sampling plan was submitted and approved. The city of Methuen is now in compliance.

Need Answers?

We encourage you to share your thoughts with us on the information contained in this report. Should you ever have any questions about this report or relating to your drinking water please call the water treatment plant at **(978) 983-8845** If you have questions regarding your water bills, please call the water department at **978-983-8555**.

