TOWN OF PAXTON



2016 Water Quality Report – Public Water Supply #2228000



Consumer Confidence Report

This report contains important information about your drinking water. It is designed to inform you about where your drinking water comes from, how it's treated, the results of the water quality testing, cross connection and conservation tips, and the services we deliver to you every day. Our constant goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts we make to continually improve our system, and to make certain that we are providing you with the best quality water possible from source to tap.

Paxton's Water Supply

Paxton purchases 100% of its drinking water from the City of Worcester. Worcester obtains its drinking water from ten active surface water sources, or reservoirs, located both in and out of the city. The watersheds for these reservoirs cover a total of 40 square miles. These reservoirs combined hold a total of 7,379,900,000 Gallons. The reservoirs are listed below.

- Lynde Brook Res. (Leicester) 717.4 Million Gallons (MG)
- Kettle Brook Res. No.1 (Leicester) 19.3 MG
- Kettle Brook Res. No.2 (Leicester) 127.3 MG

- Kettle Brook Res. No.3 (Leicester, Paxton) 152.3 MG
- Kettle Brook Res. No.4 (Paxton) 513.7 MG
- Holden Res. No.1 (Holden) 729.3 MG

- Holden Res. No.2 (Holden) 257.4 MG
- Kendall Res. (Holden) 792.2 MG

- Pine Hills Res. (Paxton, Holden, Rutland) 2,971.0 MG
- Quinapoxet Res. (Holden, Princeton) 1,100.0 MG

In addition to these ten active reservoirs Worcester also has two additional reservoirs that are inactive, and two groundwater sources which come from two different wells (also inactive): the Coal Mine Brooke Well located on Lake Avenue North in Worcester, and the Shrewsbury well located off Holden Street in Shrewsbury. These four additional inactive sites are an excellent emergency water source.

The <u>first barrier</u> of protection for any water supply is to have, and maintain a clean source of water. To protect a surface water supply, the land within in the water shed must be controlled. The land within the Water shed that the city of Worcester controls is patrolled regularly in order to maintain, and protect the water supply. However, not all of the land in the reservoir's water shed is owned, or controlled by the city of Worcester. Some of the land within the Water shed is privately owned, and some of the activities held on those lands could pose a threat to water quality in the reservoirs.

The potential threats to the water supply within those privately owned lands include, but are not limited to: dairy farms, livestock operations, manure spreading and/or storage, pesticide storage and/or use, railroad tracks, aquatic life, landfills and dumps, power line right of ways, storm water discharge, highways and roadways. If you are a land owner within the water shed of a drinking water supply please keep in mind that what you do on your land has the potential to contaminate the water supply, so be conscious of what you do, and how you do it for the benefit of you, your neighbors, and your fellow townsfolk.

THE U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) WANTS YOU TO KNOW

All 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 the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (1-800-426-4791).

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 accruing minerals, and in some cases, radioactive material, and can pick up substances resulting from the presence of animal or human activity.

Contaminants that may be present in source water include:

<u>Microbial Contaminants</u>, such as viruses and bacteria, which may come from sewerage treatment plants, septic systems, agricultural livestock operations, and wildlife.

<u>Inorganic Contaminates</u>, such as salts and metals, which can be naturally occurring, or result from urban storm water runoff, industrial, or domestic wastewater discharges, oil and gas production, mining, and farming.

Pesticides and herbicides, which may come from a variety of sources such as agricultural, urban storm water runoff, and residential uses.

<u>Organic Chemical Contaminants</u>, Including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can, also, come from gas stations, urban runoff, and septic systems.

Radioactive Contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

To ensure that tap water is safe to drink, the Environmental Protection Agency (EPA), and the Massachusetts Department of Public Health (DPH) prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and drug administration and Mass DPH regulations establish limits for contaminants in bottled water as well, which must provide the same protection for public health.

SOURCE WATER ASSESSMENT PROTECTION AGENCEY (SWAP) REPORT

The Massachusetts Department of Environmental Protection (DEP) has completed a source water assessment program report for our reservoirs supplying the Paxton Water system. The purpose of SWAP is to identify potential threats to our water supply sources so we can take appropriate action to improve source protection.

The susceptibility to contamination for Worcester's water sources was ranked high. This means there is at least one high threat land use within the key water supply areas surrounding the reservoirs. These land uses have the potential to add contaminants to the supply source. Some of these high threat uses are: Dairy Farms, Manure Spreading or Storage, Pesticide storage or use, Landfills and dumps.

Worcester has been commended by DEP for taking an active role in promoting source water protection measures. For a complete copy of the SWAP Report please call the Worcester Water Department at 1-508-799-1484.

We at the Paxton Water Department work around the clock to provide top quality water to every tap. We ask that all our customers help us to protect our water sources, which are the heart of our community, our way of life, and our children's future.

More information on watershed protection is available in the Source Water Assessment & protection (SWAP) report prepared by the Department of Environmental Protection Agency (DEP) in 2002 and is available from the Paxton Water Department by calling (508)753-9077 or at www.mass.gov/dep/water/drinking/2348000.pdf.

Immuno-Compromised Persons

Some people may be more vulnerable to contaminants in drinking water than the general population. Immune-compromised persons such as a person with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS, or other immune system disorders, some elderly, and infants can be particularly at risk for infections. These people should seek advice about drinking water from health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water hot line (1-800-426-4791).

Water Treatment

Protecting the water supply is not enough to assure that we are able to supply you with safe and adequate drinking water. All drinking water, including bottled water, begins as rainfall, or snow melt. As this water travels over the surface of the land, and is absorbed into the ground, it dissolves naturally occurring minerals, and in some cases, radioactive material, and can pick up substances or contaminants that occur do to the presence of human, and/or animal activity. Although many of these substances and contaminants may be removed or reduced by natural processes before it reaches the water supply, some may enter into the water supply.

Water treatment is necessary as the <u>second barrier</u> of protection. The water treatment process reduces the levels of contaminants to a safe range, and can effectively eliminate some substances, but it will not remove all traces of all possible contaminants. Drinking water, including bottled water, may reasonably be expected to contain at least some small amounts of some contamination. 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 Environmental Protection Agency's (EPA's) Safe Drinking Water Hotline at 1 (800) 426-4791.

The city of Worcester treats the water through Ozonation, Coagulation & Flocculation, filtration, and disinfection to remove or reduce harmful contaminants that may come from the source water. Listed below are the methods that the City of Worcester used to treat the drinking water that entered the Town of Paxton in the 2016 calendar year.

- **Ozonation** Generated on-site at the treatment plant, ozone disinfects and breaks down organic matter making the water more efficiently filtered. This is the most effective disinfectant for the parasites giardia, & cryptosporidium.
- **Coagulation & Flocculation using** cationic polymer and alum to make tiny particles in the water stick together to form larger particles, which can then be better trapped in the filters.
- **Direct Filtration** This removes particles from the water using coal and sand filters.
- PH Adjustment Lime (calcium oxide) is added to make the water less acidic, and less corrosive.
- Disinfection with Chlorine to kill bacteria and other microorganisms.
- Corrosion Control A blended phosphate corrosion inhibitor is added to make the water less corrosive.

Distribution System

In 2016, the Paxton Water Department distributed 107,120,765 gallons of water to our customers. All of our water is purchased pretreated from the city of Worcester. The town of Paxton's water distribution system is made up of varying types of pipe that range in sizes from 3/4" to 12" pipe. The water mains alone add up to 40.28 miles of pipe (this number is not including service pipes that run from the water main into the house, building, or structure at your location). There is a pump station that houses two pumps (a primary, and a secondary pump) that move all of the water entering from the City of Worcester into the town of Paxton. The water travels from the pump station through the distribution lines and into one of the two Water Storage Tanks that house a total of 1.2 million gallons (MG) of water. The water then travels from the water storage tanks throughout the distribution system through water mains ranging in sizes from 1" to 12" pipe. The water then travels out of the water mains through your water service pipe in order to make it to your tap. It is our responsibility to make certain that when you open that tap that you have Safe and adequate drinking water. We at the Paxton Water department take pride in what we do, and work continuously to make sure that the water you receive is Safe, and adequate every time you open your tap.



Maple Street Water Storage Tank

2016 Water Quality Testing Results

The following results are from sampling done in 2016 calendar year, or during the most recent monitoring period for each contaminant group.

Substance	Date	Highest	Range	MCL or	MCLG or	Violation	Possible Sources	
(Contaminant)	Collected	Level		MRDLG	MRDLG	(Yes/No)		
(Detected				(133,113)		
		Detected						
Inorganic Contaminants								
Barium	2016	0.013 ppm	N/A	2.0ppm	2.0ppm	No	Erosion of natural deposits	
Manganese	2016	0.021 ppm	N/A	Unregulated ¹³	Unregulated ¹³	No	Erosion of Natural Deposits	
Nickel	2016	0.001 ppm	N/A	Unregulated ¹	Unregulated ¹	No	Discharge from domestic	
				ORSG: 0.1ppm			wastewater, landfills, and	
							mining/smelting operations	
Sodium	2016	10.5 ppm	N/A	Unregulated¹-	Unregulated ¹	No	Naturally present in the	
				ORSG: 20ppm			environment; road salt.	
			Volatile Org	anic Contaminants	(VOC's)			
Para-Dichlorobenzene	2016	0.7 ppb	<0.5-0.7	5 ppb	5 ppb	No	Discharge from industrial	
			ppb				chemical factories	
Monochlorobenzene	2016	1.9 ppb	<0.5-1.9	100 ppb	100 ppb	No	Discharge from chemical and	
			ppb				agricultural chemical factories	
O-Dichlorobenzene	2016	0.6 ppb	<0.5-0.6	600 ppb	600 ppb	No	Discharge from industrial	
			ppb				chemical factories	
Dicholormethane	2016	2.2 ppb	<0.5-2.2	5 ppb	0 ppb	No	Discharge from pharmaceutical	
			ppb				and chemical factories	
			Synthetic Org	anic Contaminar	nts (SOC's)			
None detected in the	samples collecte	ed						
Radioactive contaminants (no samples required for 2015)								
Gross Alpha Activity		0.56 pCi/L	N/A	15.0 pCi/L	0 pCi/L	No	Erosion of natural deposits	
Radium 226 & 228		<0.43 pCi/L	N/A	5 pCi/L	0 pCi/L	No	Erosion of natural deposits	

¹Unregulated means that USEPA has not set a **Radium** MCL for this contaminant.

Microbiological Contaminants

Total Coliform Bacteria are a group of bacteria that serve as indicators of potential water quality problems. Total Coliform Bacteria are naturally present in the environment in soil, vegetation, and surface water. (Certain types of Total Coliform can survive in water distribution systems despite the presence of chlorine.) Total Coliform Bacteria are used as an indicator, and if they are found in any of the routine monthly samples taken the samples must then be tested for Fecal Coliform. The Paxton Water Department currently collects 6 coliform bacteria samples each month throughout the distribution system, and 1 sample at the entry point of the system (Where the water enters from the city of Worcester). All monitoring locations are approved by the Massachusetts Department of Environmental Protection (MASS DEP), and are spread throughout the distribution system. A total of 84 Samples were drawn in 2016, and were analyzed for Total Coliform. All the samples taken came back absent of any Total Coliform.

Beginning April 1ST 2016, under new regulations, compliance with the MCL for Microbiological Contaminants change to having no E. coli-positive samples, and no treatment technique violations necessitating a sanitary assessment. Compliance with the MCL for E. coli still requires routine sample collection and monitoring of Total Coliform Bacteria. If any routine samples are found to be Coliform-positive they are then analyzed to determine if E. coli is present in the sample. In 2016 there was no presence of fecal coliform or E coli found in any of Paxton's water, and no Sanitary assessments were required.

²The MCL for Beta Particles is 4 mrem/year. EPA considers 50 pCi/L to be the level of concern for Beta particles.

³The EPA has set a health advisory for Manganese of 0.3ppm

Bacteria	Highest # of Positive Samples in a Month	MCL	MCLG	Violation (Yes/No)	Possible Sources
Total Coliform	N/A	Presence in more than 5% of monthly Samples	0 Positive	No	Naturally present in the environment.

<u>Fecal Coliform</u> are a group of bacteria that thrive at warmer temperatures such as those found in the gut-tract of warm blooded animals. The presence of Fecal Coliform may be a cause for concern since these organisms are sometimes, but not always, associated with sewage, or human/animal waste. In 2016 there was no presence of fecal coliform or E coli found in any of Paxton's water, and no sanitary assessments were required.

Bacteria	Highest # of Positive Samples in a Month	MCL	MCLG	Violation (Yes/No)	Possible Sources
Fecal Coliform or E.coli	0	*	0	No	Human and animal fecal waste

^{*} Compliance with Fecal Coliform / E coli MCL is determined upon additional repeat testing.

<u>Turbidity</u> Is the cloudiness or haziness of the water caused by large numbers of individual particle's that are generally invisible to the naked eye. The measurement of Turbidity is a good indicator of the effectiveness of the filtration system.

Turbidity								
Contaminant	Maximum Turbidity Measured	% of Measurements Below Turbidity Limit	Number of Measurements Greater Than 1.0 NTU	Turbidity Limits (Combined for all filters)				
Turbidity (combined for all filters)	0.257 NTU	100%	0	Less than or equal to 0.3 NTU in 95% of monthly measurements, No measurement can exceed 1.0 NTU				

Notes: The state allows us to monitor for some contaminants less than once per year because the contaminants do not change frequently. Some of our data, though accurate, are more than one year old.

Lead and Copper

Lead and copper are contaminants with a very specific and unique set of rules for sampling, and testing. Lead and Copper don't contaminate the water at the source as many other inorganics do. Generally it enters the water once it has flowed to the consumer's home. These metals typically dissolve from the water pipes within your house if the water is corrosive. Lead typically comes from the Lead Solder that was used prior 1986, to connect the copper piping in the buildings water supply lines. The copper comes from the piping itself. Ingesting large amounts of copper from water can cause an upset stomach, but there are no long term health effects unless you suffer from Wilson's disease. Lead, on the other hand is known to cause learning impairments in young children, and may cause delays in mental and physical development. Elevated lead ingestion is also known to cause kidney problems, and/or high blood pressure in adults. Elevated lead in water taken from the tap can cause serious health problems, especially in young children, and pregnant women. Lead in your drinking water is primarily from the materials which make up the plumbing inside the home. The Paxton Water Department is responsible for providing high quality drinking water, but cannot control the variety of

materials associated with home plumbing. After your water has been sitting unused for several hours you can minimize the potential for lead exposer by flush the tap for 30 seconds, to two minutes before using the water for drinking, cooking, or making formula. 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 your exposure to lead can be found through the Safe Drinking Water hot line, or at http://www.epa.gov/safewater/lead.

Lead and	Date	90th	Action	MCLG	# of sites	# of Sites Above	Exceeds Action	Possible Sources
copper	collected	Percentile	Level		Sampled	Action Level	Level (Y/N)	
Lead	2015	0.003mg/L	0.015 mg/L	0	20	1	No	Corrosion of
								household plumbing
Copper	2015	0.109mg/L	1.3 mg/L	1.3 mg/L	20	0	No	Corrosion of
								household plumbing

^{*}Lead and Copper compliance is based on the 90th percentile value, which is the highest level found in 9 out of every 10 homes sampled. This number is compared to the action level for each contaminant.

Other Analysis

The compounds in this table are general measures of water chemistry. There are no established limits for these compounds since they are not recognized as having significant health effects at levels found in drinking water. These compounds are sometimes referred to as secondary contaminants. At certain levels some of these may discolor the water or create a bad taste. Many of these measurements are made as another way to track the effectiveness of Worcester's treatment process.

Unregulated Contaminants tested by the city of Worcester	Range Detected By the City of Worcester	Possible Sources
Worcester		
Alkalinity	7.7 – 14.9 ppm	Naturally Occurring. Buffering capacity of water.
Aluminum	0.006 - 0.340 ppm	Natural sources and water treatment processes
Calcium	<0.001 – 12.0 ppm	Natural sources and water treatment processes.
Chloride	29 – 45 ppm	Natural and manmade sources
Conductivity	144 - 222 umhos/cm	An indirect measure of dissolved solids.
Hardness	7 - 35 ppm	Naturally occurring. An indirect measure of Calcium & Magnesium.
Iron	<0.005 – 0.990 ppm	From natural sources and old water mains.
Orthophosphate	0.406 – 0.930 ppm	Added to the water during treatment as a corrosion inhibitor.
PH	7.06 – 8.32 units	Measurement of the acidity or basicity of the water.
Sulfate	7.6 – 13.4 ppm	Natural sources and water treatment processes.
Temperature	2 – 26 degrees Celsius	Natural processes.

Total Organic Carbon	1.67 – 2.42 ppm	Natural sources.
Total Phosphate	0.72 – 2.29 ppm	Added to the water during treatment as corrosion inhibitor.
Zinc	<0.001 – 0.017 ppm	Natural sources; galvanized pipes

Disinfection and Disinfection Byproducts

Chlorine is a disinfectant used to kill bacteria and microorganisms in drinking water. Its use is recognized as one of the most important public health measures ever taken in the modern world. New federal regulations limit the maximum amount of residual chlorine that can be present in the distribution system to 4.0ppm.

Substance (disinfectant or Byproduct)	Maximum Level Detected (HRAA) ¹	Range Detected	MCL (MRDL) ²	MCLG (MRDLG) ³	Violation (Y/N)	Typical Source of Contaminant
Total Chlorine	1.66 ppm	0.02 ppm – 1.68 ppm	4.0 ppm	4.0 ppm	No	Added during treatment.
Total Tri-halomethanes (THM's)	58 ppm	25.3ppb – 58 ppb	80.0 ppb	-	No	Byproducts of Chlorine Disinfection.
Halo acetic Acids (HAA's)	38.7 ppm	15.5 ppb – 38.7 ppb	60.0 ppb	-	No	Byproducts of Chlorine Disinfection.

¹Highest Running Annual Average. ²Maximum Residual Disinfectant Level. ³Maximum Residual Disinfectant Level Goal.

Cross Connection Information

The Paxton Water Department makes every effort to ensure that the water delivered to your home and/or business is clean, safe, and free of contamination. Our staff works very hard to protect the quality of the water delivered to you, our customers, from the time it enters into the system, until it reaches your homes and businesses. But what happens when the water reaches your home and/or business? Is there still a need to protect the water quality from contamination caused by cross connection? If so How?

What is a Cross-Connection?

A cross-connection occurs whenever the drinking water supply is, or could be in contact with potential sources of pollution or contamination. Cross-connections exist in piping arrangements or equipment that allowed the drinking water to come in contact with non-potable liquids, solids, or gasses (hazardous to humans) in the event of a backflow, or backsiphonage.

What is a backflow or backsiphone?

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

What can you do to help prevent a cross-connection?

Without the proper protection something as simple as a garden hose has the potential to contaminate or pollute the drinking water lines in your house. In fact over half of the country's cross-connection incidents involved unprotected garden hoses. There are very simple steps that you can take as a drinking water user to protect, and prevent against hazards your water:

- NEVER submerge a hose in soapy water buckets, pet watering containers, pools, tubs, drains, or chemicals.
- NEVER attach a hose to a garden sprayer without the proper backflow preventer.
- Buy and install hose bib vacuum breakers in any threaded water fixture. The instillation can be as easy as attaching a garden hose to a spigot. This inexpensive device is available at most hardware stores and home-improvement centers.
- Identify and be aware of potential cross-connections to your water line.
- Buy appliances and equipment with a backflow preventer already installed on it.
- Buy and install backflow prevention devices or assemblies for all high or moderate hazard conditions.

If you are the owner or manager of a property that is being used as a commercial, industrial, or institutional facility you must have your property's plumbing system surveyed for cross-connection by the Paxton Water Department. If your property has NOT been surveyed for cross-connection please contact the Paxton Water Department to schedule a cross-connection survey.

The Paxton Water Department would like to remind all of its customers with in-ground sprinkler systems that they must have the proper cross-connection devises to be in compliance with the DPW and DEP regulations. More education on cross connection is available at the town hall, or by contacting the Paxton Water Department at (508) 753-9077.

Glossary of Terms

90th Percentile – A statistical measure used in the Lead and Copper Rule. A test result at the 90th percentile level means that 90 percent of all the test results fall below that level.

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

<u>Distribution System</u> – The network of pipes, vaults, and storage tanks that bring water from the treatment plant to the homes and businesses where the water is used.

<u>Massachusetts Department of Environmental Protection (DEP)</u> – The State Agency responsible for setting and enforcing drinking water regulations in Massachusetts.

<u>Maximum Contaminant Level (MCL)</u> – The highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the MCLG's as feasible using the best available treatment technology.

<u>Maximum Contaminant Level Goal (MCLG)</u> – the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow for a margin of safety.

<u>Maximum Residual Disinfection Level (MRDL)</u> – The highest level of a disinfectant (chlorine, chloramines, chlorine dioxide) allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

<u>Maximum Residual Disinfectant Level Goal (MRDLG)</u> – The level of a drinking water disinfectant (chlorine, chloramines, chlorine dioxide) below which there is no known or expected health risk. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Mg/L – Milligrams per liter

NTU - Nephelometric Turbidity Units

Office Research and Standards Guideline (ORSG): This is the concentration of a chemical in drinking water at, or below which adverse health effects are unlikely to occur after chronic (life time) exposure. If exceeded, it serves as an indicator of the potential need for further action.

Ppb – Parts per billion

Ppm – Parts per million

pCi/L - picocuries per liter (a measurement of radioactivity)

<u>Secondary Maximum Contaminant Level (SMCL)</u> – These standards are developed to protect the aesthetic qualities of drinking water, and are not health based.

<u>Treatment Technique (TT)</u> – A required process intended to reduce the level of a contaminant in drinking water.

United States Environmental Protection Agency (USEPA) - The Federal Agency responsible for setting and enforcing drinking water regulations.

<u>Variances and Exemptions</u> – Is when State or EPA permission not to meet MCL or a treatment technique under certain conditions.

<u>Water Shed</u> – The land upon which rain falls then flows across as runoff that eventually collects into streams, rivers, lakes, ponds, and reservoirs. Watershed boundaries are determined by the topography with hills and mountains determining which direction the runoff will travel.

If you have any questions about this report or concerning your water utility, please contact either Mike Putnam (Paxton DPW director), or Travis Thibault (Paxton Water Dept. foreman) by calling (508) 753-9077, or by writing to this address: 107 Holden Road, Paxton, Ma. 01612. We at the Paxton Water Department want to make certain that all of our customers are informed about their drinking water, and their water utility. We welcome any of our customers to attend the Water Board meetings which are held monthly. The dates, times, and locations are posted at the Town Hall (697 Pleasant Street) in Paxton.