



WOODLAND WATER DISTRICT AUBURN MASS.

2016 ANNUAL WATER QUALITY REPORT

The following is the 2016 annual report published on the quality of drinking water supplied to the customers of the Woodland Water District during the 2016 calendar year as prepared by the Auburn Water District.

Woodland Park Water District was chartered in 1935 by Chapter 585 of the Acts of 1935 of the Commonwealth of Massachusetts General Laws. It operated as such until it was unchartered by an Act of Legislature in 2004 and became part of the Auburn Water District, which assumed the operation and maintenance of the Woodland Water District including but not limited to making repairs, billing and performing all water testing required by the Massachusetts Department of Environmental Protection (MassDEP) as well as being responsible for preparation of all required reports, including this document.

Presently the Woodland Water District has 186 service connections serving less than 500 persons. All water supplied to the customers of the Woodland Water District is purchased from the City of Worcester, entering the Woodland Water District distribution system through a single master meter.

In as much as the Woodland Water District receives all its water from the City of Worcester, versus from its own sources, it is still necessary to prepare a separate Consumer Confidence Report in addition to that prepared by the City of Worcester, for the Woodland Water District of which a copy is attached. The Woodland Park Water Districts is fully compliant with all health and safety standards established by Federal and State regulations for public water systems.

SOURCES OF SUPPLY

In the eyes of MassDEP, since the Woodland Water District's source of water is separate from the Auburn Water District, the Woodland Water District maintains its own identity as a public water supplier, having a MassDEP Public Water Supplier identification of 2017002, which is separate from that of the Auburn Water District.

During 2016 the region experienced severe drought conditions that were the worst seen since the 1965 Drought resulting in water levels in the Worcester reservoirs were at critical levels resulting in a Stage III Drought Warning which prohibited a mandatory ban on all non-essential outdoor water use.

Through a more normal winter season and a wet spring, water levels have returned to normal levels resulting in a retraction of all water bans / restrictions. We wish to thank the Woodland Water District customers for their water conservation efforts and compliance with the water use bans / restrictions during these trying times.

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WATER TREATMENT

All of Worcester's drinking water is treated at the Worcester Water Treatment Facility. Including the water supplied to the customers of the Woodland Water District. Since the City of Worcester supplies water to the Woodland Water District, the City of Worcester Water Quality Report is incorporated as part of this report.

The Woodland District is supplied with water from the City of Worcester distribution system. The Woodland Water District, as a public water supplier, is required by MassDEP to periodically perform its own testing including testing for microbial contaminants (bacteria), lead and copper, and radioactive contaminants. Recently imposed additional water testing include analysis for trihalomethanes and haloacetic acids

TOTAL COLIFORM BACTERIA TESTING

Total Coliform Bacteria is a group of bacteria that serve as indicators of possible water quality problems. Bacteria in the Total Coliform group are not necessarily harmful but, when detected in drinking water, may indicate conditions could be right for the presence of more harmful microorganisms. Samples are taken monthly at two locations in the Woodland Water District. During calendar year 2016, all of the monthly bacteria test came back negative for any total bacteria.

LEAD AND COPPER TESTING

Lead and copper are inorganic contaminants for which the Massachusetts Department of Environmental Protection (MassDEP) requires special testing. Unlike other contaminants, the source of copper and lead in drinking water are, in most cases, is attributed to the copper piping and lead solder jointed plumbing within in your home.

Since Woodland Water District receives its water from Worcester, the Woodland Water District lead and copper compliance is based on Worcester's DPW water operations sampling and treatment program. Woodland Park did have a violation of the Lead and Copper program for 2008. This violation resulted in testing for Lead and Copper to be increased once every 3 years to once every six months until such time that we are back in compliance.

The Auburn Water District arranges for water samples taken by the customers at pre-determined approved locations to be delivered to the laboratory at the City of Worcester Filtration Plant for analysis. The results thereof are reported in the attached City of Worcester Water Quality Report.

In spite of the reports that the water is in compliance for lead and copper, if you are still concerned about lead or copper levels in your homes water, you may elect to run the tap for 30 seconds to 2 minutes before you use the water for drinking, cooking, or making baby formula. This assures you will be getting water from the main and not the water that has been standing in your household plumbing. If you are still concerned about lead in your water you may want to get it tested at a MassDEP currently approved water testing laboratory. Based on the indicated results for lead and copper, the Woodland Water District has been placed on a multi-year cycle for future sampling of lead and copper. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline, 1-800-426-4791.

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TRIHALOMETHANES AND HALOACETIC ACID TESTING

Trihalomethanes and haloacetic acids are chemical compounds which are byproducts of treatment of disinfecting of the drinking water by chlorination and the chlorine reacts with naturally occurring organic compounds. The EPA and MassDEP have developed standards for acceptable levels of trihalomethanes and haloacetic acids in drinking water. The benefits of the chlorination of the water and elimination of bacterial contaminants far outweigh the risk associated with low acceptable levels of these compounds in drinking water. The Auburn Water District periodically samples the water in the Woodland Water District at pre-determined MassDEP locations at a frequency determined by MassDEP. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline, 1-800-426-4791.

TESTING RESULTS

The results of all testing of Woodland Parks water can be found in the City of Worcester Consumer Confidence Report (Water Quality Report) which is enclosed in this packet. If you have any questions about the information contained in the City of Worcester Water Quality Report, please contact Mr. Phil Guerin, Director of Water & Operations for the City at (508) 929-1000.

EDUCATIONAL MATERIAL

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.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised 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 can be particularly at risk of infection. These people should seek medical advice about drinking water from their health care providers. EPA/CDC guidelines on approximate means to lessen the risk of infection by cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Waterline, 1-800-426-4791.

WOODLAND WATER DISTRICT SYSTEM INFORMATION

In as much as the Woodland Water District, maintains its own identity as a public water supplier, since 2004 its operation has been incorporated seamlessly into the operations of the Auburn Water District. The Auburn Water District operates under its' elected Board of Water Commissioners, which meet monthly, generally on the third Wednesday, at 9AM at the Auburn Water District Office which is located at 75 Church St., Auburn MA 01501 with a mailing address is P.O. Box 187, Auburn, MA 01501. The normal business hours are M-F 8AM to 4PM. The telephone number is **(508) 832-5336**.

Should you have any questions regarding this report please do not hesitate to contact Kenneth R. Smith, Water Superintendent, at (508) 832-5336.

Please visit our website at www.auburnwater.com for additional information, including an electronic posting of this report.

English

This is an important notice.
 Please have it translated.

Greek

Αυτή είναι μια σημαντική
 ειδοποίηση. Παρακαλούμε να
 το μεταφράσετε.

Italian

Ciò è un avviso importante.
 Prego traducalo.

French

C'est une annonce de votre eau
 potable. Parlez s'il vous plaît
 avec quelqu'un qui comprend.

Spanish

Esto es un aviso importante. Por
 favor tenga esto traducido.

Polish

To sprawozdanie zawiera infor-
 macje na temat jakości wody,
 przetłumacz je lub porozmawiaj z
 osobą która je dobrze rozumie.

Vietnamese

Đây là một thông báo về nước
 uống của bạn. Xin nói với người
 mà hiểu.

**This report
 contains important
 information about
 your drinking water.**

The Worcester Water Operations Division of Worcester's Department of Public Works & Parks is dedicated to providing a safe, reliable, potable water supply today, and to protect the availability of that supply for the future.

Spread the word.

If you are a property owner who rents or leases your property, please forward a copy of this important report to your tenants, or inform them that copies are available at the business office.



Quinapoxet Reservoir - August 2016

Drought: 2016 brought the most significant drought since that of the late 1960s. By early September water storage had reached critical levels and a Stage 3 Drought Emergency was declared. Worcester customers heard the call to conserve and should be commended for their efforts.

Consumer Confidence Report

We are pleased to present to you this year's Water Quality Report for the City of Worcester. In this report you'll find information about the **four barriers of protection** in place to ensure the highest quality drinking water from our sources to your tap.

This report for the calendar year 2016 includes:

- ◆ Where Your Water Comes From
- ◆ Water Quality Test Results
- ◆ How Your Water Is Treated
- ◆ Cross Connection and Conservation Tips

Your Water Meets all Federal and State Standards

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, USEPA and MassDEP prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The 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, Worcester DPW&P Water Operations can be sure that your drinking water is safe.

Immuno-Compromised Persons

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised 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 can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/Centers for Disease Control and Prevention (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Your Water Supply

Worcester obtains its drinking water from 10 surface water sources, or reservoirs, located outside of the City. The watershed for these reservoirs covers 40 square miles. These reservoirs, totaling a combined storage capacity of 7,379.9 Million Gallons (MG) are:

• Lynde Brook Res. (Leicester)	717.4 Million Gallons
• 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. 2 (Holden)	257.4 MG
• Holden Res. No. 1 (Holden)	729.3 MG
• Kendall Res. (Holden)	792.2 MG
• Pine Hill Res. (Paxton, Holden, Rutland)	2,971.0 MG
• Quinapoxet Res. (Holden, Princeton)	1,100.0 MG

In addition to these 10 active reservoirs, other sources of water supply remain inactive but could be used in the case of an emergency. These additional supplies include two wells and two reservoirs; the Coal Mine Brook Well on Lake Ave North in Worcester and the Shrewsbury Well off Holden Street in Shrewsbury, the Wachusett Reservoir and the Quabbin Aqueduct.

A small area around Mountain Street West is supplied with water purchased from the Town of Holden. This area includes Mountain Street West from #157 to the Holden line (including Stratton Hill Apartments), Maravista Road, Maranook Road, Wendover Road, and the first 500 feet of Lanesboro Road Relocated. These residents will receive a similar Water Quality Report from the Town of Holden.

First Barrier: Protected Water Supply

The **first barrier** of protection for any water supply system is to have clean sources of water. To protect a surface water supply one must control the land within the watershed surrounding the supply. Worcester has maintained very strict control over the land it holds for water supply protection. However, not all of the land in Worcester's watershed is owned or controlled by the City. On some of those privately owned lands activities occur that could pose a threat to water quality in the reservoirs.



The potentially threatening land uses include: dairy farms, livestock operations, manure spreading or storage, pesticide storage and use, railroad tracks, aquatic wildlife, landfills and dumps, power line rights of way, stormwater discharges, highways and roadways. Overall, Worcester's water supplies are considered highly susceptible to contamination.

More information on watershed protection issues is available in the Source Water Assessment & Protection (SWAP) report prepared by DEP in 2002 and available from Worcester DPW&P Water Operations by calling 508-929-1300 or at www.mass.gov/dep/water/drinking/2348000.pdf.

Second Barrier: Water Treatment

Protecting our water sources is not enough to assure that your tap water is safe to drink. All drinking water, including bottled water, begins as rainfall or snowmelt. As this water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and can pick up substances resulting from the presence of animals or from human activity. Although some of these substances and contaminants will be removed or reduced by natural processes upon reaching a water supply, additional contaminants might directly enter the open waters of the supply.

Water treatment is necessary as the **second barrier** of protection. Treatment will reduce the levels of contaminants to a safe range and can effectively eliminate some substances but will not remove all traces of all possible contaminants. **Drinking water, including bottled water, may reasonably be expected to contain at least 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 EPA's Safe Drinking Water Hotline (1-800-426-4791).**

In calendar 2016, the Water Filtration Plant treated 8,242,681,000 gallons of water using the following processes:

- **Ozonation**—Generated on-site, ozone disinfects and breaks down organic matter making the water more efficiently filtered. This is the most effective disinfectant for the parasites giardia and cryptosporidium.
- **Coagulation & Flocculation using cationic polymer and alum** to make tiny particles in the water stick together to form larger particles, which can be better trapped in filters.
- **Direct Filtration**—This removes particles from the water using a coal and sand filter.
- **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.

Water Quality Testing Results for 2016

The following tables and descriptions provide a complete summary of all contaminants detected in Worcester's water in 2016. The tables may contain several terms and abbreviations that may be unfamiliar to you. To help you better understand these terms, we are providing the following important definitions.

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

HRAA: Highest Running Annual Average: the highest average result from quarterly samples taken within the distribution system. This average is used to determine compliance.

MRDLG: Maximum Residual Disinfectant Level Goal: the level of a drinking water disinfectant below which there is no known expected risk to health. This level does not reflect the benefits of the use of disinfectants to control microbial contaminants.

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.

MCLG: Maximum Contaminant Level Goal: 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.

MCL: Maximum Contaminant Level: the highest level of a contaminant that is allowed in drinking water. Set as close to the MCLG's as feasible using the best available treatment technology.

n/a: not applicable.

pCi/L: picocuries per liter (a measure of radiation)

ppm: parts per million; same as milligrams per liter (mg/L)

ppb: parts per billion; same as micrograms per liter (ug/L)

Distribution Water Quality

Microbiological Contaminants: Bacteria in the Total Coliform group are naturally present in the environment and are not necessarily harmful. We test for this group of bacteria because their presence indicate that conditions are right for the presence of more harmful microorganisms. The City of Worcester monitors for microbiological contaminants by collecting a minimum of 149 water samples in the City each month. Monitoring locations are approved by the Massachusetts Department of Environmental Protection (MassDEP) and are spread throughout the City so that the water being tested is truly representative of that water flowing from consumers' taps. A total of 1,791 samples were collected and analyzed for Total Coliform Bacteria in 2016.

Beginning April 1, 2016, under new regulations, compliance with the MCL for Microbiological Contaminants changed 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 and each coliform-positive sample is analyzed to determine if *E. coli* is present. **In 2016 there were NO Fecal Coliform, NO *E. coli* found in Worcester's water and NO sanitary assessments were required.**

Microbial Contaminants (Distribution System)						
Bacteria	Highest % Positive in a Month	Total # Positive	MCL	MCLG	Possible Sources	Violation
Total Coliform Bacteria	0.0 % positive	n/a	Presence in more than 5% Of monthly samples	0 positive	Naturally present in the environment	No
<i>E. coli</i>	n/a	0 positive	*	0 positive	Human and animal fecal waste	No

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

Disinfection: 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 4.0 ppm. **Worcester's water contains about 25% of the maximum allowed.**

Disinfectant/ Disinfectant Byproduct	Maximum Level Detected	Range	MRDL	MRDLG	Typical Source	Violation
Total Chlorine	0.98 ppm ⁴	0.1-2.0 ppm	4.0 ppm	4.0 ppm	Added during treatment	No
Total Trihalomethanes	61 ppb ⁵	14-104 ppb	80 ppb	—	Byproducts of chlorine disinfection	No
Haloacetic Acids	39 ppb ⁵	12-52 ppb	60 ppb	—	Byproduct of disinfection	No
Turbidity	Maximum Turbidity Measured	Lowest Monthly % of Measurements Below Turbidity Limits	Number of Measurements > 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	

⁴ Highest Running Annual Average.

⁵ Highest Locational Running Average

Disinfection Byproducts: Disinfection byproducts are organic compounds produced when chlorine reacts with naturally occurring organic matter. Total trihalomethanes (TTHMs), a group of four compounds, and haloacetic acids (HAAs), a group of five compounds, are monitored in Worcester at eight representative monitoring locations, including locations expected to have the highest levels, on a quarterly basis. Compliance with the MCL is determined by the running annual average at each sampling location during the year (Locational Running Average). Some people who drink water containing THMs in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems and may have an increased risk of getting cancer. Three different locations had single samples that exceeded 80 ppb, those sites and their locational running averages (LRA) for each quarter are charted below. These levels are not a violation or cause for concern. **Worcester has never exceeded the MCLs for Total Trihalometnanes or Haloacetic Acids.**

Turbidity: Turbidity is a measure of the cloudiness of water in NTU (Nephelometric Turbidity Units) and is an indication of particulate matter, some of which may include harmful microorganisms. It is used primarily to determine the effectiveness of filtration. We measure turbidity continuously at each of the eight filters at the Water Filtration Plant, and as the combined water leaves the Plant. Turbidity itself is not harmful and does not cause illness.

Water entering the Water Filtration Plant has an average turbidity of about 0.80 NTU. The water leaving the Plant and entering the distribution system is at a more consistent level of about 0.05 NTU. **Worcester has never failed the standard for turbidity since the Filtration Plant began regular operation.**

TTHM Sites and their Locational Running Average					
Location	MRDL	Q1: Jan-Mar	Q2: Apr-Jun	Q3: Jul-Sep	Q4: Oct-Dec
Coppage Dr.	80 ppb	61.3 ppb	61.6 ppb	53.4 ppb	48.8 ppb
50 SW Cutoff	80 ppb	54.1 ppb	54.6 ppb	61.7 ppb	57.4 ppb
254 SW Cutoff	80 ppb	49.0 ppb	53.2 ppb	58.1 ppb	56.0 ppb

Source Water Quality

Inorganic Contaminants (IOCs): These chemicals can be naturally present in the rocks and soils surrounding a water supply or result from urban storm water runoff, industrial, or domestic wastewater discharges, oil, and gas production, mining, and farming.

Sodium is not regulated by the USEPA. The DEP Office of Research and Standards has set a state guideline (ORSG). These concentration levels have been developed to indicate whether further action is necessary to avoid adverse health risks and to protect the aesthetic quality of our drinking water.

The various health effects of IOCs include increased risk of cancer, liver or kidney damage, nerve damage or intestinal problems depending on the type of IOC present and the amount ingested.

Worcester's water supply is tested annually for all IOCs after water treatment but before entering the distribution system. Those listed were the only IOCs detectable. They all were at levels below the MCL limit. **Worcester has never exceeded the MCL for any IOCs.**

Organic Contaminants: Both VOCs and SOCs: These chemicals are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm runoff, and septic systems.

Worcester's water is tested for VOCs after water treatment but before entering the distribution system. Disinfection byproducts are also VOCs but are listed separately in this report.

SOCs were tested in the second and fourth quarters by collecting samples after treatment but before water entered the distribution system. These contaminants include pesticides, explosives and various other organics. **No SOC's were detected. Worcester's surface water supplies have never exceeded MCLs for any VOC's or SOC's.**

Radioactive Contaminants: These contaminants can be naturally-occurring or be the result of oil and gas production. They can enter water supplies from atmospheric fallout, runoff, illegal disposal of radioactive waste, or from contact with natural deposits of radioactive materials such as radon and uranium.

Since Worcester's reservoirs are not in an area of known sources of radioactive materials and have never had radioactive contaminants detected at a level of significance, our water can be tested less frequently.

In the 2016 sample, all measured contaminants were near the detection level for the instrument. **These levels are no cause for concern.**

Substance (Contaminant)	Maximum Level Detected	Range Detected	MCL	MCLG	Typical Source Of Contaminant	Violation
Inorganic Contaminants (IOCs)						
Barium	0.013 ppm	n/a	2 ppm	2 ppm	Erosion of natural deposits	No
Manganese	0.021 ppm	n/a	Unregulated ^{1,2}	Unregulated ^{1,2}	Erosion of natural deposits	No
Nickel	0.001 ppm	n/a	Unregulated ¹ ORSG: 0.1 ppm	Unregulated ¹	Discharge from domestic wastewater, landfills, and mining/smelting operations	No
Sodium	10.5 ppm	n/a	Unregulated ¹ ORSG: 20 ppm	Unregulated ¹	Naturally present in the environment; road salt	No
Volatile Organic Contaminants (VOCs)						
Para-Dichlorobenzene	0.7 ppb	<0.5-0.7 ppb	5 ppb	5 ppb	Discharge from industrial chemical factories	No
Monochlorobenzene	1.9 ppb	<0.5-1.9 ppb	100 ppb	100 ppb	Discharge from chemical and agricultural chemical factories	No
O-Dichlorobenzene	0.6 ppb	<0.5-0.6 ppb	600 ppb	600 ppb	Discharge from industrial chemical factories	No
Dichloromethane	2.2 ppb	<0.5-2.2 ppb	5 ppb	0 ppb	Discharge from pharmaceutical and chemical factories	No
Synthetic Organic Contaminants (SOCs)						
None detected in the samples collected						
Radioactive Contaminants						
Gross Alpha Activity	0.56 pCi/L	n/a	15 pCi/L	0 pCi/L	Erosion of natural deposits	No
Radium 226 & 228	<0.43 pCi/L	n/a	5 pCi/L	0 pCi/L	Erosion of natural deposits	No

¹ Unregulated means that USEPA has not set an MCL for this contaminant

² The USEPA has set a health advisory for manganese of 0.3 ppm

You can have confidence in the quality of your drinking water.

The DPW&P Water Operations monitors the water system 24 hours a day, 7 days a week. 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 a Certified Operator to the possible problem and staff are dispatched, as needed.

Distribution Water Quality (Continued)

Lead And Copper

For Lead and Copper compliance testing Worcester works cooperatively with the Elm Hill and Woodland Water Districts in Auburn, both of which purchase water from the City. These results are from 2014. Testing was not required in 2016.

In 2014 the Worcester-Elm Hill-Woodland system collectively met the standard for lead and copper as did each of the individual water systems.

The table below is for the 2014 joint sampling.

System	Contaminant	99 TH		MCLG	# of Samples Tested	Exceeds AL (Yes/No)	# of Samples Exceeding AL
		Percentile	AL				
Combined Results	Lead	3 ppb	15 ppb	0	103	No	3
For All 3 Systems	Copper	0.085 ppm	1.3 ppm	1.3 ppm	103		0
Worcester	Lead	2 ppb	15 ppb	0	88	No	2
	Copper	0.078 ppm	1.3 ppm	1.3 ppm	88		0
Elm Hill	Lead	2 ppb	15 ppb	0	10	No	0
	Copper	0.103 ppm	1.3 ppm	1.3 ppm	10		0
Woodland	Lead	10 ppb	15 ppb	0	5	No	1
	Copper	0.157 ppm	1.3 ppm	1.3 ppm	5		0

Lead and Copper: Worcester's source waters are lead-free. So is the water which travels to your home through mostly iron and steel pipes. Both copper and lead are primarily from materials and components associated with home plumbing and typically dissolve from the water pipes within your home if the water is corrosive. Lead usually comes from the lead solder used, prior to 1986, to connect copper pipes. The copper comes from the pipes themselves. The 90th percentile, used for compliance purposes in the table above, is a statistical measure used in the Lead and Copper Rule meaning that out of every 10 samples, 9 were at or below this level.

Copper is an essential nutrient. However, ingesting elevated levels may upset your stomach, but there are no long-term effects unless you suffer from Wilson's Disease. If this is the case, consult your personal physician. Elevated lead ingestion, on the other hand, may cause some serious health problems. Lead is therefore strictly regulated in drinking water.

Lead and copper are contaminants that have a very specific and unique set of rules for sampling and testing. Since they enter the water at the point of use (near the tap) sampling and testing for these metals must be done at the homes in the City rather than at the entry point to the distribution system. Samples had to be collected after the water went unused for at least six hours to allow for maximum contact between the water and the lead and copper.

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. Worcester DPW&P Water Operations has made great strides in reducing the corrosion of lead into drinking water and 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 30 seconds to 2 minutes before using water for drinking or cooking.** This is to assure that you will be getting safe water from the water main and not the water that has been standing in your plumbing. 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 <http://www.epa.gov/drink/info/lead/index.cfm>.

For compliance testing, Worcester works cooperatively with Elm Hill and Woodland Water Districts in Auburn. In 2014 the Worcester-Elm Hill-Woodland system collectively met the standard for lead and copper as did each of the individual water systems.

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 of tracking the effectiveness of Worcester's treatment processes.

SUBSTANCE	AVERAGE	RANGE DETECTED	TYPICAL SOURCE
Alkalinity	10.7 ppm	7.7-14.9 ppm	Naturally occurring. Buffering capacity of water.
Aluminum	0.045 ppm	0.006-0.340 ppm	Natural sources and water treatment processes.
Calcium	9.5 ppm	<0.001-12.0 ppm	Natural Sources and water treatment processes.
Chloride	33 ppm	29-45 ppm	Natural and manmade sources.
Conductivity	175 umhos/cm	144-222 umhos/cm	An indirect measure of dissolved solids.
Hardness	29 ppm	7-35 ppm	Naturally occurring. An indirect measure of Calcium and Magnesium.
Iron	0.063 ppm	<0.005-0.990 ppm	Natural sources and old water mains.
Orthophosphate	0.591 ppm	0.406-0.930 ppm	Added to water during treatment as corrosion inhibitor.
pH	7.4 units	7.06-8.32 units	Measure of the acidity or basicity of water.
Sulfate	11.4 ppm	7.6-13.4 ppm	Natural sources and water treatment processes.
Temperature	15 °Celsius	2-26 °Celsius	Natural processes.
Total Organic Carbon	2.0 ppm	1.67-2.42 ppm	Natural sources.
Total Phosphate	1.07 ppm	0.72-2.29 ppm	Added to water during treatment as corrosion inhibitor.
Zinc	0.004 ppm	<0.001-0.017 ppm	Natural sources and some galvanized plumbing material.

Third Barrier: System Improvements and Cross Connection Inspections

System Improvements: Distribution system investment and maintenance is an important component of the **third barrier**. Every year our staff of laborers, foremen, and engineers cooperating with private contractors work to construct, maintain, and improve infrastructure within the city so that the high quality drinking water we provide can reach every resident's tap safely and on demand. Every day, operations are under way to help improve system efficiency such as installing new water mains, domestic services and fire services, repairing or rehabilitating older mains and services, finding and repairing breaks and leaks in the system, installing and maintaining the system of hydrants, and exercising valves to ensure careful control of the distribution system.

Cross Connection Program: A comprehensive cross connection program is another part of the **third barrier** of protection of our water supply. Cross connections occur within the distribution system in all types of buildings including homes, factories, restaurants, and hospitals.

Plumbing cross connections exist whenever a pipe carrying drinking water has a direct physical connection to a source of potentially harmful materials. Wherever cross connections exist there is the potential for drinking water contamination. A cross connection can contaminate drinking water in the building where it is located or it can contaminate an entire neighborhood.

The most common cross connection found in homes and businesses is the unprotected faucet to which a hose can be attached. This can be easily corrected by installing a Hose Bib Vacuum Breaker (HBVB). This device will prevent the flow of contaminated water back into your plumbing and your drinking water. HBVB's can be attached to outside house and garden faucets, laundry tub faucets, service sinks, etc. Think of all the ways you use your faucets and garden hose.

HBVBs will protect you and your family from:

- ◆ detergents and other chemicals used in pressure washers; pesticides, herbicides and fertilizers used in hose end spray applicators,
- ◆ contaminants when a hose is used to flush out or remove a blockage from a sewer or drain pipe,
- ◆ heavily chlorinated pool water,
- ◆ rust inhibiting, anti-scale and anti-freeze chemicals used in heating and cooling systems.

These are a few examples of possible ways your drinking water can be contaminated through the use faucets and hoses. HBVB devices are inexpensive and are available at plumbing supply, hardware and home improvement stores. Simply screw the HBVB onto the threaded faucet outlet and protect your drinking water.

Massachusetts Drinking Water Regulations 310 CMR 22.22 requires all industrial, commercial and institutional facilities to be surveyed for cross connections and to be re-surveyed in intervals. Our team of Cross Connection inspectors works year-round to survey for and address all concerns.

Backflow Preventer Testing in 2016	
Total Number of Reduced Pressure Backflow Preventers (RPBP) in Worcester (2016)	3620
Total Number of Double Check Valve Assemblies (DCVA) in Worcester (2016)	1140
Total Number of Backflow Preventer Tests conducted in Worcester (2016)	7864

For more information on Worcester DPW&P Water Operations' Cross Connection Control Program please call DPW&P Water Engineering at 508-799-1493.

Fourth Barrier: Conservation and Responsible Use

YOU control the **fourth barrier** and can help prevent pollution and protect our water supplies.
—also—

Conserving water doesn't just mean using less water. It also means using water more efficiently.



- Collect drinking water after the cold water tap has been in use and keep it in the refrigerator. This makes pure, safe and cool drinking water available right when you want it.
- If you accidentally spill chemicals, oil or poison on the ground, clean it up with a rag. **NEVER try to wash it away with water!**

How to Contact the Water Division:

The Water Division's business office is located at 18 East Worcester St., Worcester, MA 01604

Normal business hours are Monday-Friday (holidays excluded) 8:30 a.m.—4:00 p.m.

You may call the Department's Customer Service Center with questions during regular business hours at (508)929-1300.

You may also call this number anytime if you experience a water emergency.

If you experience a service disruption or sudden change in quality, we want to know about it.

Log on to www.worcesterma.gov for detailed information about your water provider.

Additional copies of this report are available upon request.

If you have questions about this report or if your group or organization would like to meet to discuss drinking water issues please call Philip Guerin, Director of Water & Sewer Operations at 508-929-1300.

This report is also available on the web at

<http://www.worcesterma.gov/e-services/document-center/water-sewer/water-quality-report.pdf>