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Dear Customer,

The Massachusetts Water Resources Authority is pleased to share with you the results of our annual water quality testing. MWRA and your local water department take hundreds of thousands of water quality tests to ensure your water is safe. The results for 2017 are excellent and MWRA again met every federal and state drinking water standard.

Since the MWRA was created in 1984, we have invested over \$2 billion to rehabilitate and modernize the entire drinking water system. From state-of-the-art treatment, to covered storage tanks, to installing new redundant pipelines and replacing older pipes in the communities, we want to make sure the water that flows to your tap is of the highest quality. Investing in infrastructure improvements also plays a large part in the economic health of our region.

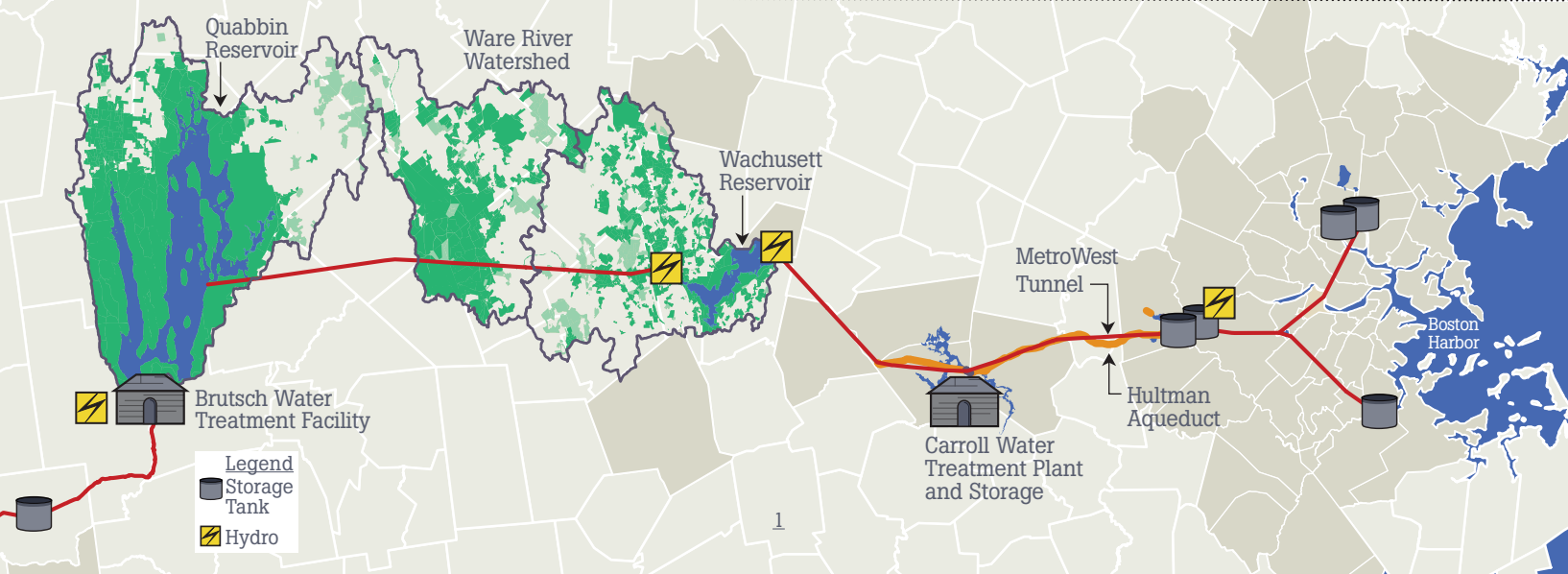
System-wide, MWRA has been below the lead action level for many years now, but there are still a number of lead service lines in our service area. Several of our member communities are taking advantage of our \$100 million zero interest loan program and others are getting ready to do so. Our laboratory staff processes samples from homes and school across the service area. We continue to partner with the Massachusetts Departments of Environmental Protection and Public Health to make every effort to reduce the risk of lead at the tap to protect the health of the children in our member communities. More information on lead can be found on pages 4 and 5 of this report.

This report contains important information about your water system and we hope you take a few moments to read through it. MWRA has great confidence in the water we deliver to your home and we want you to share that confidence. Please contact us if you have any questions or comments about your water quality or any of MWRA's programs.

Sincerely,

Frederick A. Laskey  
Executive Director

For more information on MWRA and its Board of Directors, visit [www.mwra.com](http://www.mwra.com).



**Drink Local And Be Green!** Tap water is delivered straight to your home without trucking or plastic waste. Bottled water produces over 10,000 times the amount of greenhouse gases as tap water. More than half of our energy needs for water treatment and delivery are met with green power including hydroelectric generators and solar panels.



**Why Your Water Tastes Great – High Quality Source Water**

Your water comes from the Quabbin Reservoir, about 65 miles west of Boston, and the Wachusett Reservoir, about 35 miles west of Boston. Water from the Ware River can also add to the supply at times. These pristine reservoirs supply wholesale water to local water departments in 51 communities. The two reservoirs combined supplied about 200 million gallons a day of high quality water to consumers in 2017.

The Quabbin and Wachusett watersheds are naturally protected with over 85% of the watersheds covered in forest and wetlands. To ensure safety, the streams and reservoirs are tested often and patrolled daily by the Department of Conservation and Recreation (DCR).

Rain and snow falling on the watersheds - protected land around the reservoirs - turn into streams that flow to the reservoirs. This water comes in contact with soil, rock, plants, and other material as it follows its natural path to the reservoirs. While this process helps to clean the water, it can also dissolve and carry very small amounts of material into the reservoir. Minerals from soil and rock do not typically cause problems in the water. But, water can also transport contaminants from human and animal activity. These can include bacteria and pathogens - some of which can cause illness. The test data in this report show that these contaminants are not a problem in your reservoirs' watersheds.

The Department of Environmental Protection (DEP) has prepared a Source Water Assessment Program report for the Quabbin and Wachusett Reservoirs.

The DEP report commends DCR and MWRA on the existing source water protection plans, and states that our “watershed protection programs are very successful and greatly reduce the actual risk of contamination.” MWRA follows the report recommendations to maintain the pristine watershed areas.

**Investing In Your Water System**

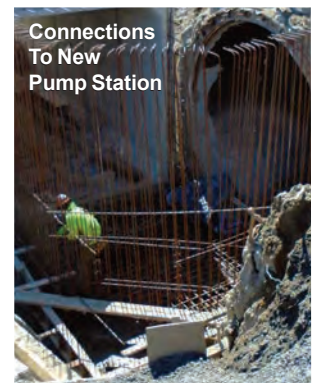
Now and for the foreseeable future, MWRA will continue to focus on ensuring redundancy for each water service area. That means providing a second means of getting water to an area if something happens to the primary pipeline – like a major water main break.

Progress has been steady and work is underway to the north in Stoneham, Reading and Woburn, and to the south in Boston and Dedham to provide redundancy for those areas. A new, emergency pump station in Marlborough will ensure we can get adequate water to the treatment plant in the event of a problem with the existing system.

MWRA is also beginning work to strengthen the major pipelines and tunnels serving large parts of the system. A project to repair and improve the 11-mile-long Weston Aqueduct Supply Main No. 3 is currently in design. This work will take place in Weston, Waltham, Belmont, Arlington and Medford, and must be completed before a new, major tunnel project to the north and south can begin.

**On Going Pipeline Rehabilitation**

MWRA continues to rehabilitate and replace older pipelines throughout the distribution system to improve both reliability and water quality. MWRA has also provided zero-interest loans to communities for local pipeline projects since 1998. In 2017, \$25.8 million was loaned to communities for 18 projects including the replacement of over 15.4 miles of older, unlined pipes with new cement-lined ductile iron water pipes or rehabilitation with cleaning and new cement lining.



**Always Use Water Wisely**

We know that conservation works. Customers in the MWRA service area have reduced their average daily demand from 340 million gallons per day in 1980 to less than 200 million gallons today. It is important that these conservation efforts continue – especially during dry periods.

**WATER SAVING TIPS FOR YOUR HOME**

**Indoors**

- Install low-flow aerators on your faucets. You'll save 1 to 5 gallons per minute.
- Fix that leaky faucet. Worn-out washers can waste hundreds of gallons per week.
- Replace your washing machine with a high-efficiency model. You'll use 30 to 50% less water.
- Fix that leaky toilet. You'll save 50 gallons a day or more.



**Outdoors**

- Water your lawn overnight or before 5:00 a.m. If you water at mid-day, it will evaporate.
- One inch of water a week is plenty. After heavy rains, you may not need to water for 10 to 14 days.
- Use mulch in your flower beds. Mulch will keep roots cool and moist, and reduce weeds.



More tips are available at [MWRA.com](http://MWRA.com).

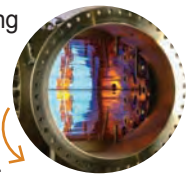
**Monitoring Water Quality In Real Time.** Your water is monitored by a state-of-the-art system in real time – 24 hours a day, seven days a week – to make sure it is free of contaminants. This allows MWRA to respond to changes in water quality almost immediately.



Quabbin Reservoir Overlook

**Why Your Water Tastes Great – Water Treatment**

Massachusetts Water Resources Authority has invested in state-of-the-art treatment to make sure your water is clean, fresh, and tastes great. Part of the reason that the water tastes so good is MWRA's advanced treatment at the John J. Carroll Water Treatment Plant in Marlborough. Since 2005, your water has been treated with ozone - produced by pure oxygen. Ozone has ensured strong protection against microbes and viruses, improved water clarity, and makes the water taste better. In 2014, we also started adding ultraviolet (UV) disinfection, further improving the quality of water.



Ultraviolet (UV) Lamp

UV light is essentially a more potent form of the natural disinfection from sunlight, and ensures that any pathogens potentially in our reservoirs are rendered harmless.

In addition, fluoride is added to promote dental health, and the water chemistry is adjusted to reduce corrosion of home plumbing. Last, we add mono-chloramine, a mild and long-lasting disinfectant combining chlorine and ammonia to protect the water as it travels through miles of pipelines to your home.

**Testing Your Water – Every Step of the Way**

Test results show few contaminants are found in the reservoir water. The few that are found are in very small amounts, well below EPA's standards.

Turbidity (or cloudiness of the water) is one measure of overall water quality. All water must be below 5 NTU (Nephelometric Turbidity Units), and water can only be above 1 NTU if it does not interfere with effective disinfection. In 2017, turbidity was always below both the 5 and 1 NTU standards, with the highest level at 0.92 NTU. Typical levels at the Wachusett Reservoir are 0.35 NTU.

MWRA also tests reservoir water for pathogens such as fecal coliform, bacteria, and the parasites *Cryptosporidium* and *Giardia*. They can enter the water from animal or human waste. All test results were well within state and federal testing and treatment standards. For more information, please visit [www.mwra.com/ucmr/2017.html](http://www.mwra.com/ucmr/2017.html).

**Test Results – After Treatment**

EPA and state regulations require many water quality tests after treatment to check the water you are drinking. MWRA conducts hundreds of thousands of tests per year on over 120 contaminants (a complete list is available on [www.mwra.com](http://www.mwra.com)). Details about 2017 test results are in the table below. The bottom line is the water quality is excellent.



**Facts About Sodium**

Sodium in water contributes only a small fraction of a person's overall sodium intake (less than 5%). MWRA tests for sodium monthly and the highest level found was 38.8 mg/L (about 8 mg per 8 oz. glass). This would be considered **VERY LOW SODIUM** by the Food and Drug Administration.

**TEST RESULTS AFTER TREATMENT**

COMPOUND	UNITS	(MCL) HIGHEST LEVEL ALLOWED	(WE FOUND) DETECTED LEVEL-AVERAGE	RANGE OF DETECTIONS	(MCLG) IDEAL GOAL	VIOLATION	HOW IT GETS IN THE WATER
Barium	ppm	2	0.009	0.007-0.01	2	No	Common mineral in nature
Mono-Chloramine	ppm	4-MRDL	2.14	0-3.85	4-MRDLG	No	Water disinfectant
Fluoride	ppm	4	0.70	0.31-0.78	4	No	Additive for dental health
Nitrate <sup>^</sup>	ppm	10	0.05	0.04-0.05	10	No	Atmospheric deposition
Nitrite <sup>^</sup>	ppm	1	0.006	ND-0.006	1	No	Byproduct of water disinfection
Total Trihalomethanes	ppb	80	15	4.2-25.2	ns	No	Byproduct of water disinfection
Haloacetic Acids-5	ppb	60	12.8	1.5-24	ns	No	Byproduct of water disinfection
Total Coliform	%	5%	0.8% (Aug)	ND-0.8%	0	No	Naturally present in environment
Combined Radium*	pCi/L	5	1.76	ND-1.76	0	No	Erosion of natural mineral deposits

**KEY:** MCL=Maximum Contaminant Level. The highest level of a contaminant allowed in water. MCLs are set as close to the MCLGs as feasible using the best available technology. MCLG=Maximum Contaminant Level Goal. The level of 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 health risk. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contamination. ppm=parts per million ppb=parts per billion ns=no standard ND=non detect <sup>^</sup>=As required by DEP, the maximum result is reported for nitrate and nitrite, not the average. \*Result from 2014

**What You Need To Know About Lead In Tap Water.** MWRA water is lead-free when it leaves the reservoirs. MWRA and local pipes that carry the water to your community are made mostly of iron and steel and do not add lead to the water.

Did You Know?

Most cases of lead poisoning are from contact with peeling lead paint and paint dust. But drinking water exposed to lead can increase a person's total lead exposure. This is particularly a concern for small children and pregnant women. However, lead can get into tap water through pipes in your home, your service line if it is made of lead, lead solder used in plumbing, and some brass fixtures. Corrosion or wearing away of lead-based materials can add lead to tap water, especially if water sits for a long time in the pipes before it is used.



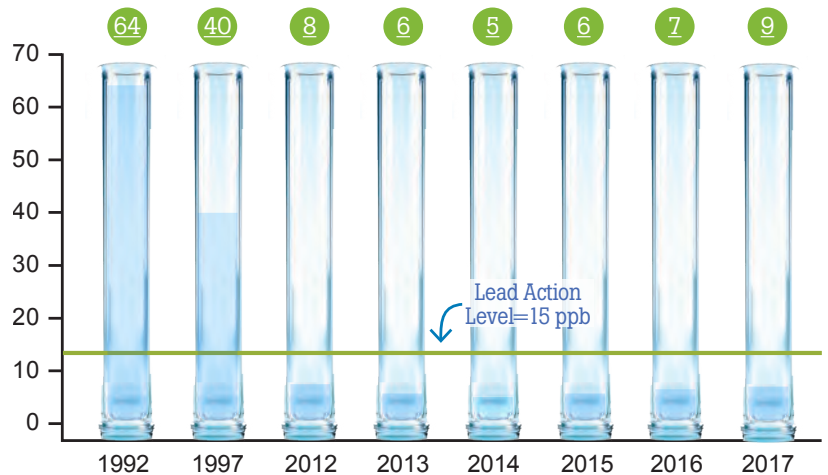
In 1996, MWRA began adding sodium carbonate and carbon dioxide to adjust the water's pH and buffering capacity. This change has made the water less corrosive, thereby reducing the leaching of lead into drinking water. Lead levels found in sample tests of tap water have dropped by about 90 percent since this treatment change.

MWRA Meets Lead Standards In 2017

Under EPA rules, each year MWRA and your local water department must test tap water in a sample of homes that are likely to have high lead levels. These are usually homes with lead service lines or lead solder. The EPA rule requires that 9 out of 10, or 90%, of the sampled homes must have lead levels below the Action Level of 15 parts per billion (ppb).

All 22 sampling rounds over the past thirteen years have been below the EPA standard. Of the 2,300 samples taken in the last 5 years, 98% were below the 15 ppb level. Results for the 456 samples taken in September 2017 are shown in the table. 9 out of 10 houses were below 8.6 ppb, which is below the Action Level of 15 ppb. Four communities: Medford, Melrose, Quincy and Winthrop were individually above the Action Level for lead. Your community letter on page 7 will provide you with local results and more information.

**90% LEAD LEVELS IN MWRA SYSTEM OF FULLY SERVED COMMUNITIES**



**SEPTEMBER 2017 LEAD & COPPER RESULTS**

	Range	90% Value	(Target) Action Level	(Ideal Goal) MCLG	#Homes Above AL / #Homes Tested
Lead (ppb)	0-102	8.6	15	0	18/456
Copper (ppm)	0-0.375	0.103	1.3	1.3	0/456

**KEY:** AL=Action Level-The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. Definition of **MCLG** available on page 3.

**WHAT CAN I DO TO REDUCE MY EXPOSURE TO LEAD IN DRINKING WATER?**



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Let the water run before using: fresh water is better than stale! To save water, fill a pitcher with fresh water and place in the refrigerator for future use.
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Any time water has gone unused for more than 6 hours, run each faucet used for drinking or cooking until after the water becomes cold.
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Never use hot water from the faucet for drinking or cooking, especially when making baby formula or other food for infants.
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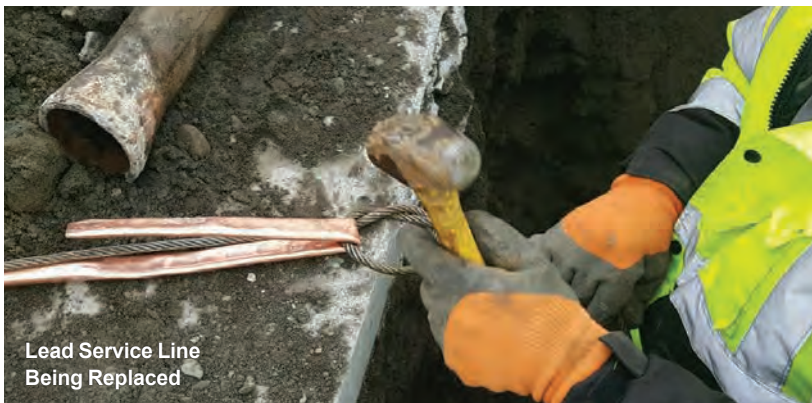
Check your plumbing fixtures to see if they are lead-free. Read the labels closely.
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Remove loose lead solder and debris. Every few months remove the aerator from each faucet in your home and flush the pipes for 3-5 minutes.
- 

Be careful of places you may find lead in or near your home. Paint, soil, dust and some pottery may contain lead.
- 

Call the Department of Public Health at 800-532-9571 or EPA at 800-424-LEAD for health information.

**MWRA Wins “Systems Taking Action to Reduce Lead” Award.** MA DEP has recognized the effort that the MWRA has demonstrated to educate and work with the schools in all MWRA communities. By providing free testing of schools, MWRA is helping to ensure that children are not exposed to the dangers of lead.



Lead Service Line Being Replaced

### What Is A Lead Service Line? What Is The Concern?

A service line is the pipe that connects your house to the water main in the street. Some service lines that run from older homes (constructed before 1940) are made from lead. Many of these older service lines have been replaced, but some remain. These service lines are the main source of lead to tap water in homes that have them. Therefore, removing lead service lines is a priority to reduce the potential for lead exposure, particularly if a pregnant woman or child lives at your home.

### How Do I Replace My Lead Service Line?

If you have a lead service line, you should consider replacing it. Many communities have programs to help with the replacement cost. Removing the whole lead service line is important. It is the only way to ensure that your service line will not be adding lead to your water. Partial replacements - which leave some lead behind - do not lower lead levels, and in many cases, can actually increase lead levels.

### Important Information From EPA About Lead

If present, elevated levels of lead can cause serious health problems, especially for unborn babies and young children.

Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. MWRA is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components.

If your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap water 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 at 1-800-426-4791 or [www.epa.gov/safewater/lead](http://www.epa.gov/safewater/lead).

### MWRA Program To Replace Lead Service Lines

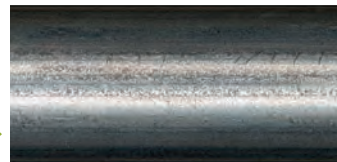
To help communities in removing lead service lines, MWRA and its Advisory Board approved a program to make available \$100 million in zero-interest loans to its member communities to fully replace lead service lines. Each community can develop its own program, tailored to their local circumstances. Several communities have already moved forward with programs. To find out more, please read your community letter or contact your local water department.

### How Do I Get My Homes’s Tap Water Tested For Lead?

There is a list of labs and sampling instructions available on the lead testing page at [www.mwra.com](http://www.mwra.com) or you can call MWRA at 617-242-5323. Also, some communities have testing available for residents. Please contact your local water department for more information.

### What’s My Service Line?

You can identify a lead service line by carefully scratching it with a key. →

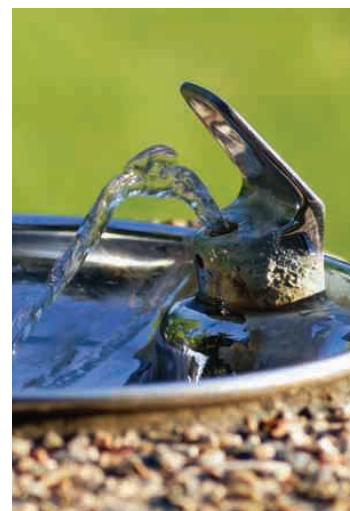


← Have it replaced with a new copper service line.

For more information on lead service lines go to [mwra.com](http://mwra.com).

### LEAD TESTING IN SCHOOLS

Starting in 2016, MWRA in coordination with DEP, provided no-cost lab analysis and technical assistance for schools and day care centers across all of MWRA’s water communities. Almost all MWRA communities have already participated in the program, and sampling is still ongoing. Nearly 17,000 samples from 313 schools across 35 communities were received, and over 29,000 tests were completed. Results are available on the DEP website – [www.mass.gov/dep](http://www.mass.gov/dep) (search for lead in schools). Some results also may be available through your local community website, DPW, or school department.



**MWRA Takes Customer Concerns Seriously.** Every call is investigated to ensure that there are no problems with the water supply. Most complaints are related to discolored water, which is usually related to local construction or hydrant use. If you have a question or concern, please call your local water department or MWRA at 617-242-5323.



### Tests In Community Pipes

MWRA and local water departments test 300 to 500 water samples each week for total coliform bacteria. Total coliform bacteria can come from the intestines of warm-blooded animals, or can be found in soil, plants, or other places. Most of the time, they are not harmful. However, their presence could signal that harmful bacteria from fecal waste may be there as well. If total coliform is detected in more than 5% of samples in a month, the water system is required to investigate the possible source and fix any identified problems. If a water sample does test positive, we run more specific tests for *E. coli*, which is a bacteria found in human and animal fecal waste and may cause illness. If your community found any total coliform or *E. coli*, it will be listed within the community letter on page 7.

### Drinking Water And People With Weakened Immune Systems

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/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the EPA's Safe Drinking Water Hotline (1-800-426-4791).

### Contaminants In Bottled Water And Tap Water

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 EPA's Safe Drinking Water Hotline (1-800-426-4791) or MWRA. In order to ensure that tap water is safe to drink, Massachusetts DEP and EPA prescribe regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) and the Massachusetts Department of Public Health regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

### Research For New Regulations

MWRA has been working with EPA and other researchers to define new national drinking water standards by testing for unregulated contaminants. To read more about these regulations, and to see a listing of what was found in MWRA water, please visit [www.mwra.com/UCMR/2017.htm](http://www.mwra.com/UCMR/2017.htm).

**WATERSHED PROTECTION** keeps the water supply clean and safe while providing open space. All of the trees and protected land in the Quabbin, Wachusett and Ware River watersheds act as extra layers of protection from possible contamination. The protected land acts as a natural filter, and is one of the reasons MWRA water is often rated as among the best in the country. Since 1985, almost \$150 million has been invested in land protection.



Wachusett Reservoir Overlook



Massachusetts DEP recommends the installation of backflow prevention devices for inside and outside hose connections to help protect the water in your home as well as the drinking water system in your town.

For more information on cross connections, please call 617-242-5323 or visit [mwra.com/crosscon](http://mwra.com/crosscon).



## TOWN OF NORWOOD

Public Water Supply  
# 4220000

To the Norwood Community:

This annual report, compiled in accordance with state and federal drinking water regulations, deals with the quality of the drinking water that we deliver to you, our residents, and other water users.

Norwood, like many other communities in the metropolitan area, obtains all of its water from the Massachusetts Water Resources Authority (MWRA), which owns and operates a network of water reservoirs, treatment facilities and distribution pipes, ranging from the Quabbin and Wachusett reservoirs and storage facilities in western and central Massachusetts to the hundreds of miles of individual water mains that deliver water to our border. The Town, in turn, delivers this water to your home through a network of over 120 miles of locally-owned distribution pipes, maintained by our local Department of Public Works.

Both the MWRA and the Town have invested heavily in our water systems in recent years in order to maintain the high quality of our drinking water. In the last few years, for example, we have cleaned and lined several thousand feet of water main to eliminate rusty water problems and to improve fire flows in different neighborhoods. Last year's project cleaned and cement-lined a total of 1,100 feet of 6-inch water main on Nichols Street (Vernon St. to Nahatan St.) and 1,600 feet of 6-inch water main on Cottage Street (Prospect St. to Maple St.).

This coming construction season, we will continue our focus on improving water quality by cleaning and lining water mains as well as replacing unlined water mains. This year's projects will clean and cement-line a total of 4,040 feet of 6-inch water main on Cottage Street (Maple St. to Washington St.), Vernon Street (Nichols St. to Washington St.), Day Street (Beech St. to Washington St.), Maple Street (Cottage St. to Nichols St.), and Wheelock Avenue. In addition, the Town will replace 2,300 feet of 8-inch unlined water main between #100 Access Road and #236 Access Road. Work on these projects will commence in mid-to-late summer.

### Water Quality Results

The MWRA water that is supplied to Norwood is some of the highest quality water in the country. Both the MWRA and the Town constantly collect and analyze water samples in accordance with protocols set by state agencies and by the EPA to ensure its continued safety and potability.

The most frequently asked question that we receive about water quality concerns the potential presence of lead in tap water. The answer is simple: the water we supply to your home does not contain any lead. If any lead is present at the tap, it has been picked up through contact with brass fixtures (which contain lead in the alloy) or with lead elsewhere on the premises, such as lead solder used in plumbing work. Lead water services (the pipe running from the house foundation to the water main in the street) may also be a factor. However, lead has not been used for water services or for household plumbing since before World War II. Although the majority of homes dating from this earlier era either never used lead or have since had their water services replaced, there are still a small number of lead services in use. Over the last several years, the Public Works Department has located and replaced over 120 such residential services, even though almost none of the homes involved exhibited elevated lead levels. Lead solder, on the other hand, was not banned until 1986, so it is possible that some newer homes built before that date could have elevated levels of lead present in the "first flush" from a tap. However, if you think that your house may have a lead water service, please call the Public Works Department at 781-762-1413 to schedule an inspection, or email us at [mryan@norwoodma.gov](mailto:mryan@norwoodma.gov).

Each year, Norwood samples 15 homes for lead. The 90th percentile for Norwood was 10.6 ppb which is below the Action Level of 15 ppb. One of the 15 homes was above the Action Level. The last time Norwood had a sample over the Action Level was 2012. For more information about the potential presence of lead at the tap and steps that may be taken to reduce exposure, contact the Norwood Board of Health. In addition, the Board of Health conducts a voluntary lead testing program using a state-certified laboratory to analyze tap water samples collected by the consumer (there is a \$25 fee). Please contact Director of Public Health Sigalle Reiss in the Health Dept. at 781-762-1240 x174 for more information.

Norwood also collects water samples for total coliform bacteria throughout the distribution system. The EPA requires that no more than 5% of the samples each month may be positive. Norwood had two positive samples in February and June (2.8%) which was below the EPA standard. All other samples were clear.

We hope that you find this report to be informative. If you have any questions, please contact Mark P. Ryan, Director of the Department of Public Works at 781-762-1413.

Tony Mazzucco  
General Manager

Mark P. Ryan  
Director of Public Works and Town Engineer