Always Monitoring Your Water, Reservoir to Residence

Massachusetts Water Resources Authority
And Your Local Water Department

Where To Go For Further Information
Massachusetts Water Resources Authority (MWRA) www.mwra.com 617-242-5323
Department of Conservation and Recreation (DCR) www.mass.gov/dcr/watersupply 617-626-1250
www.mass.gov/dph 617-624-6000
US Centers for Disease Control & Prevention (CDC) www.cdc.gov 800-232-4636
Source Water Assessment and Protection Reports www.mwra.com/sourcewater.html 617-242-5323

Public Meetings
MWRA Board of Directors www.mwra.com/boardofdirectors.html 617-788-1117
MWRA Advisory Board www.mwraadvisoryboard.com 617-788-2050
Water Supply Citizens Advisory Committee www.mwra.com/wscac.html 413-213-0454

For A Larger Print Version, Call 617-242-5323.
This report is required under the Federal Safe Drinking Water Act. MWRA PWS ID# 6000000
Dear Customer,

I am happy to provide you with the results of our annual drinking water testing for 2021. Once again, every federal and state standard was met and the quality of your drinking water is excellent.

I also want to assure you that we are constantly checking your water. We have a state-of-the-art monitoring system from the treatment plant to your local pipes, and we take hundreds of thousands of tests each year to ensure that your water is safe. We are also closely watching other important issues that could affect our water, from climate change to cybersecurity. You can be sure that the safety of your drinking water is the top priority for the women and men of the MWRA.

We continue to take aggressive actions to reduce the risk of lead in drinking water. Since 2016, we have provided $30 million in zero-interest loans to 13 communities for full lead service line removals. System-wide, we remain below the Lead Action Level. Please read your community’s letter on page 7 for more information on your local water system.

PFAS - or ‘forever chemicals’ – remain a top news story. Since our source water is so well protected, our water easily meets the Massachusetts Department of Environmental Protection’s standards.

Last year, we welcomed two new communities to our water system: Ashland and Burlington. Our reservoirs have ample supplies to meet the needs of our service area; but, it is important that we all conserve water wherever possible. This is our most precious resource and we cannot afford to waste it.

I hope you will take a moment to read this report. We have great confidence in the water we deliver to your homes and businesses, and we want you to as well. 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
While the pandemic continued to impact health and supply lines in 2021, MWRA’s drinking water continued to meet all federal and state standards. MWRA staff carried out ongoing, uninterrupted treatment, sampling, testing, planning, and monitoring to ensure the continuous delivery of pure drinking water to all our customers. This annual water quality report illustrates MWRA’s ongoing efforts to ensure the provision of your water under all conditions.

The Quabbin and Wachusett watersheds—areas that drain water to the reservoirs—are naturally protected. More than 85% of the watersheds are covered with forests and wetlands, which filter the rain and snow that enters the 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. This process helps to clean the water, but it also can dissolve and carry very small amounts of material into the reservoir. Minerals and rock do not typically cause problems in the water. Water can also transport contaminants, including bacteria, viruses or other potential pathogens, from human and animal activity, that can cause illness. Testing results show few contaminants are found in the reservoir water. The few that are detected are in very small amounts that are well below EPA’s standards.

MWRA and DCR maintain a nationally recognized watershed protection program. The Department of Environmental Protection’s (DEP) Source Water Assessment report for the Quabbin and Wachusett Reservoirs commended DCR and MWRA for our source water protection plans. The report states that our “watershed protection programs are very successful and greatly reduce the actual risk of contamination.” MWRA and DCR follow the report recommendations to maintain the pristine watershed areas. For more information on our source water, go to: www.mwra.com/sourcewater.html.

MWRA analyzes, treats and protects the quality of your water from its source to your home or business, starting with the watershed streams, to hundreds of miles of MWRA pipes and thousands of miles of local pipes, all the way to your home. MWRA testing shows that few contaminants are found in the water from our reservoirs. All were well below EPA’s standards in 2021.

A key, initial test for reservoir water quality is turbidity, or cloudiness. Turbidity refers to the amount of suspended particles in the water and can impair water disinfection. 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 2021, typical levels in the Wachusett Reservoir were 0.29 NTU, with the highest level of turbidity at 0.61 NTU, well below the standard.

MWRA also tests water for potential disease-causing organisms, including local coliform bacteria, and parasites such as Giardia and Cryptosporidium, that can enter the water from animal or human waste. All test results for the reservoir water were well within state and federal testing and treatment standards.

Learn more about MWRA testing for waterborne contaminants and their potential health impacts on our website at: www.mwra.com.

MWRA Water Test Results 2021
EPA requires that MWRA test for over 120 contaminants that may be in drinking water. MWRA found only those listed here. All of these levels were below EPA’s Maximum Contaminant Levels (MCL).

<table>
<thead>
<tr>
<th>Compound</th>
<th>Units</th>
<th>(MCL) Highest Level Allowed</th>
<th>(We Found) Detected Level-Average</th>
<th>Range of Detections</th>
<th>(MCLG) Ideal goal</th>
<th>Violation</th>
<th>How It Gets in the Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barium</td>
<td>ppm</td>
<td>2</td>
<td>0.009</td>
<td>0.008 - 0.01</td>
<td>2</td>
<td>No</td>
<td>Common mineral in nature</td>
</tr>
<tr>
<td>Monochloramine</td>
<td>ppm</td>
<td>4-MRDL</td>
<td>1.99</td>
<td>0 - 4.0</td>
<td>4-MRDLG</td>
<td>No</td>
<td>Water disinfectant</td>
</tr>
<tr>
<td>Fluoride</td>
<td>ppm</td>
<td>4</td>
<td>0.71</td>
<td>0.24 – 0.81</td>
<td>4</td>
<td>No</td>
<td>Additive for dental health</td>
</tr>
<tr>
<td>Nitrate^</td>
<td>ppm</td>
<td>10</td>
<td>0.83</td>
<td>0.05 – 0.83</td>
<td>10</td>
<td>No</td>
<td>Atmospheric deposition</td>
</tr>
<tr>
<td>Total Trihalomethanes</td>
<td>ppm</td>
<td>80</td>
<td>18.6</td>
<td>6 – 34.8</td>
<td>NS</td>
<td>No</td>
<td>Byproduct of water disinfection</td>
</tr>
<tr>
<td>Haloacetic Acids - 5</td>
<td>ppb</td>
<td>60</td>
<td>16.8</td>
<td>3.7 – 30.2</td>
<td>NS</td>
<td>No</td>
<td>Byproduct of water disinfection</td>
</tr>
</tbody>
</table>

**KEY:** MCL = Maximum Contaminant Level. The highest level of a contaminant allowed in water. MCLGs 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 ^ = As required by DEP, the maximum result is reported for nitrate.
Treating Your Water
Downstream of the reservoirs, MWRA’s John J. Carroll Water Treatment Plant in Marlborough provides state-of-the-art treatment and monitoring of your water. Our well trained and licensed operators add measured doses of treatment chemicals.

- Ozone, made from pure oxygen, disinfects the water, killing bacteria, viruses and other organisms, and improves water clarity and taste.
- Ultraviolet light (UV), a more powerful form of natural disinfection than sunlight, renders pathogens non-infectious.
- Fluoride protects dental health.
- The water chemistry is adjusted to reduce corrosion of lead from home plumbing.
- Monochloramine (a compound of chlorine and ammonia), provides a mild and long-lasting disinfectant to protect the water as it travels through miles of pipelines to your home.

Water Monitoring After Treatment
EPA and state regulations require regular monitoring of water quality tests to evaluate the water you drink. MWRA conducts hundreds of thousands of tests per year on over 120 contaminants. A complete list is available on www.mwra.com. The results of MWRA’s water quality tests in 2021 are shown in the table on page 2. They confirm the quality and safety of the water your community receives from MWRA.

Continuous Service + Redundancy = Reliability
Maintaining system redundancy allows us to continue uninterrupted water delivery to your community, even if sections of our system need inspection, repair or rehabilitation. Planning and environmental review for two new tunnels north and south of Boston to provide reliable service to the entire region is well underway. We also have major projects underway to rehabilitate the Weston Aqueduct Supply Main 3, a 60-inch pipe in Weston, Waltham, Belmont, Arlington and Medford, as well as a 48-inch pipe in Stoneham and Woburn. See www.mwra.com for more info.

MWRA provides zero–interest loans to communities for pipeline rehabilitation and other water quality improvements. During 2021, we loaned $28 million to 18 communities for pipeline projects and $11 million to 8 communities for lead service line replacements.

Sodium and Drinking Water
MWRA tests for sodium monthly, and the highest level was 39.3 mg/L (about 10 mg per 8 oz. glass). This level would be considered to be Very Low Sodium by the Food and Drug Administration (FDA). Sodium in drinking water contributes only a small fraction of a person’s overall sodium intake (less than 5%).

Conservation, Climate Change, and Your Reservoirs
MWRA works with the communities we serve to promote water conservation. Efficient and wise use of our water keeps it available for the future. We monitor stream flow, reservoir levels and climate forecasts to ensure reliable supply under all conditions, including droughts and major storms. The engineers and planners who designed our supply left us a robust, reliable, system for the future.

Monitoring All Day, Every Day
MWRA’s monitoring systems are in operation continuously, 24/7/365. The systems help us evaluate your water before and after treatment. They also help us determine if the water is free of contaminants, and to respond rapidly to changes or issues related to water quality.
The Facts on Lead

Lead can be found in your home, including plumbing and your drinking water. Learn about the health impacts of lead, and how to reduce exposure to this toxic metal on the following pages.

How Lead Affects Health and Development

Lead affects young children, and may cause damage to the brain, slow growth and development, and learning and behavior problems. Preventing lead exposure is particularly important if a pregnant woman or a child lives in your home or apartment. Lead can also impact the health of your entire family. While lead poisoning frequently comes from exposure to lead paint dust or chips, lead in drinking water can also contribute to chronic, total lead exposure.

Important Lead Information From EPA

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water comes 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 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.

How Lead Can Enter Your Water

Lead in your home plumbing or a lead service line can contribute to elevated lead levels in the water you drink. MWRA’s water is lead-free when it leaves our reservoirs. Distribution pipes that carry the water to your community are made mostly of iron and steel, and do not add lead to the water. Lead can enter your tap water from your service line (the line that connects your home to the water main) if it is made of lead, lead solder used in plumbing, or from some older faucets.

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. MWRA’s corrosion control program helps limit the amount of lead in your water. In 1996, MWRA began adding sodium carbonate and carbon dioxide to adjust the water’s pH and buffering capacity. This treatment makes the water less corrosive and reduces leaching of lead into drinking water. Lead levels found in sample tests of tap water have dropped by nearly 90% since this treatment change. Learn more about lead in drinking water at www.mwra.com.

MWRA Meets Lead Standard in 2021

Under EPA/DEP rules, MWRA and your local water department are required to test tap water each year. We collect samples from homes with lead service lines or lead solder. The EPA rule requires that 9 out of 10 homes tested must have lead levels below the Action Level of 15 parts per billion (ppb).

This testing process can provide information on whether lead is corroding and mixing with the drinking water. It also provides communities and homeowners with information on how to reduce lead in their drinking water. The results do not reflect lead levels in all homes.

All sampling rounds over the past 18 years have been below the EPA Action Level. Nine out of ten homes were below 8.56 ppb — well below the Action Level.

Five communities — Boston, Malden, Medford, Melrose and Winthrop — were above the lead Action Level in September 2021. Your community letter on Page 7 will provide you with local results and more information.

What is An Action Level?

An Action Level is the amount of lead that requires action to reduce exposure. If your home or school’s drinking water is above the lead Action Level, additional steps to reduce lead may be required. If more than 10% of your community’s samples were over the lead Action Level, your local water department is taking action to address the problem. See page 7.
Keep Lead Out of Your Drinking Water

Lead Service Lines
A service line connects your home or building to the water main in the street. If yours is made of lead, it can be the main source of lead in your tap water. Older pipes that combined galvanized iron and lead connectors ("goosenecks") can also release lead. Lead service lines should be removed entirely to prevent lead in your drinking water.

Replacing Lead Service Lines
Your local water department can help find out if you have a lead service line, and provide help in replacing it. In some cases, an onsite check is necessary to determine the specific piping to your building.

You can also see if your service line is made of lead by scratching the pipe near your water meter with a key or other metal object. Lead pipes will show a dull grey color, while copper pipes will not. For an online how-to guide, go to www.epa.gov/pyt.

MWRA Funding to Replace Lead Service Lines
MWRA and its Advisory Board offer zero-interest loans to customer communities for full lead service line replacement projects. Each MWRA community can develop its own local plan, and many communities have already taken steps to remove lead service lines. To find out more, contact your local water department.

How to Test Your Drinking Water
If you are concerned about lead piping in your home, contact your local water department about testing for lead in your drinking water. MWRA also maintains a list of certified laboratories and sampling instructions on our website at www.mwra.com. You may also call MWRA at 617-242-5323.

Lead Testing in Schools
Children can consume most of their drinking water at school or daycare. The plumbing inside some schools and childcare facilities can contain lead and contribute to lead exposure. MWRA, in coordination with DEP, provides no-cost lab analysis and technical assistance for schools and day care centers in MWRA communities. This service has been offered since 2016, and nearly all MWRA communities have participated. To date, more than 39,000 tests have been completed in more than 530 schools. Results are available on the MassDEP website at: www.mass.gov/dep (search for “lead in schools”). You may also contact your local school or water department for results.

Reduce Your Exposure to Lead

Remove Lead Piping
• Find out if you have a lead service line or lead components in your plumbing. Learn about options for removal of this piping from your local water department.

Other Measures for Lead Reduction
• Any time water has not been used for more than 6 hours, run the faucet used for drinking water or cooking until after the water becomes cold.
• Let water run before using it—fresh water is better than stale. To save water, fill a pitcher with fresh water and place it in the refrigerator for future use.
• Never use hot water from the faucet for drinking or cooking, especially when making baby formula or other food for infants or young children.
• Remove loose lead solder and debris. Every few months, remove the aerator from each faucet and flush the pipes for 3 to 5 minutes.
• Be careful of places where you may find lead in or near your home. Paint, soil, dust and pottery may contain lead. Call the Massachusetts Department of Public Health at 1-800-532-9571 or 1-800-424-LEAD for information on lead and health impacts.

3 Ways to reduce lead in your water
• Remove your lead service line
• Run your water before using
• Use a filter certified to remove lead

Water Service Lines — Lead and Copper

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

New copper service line.
MWRA works with local water departments to sample and test 300-500 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 a more specific test for E. coli, which is a bacteria found in human and animal fecal waste and may cause illness. If your community was required to do an investigation, or found E. coli, it will be in the letter from your community on page 7.

Important Research for New Regulations
MWRA works with EPA and health research organizations to help define new national drinking water standards by collecting data on water contaminants that are not yet regulated. Very few of these potential contaminants are found in MWRA water due to our source water protection efforts. Information on this testing, as well as data on PFAS, disinfection by-products, Giardia and Cryptosporidium, and other contaminants can be found at www.mwra.com.

MWRA Monitoring for PFAS
PFAS compounds, used since the 1950s for many purposes from stain and water proofing to firefighting, continue to be a concern. In 2020, MassDEP published a drinking water standard for PFAS. MWRA water is now tested for 6 different PFAS compounds or “PFAS6.” Tests of MWRA water show only trace amounts of these compounds, well below the state standard of 20 parts per trillion. See www.mwra.com.

Important Health Information:
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).

Complaints Are Important!
You can help provide information about local water quality. Every call is investigated. Most complaints are related to discolored water (usually related to local construction or hydrant use), or conditions in a building’s plumbing. Contact your local water department, or call MWRA at (617) 242-5323.

Cross-Connection Information
A cross-connection is any temporary or permanent connection between a potable (drinking) water source and a non-potable source. Non-potable water or other sources can contaminate your drinking water if backflow occurs.

Sources could include:
• Garden hoses
• Boilers
• Swimming pools
• Irrigation systems or wells
• Residential fire protection systems

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 www.mwra.com.

EPA Information on 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, the Massachusetts DEP and the EPA prescribe regulations which limit the amount of certain contaminants in water provided by public water systems. The U.S. Food and Drug Administration (FDA) and the Massachusetts Department of Public Health (MDPH) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

Continue to Conserve
MWRA water use has dropped by over a third since the 1980s. It’s up to all of us to continue to use water wisely. Every drop is valuable. Our website has many tips on how to save water indoors and outside.
Dear Customer:

This report contains an annual update on the quality of drinking water supplied to you by the Boston Water and Sewer Commission (BWSC), in partnership with the Massachusetts Water Resources Authority (MWRA). Inside this report, there is detailed information on the MWRA’s system, and how the water delivered to Boston complies with federal and state quality standards.

BWSC continues to provide excellent drinking water to our customers through the investment of millions of dollars in upgrades to our infrastructure. The water provided by BWSC from the MWRA is lead-free when it leaves the reservoirs. The majority of distribution pipes that carry water to homes are made of iron and steel. We care about lead because infants and children who drink water containing lead could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink this water over many years could develop kidney problems or high blood pressure.

The Commission entered into an Administrative Consent Order with MassDEP on October 5, 2021, to remove lead services from both private property and the public way. In our 2021 sampling of higher risk homes, BWSC lead results were 17.4 parts per billion (ppb), with samples from 4 homes above the Lead Action level of 15 ppb while our copper results of 117 ppb were well below the Action Level of 1300 ppb. BWSC initiated a program under which customers can call our Lead Hotline to schedule an inspection, thus providing BWSC the ability to access private properties to inspect the water service pipes to determine whether they are composed of lead. In 2021, BWSC received over 1,100 customer requests to have their water service pipe inspected for lead, resulting in 445 lead replacements. BWSC offers a Lead Replacement Incentive Program which offers up to $4000 to qualified homeowners to remove private lead pipes. For additional information call the lead hotline at (617) 989-7888.

In the Spring of 2022, Boston was required to carry out an additional round of lead sampling. The 90th percentile was 9.76 ppb, well below the lead Action Level.

Following routine water sampling in October 2021, BWSC found coliforms indicating the need to look for potential problems in water treatment or distribution. Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present, or a potential pathway that may allow contamination to enter the drinking water distribution system. We were required to conduct and complete a Level 1 assessment which is a study of the water system to identify potential problems, and to determine (if possible) why total coliform bacteria have been found. In the October sampling, 280 tests were performed with 16 test results showing Coliforms present. Of the 60 primary sampling sites, 6 primary and 3 secondary sites in the test areas came back with total coliform present. When the testing exceeds the regulated 5% criteria an assessment is required. Based on the assessment findings, we took required actions at these locations by performing extensive flushing of the water system for better circulation which reduces total coliform from forming. The testing in November and December did not exceed the 5% criteria.

Any questions regarding information in this report or commission meetings may be directed to BWSC’s Communications and Community Services Department at (617) 989-7888. Please visit our website www.bwsc.org to learn about the programs we offer.

Sincerely,

[Signature]

Henry F. Vitale, CPA
Executive Director/Treasurer