



# 2021 Annual Water Quality Report

## Methuen Water Department

PWS ID #3181000

### METHUEN WATER DEPARTMENT

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## TO OUR RESIDENTS

Once again we are proud to present our annual water quality report covering the period between January 1 and December 31, 2021. This report summarizes the departments water quality tests for calendar year 2021, and provides information on the source of your drinking water, how it is treated, and other useful information. In 2021, we met every federal and state drinking water standard. Lead found in drinking water is again still a hot topic. Last summer (2021) we conducted our lead and copper testing and results were released in October of 2021. The water department has been continuing to find and replace any remaining lead goosenecks within the system. We have been working closely with our partners at 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 city. More information on lead can be found in this report. Also of importance this year is polyfluoroalkyl substances or more commonly known as PFAS. Per- and polyfluoroalkyl substances (PFAS) are a group of man-made chemicals that includes PFOA, PFOS, GenX, and many other chemicals. For more information about this please see the section in this report on PFAS. The Water Department is dedicated to protecting public health and upholding the public's trust in their drinking water every day. Please contact us if you have any questions or concerns about your water quality. If you would like a printed copy, or if you have any questions or comments regarding our report, please email Melissa Woodbury at [Mwoodbury@ci.methuen.ma.us](mailto:Mwoodbury@ci.methuen.ma.us)



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## IMPORTANT HEALTH INFORMATION

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the **Safe Drinking Water Hotline at (800) 426-4791 or <http://water.epa.gov/drink/hotline>**

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

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

**SECOND BARRIER:** Treatment techniques. Learn about the importance of treatment and how our Treatment Plant operates.

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

**FOURTH BARRIER:** Conservation and responsible water use. Learn what we do to minimize water waste and helpful tips to optimize your water efficiency. You'll also find some potentially eye-opening information about water on the last page of this report.



## WHERE DOES MY WATER COME FROM?

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

## THE TREATMENT PROCESS—SECOND BARRIER

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

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

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

## SUBSTANCES THAT COULD BE IN SOURCE WATER

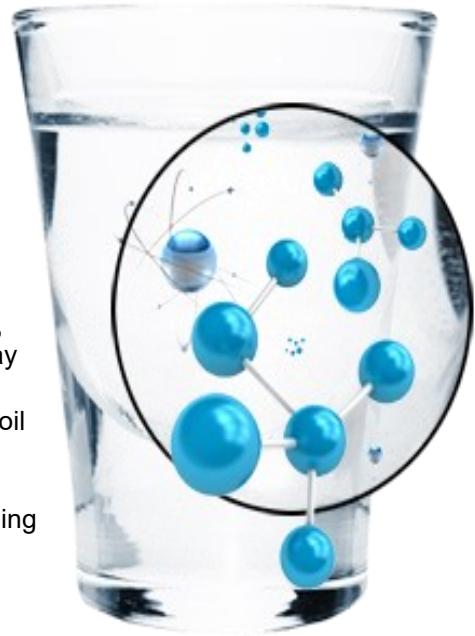
To ensure that tap water is safe to drink, the Department of Environmental Protection (DEP) and the U.S. Environmental Protection Agency (U.S. EPA) prescribe regulations limiting the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) and Massachusetts Department of Public Health (DPH) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of these contaminants does not necessarily indicate that the water poses a health risk.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Substances that may be present in source water include:

- **Microbial Contaminants**, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations or wildlife;
- **Inorganic Contaminants**, such as salts and metals, which can be naturally occurring or may result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming;
- **Pesticides and Herbicides**, which may come from a variety of sources, such as agriculture, urban storm water runoff and residential uses;
- **Organic Chemical Contaminants**, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production and which may also come from gas stations, urban storm water runoff and septic systems;
- **Radioactive Contaminants**, which can be naturally occurring or may be the result of oil and gas production and mining activities.

More information about contaminants and potential health effects can be obtained by calling the

U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.



With the coronavirus (COVID-19) pandemic still impacting communities throughout the world, water professionals are working around the clock to ensure that safe, reliable water service continues to flow. Many of you have concerns and questions about the safety of drinking water during this time. At this time there is no evidence showing anyone has gotten COVID-19 through drinking water, recreational water, or wastewater. The risk of COVID-19 transmission through water is expected to be low. The Methuen Drinking Water and Distribution Divisions understand these concerns and are committed to being responsive to our citizens and community needs. We continuously monitor and test the drinking water throughout the treatment process and in the distribution system to ensure its quality and safety. There is no higher priority for EPA, MassDEP, and more specifically Methuen Water Department personnel than protecting the health and safety of our citizens. According to the U.S. Centers for Disease Control and Prevention (CDC): ***"Conventional water treatment methods that use filtration and disinfection, such as those in most municipal drinking water systems, should remove or inactivate the virus that causes COVID-19."*** As our operators continue to provide water to the community, we will follow the guidance of the American Water Works Association, the CDC, MassDEP, and Mass Department of Public Health to protect our employees from potential exposure and safeguard their ability to operate and maintain our critical water infrastructure and ensure the safe supply of water to your homes, hospitals, restaurants and fire suppression.

## 2021 SAMPLING RESULTS

During the past year, we have taken hundreds of water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic or synthetic organic contaminants. The table below shows only those contaminants that were detected in the water. The state requires us to monitor for certain substances less than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the

### 2021 Water Quality Data from the Methuen Water Department and Distribution System

Parameter (UNIT S)	Date	MCLG	MCL	Amount Detected	Range Low-High	Violation (Y/N)	Typical Source
<b>REGULATED SUBSTANCES</b>							
Perchlorate (ppb)	2021	N/A	2	0.16	0.00-0.19	N	Inorganic chemicals used as oxidizers in solid propellants for rockets, missiles, fireworks, and explosives
Total Organic Carbon (% removal)	2021	N/A	TT=35-45% removal	2.7	<0.500-2.7	N	Naturally present in the environment
Total Coliform	2021	0	>5%	—	—	N	Naturally present in the environment
Chlorite (ppm)	2021	0.8	1	0.29	ND-0.38	N	By-product of drinking water disinfection
Chlorine (ppm)	2021	4	4	0.85	0.62-2.4	N	Water additive used to control microbes
Total Trihalomethanes [TTHMs] (ppb)	2021	N/A	80	42	5.2-51	N	Byproduct of drinking water disinfection
Haloacetic acids [HAA] (ppb)	2021	N/A	60	21	6.6-27	N	Byproduct of drinking water disinfection
PFAS6 (ppt)	2021	0	20	3.6	3.4-3.8	N	See page 8 for more details
Turbidity	TT	Lowest Monthly % of Samples		Highest Daily Value		Violation (Y/N)	Typical Source
Daily Compliance (NTU)	5	—		0.317		N	Soil runoff
Monthly Compliance	At least 95%	99%		—		N	
Parameter (UNITS)	Year	AL	MCLG	Amount Detected (90th %tile)	Sites Above AL/ Total Sites	Violation	Typical Source
Copper (ppm)	2021	1.3	1.3	0.19	0/33	N	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppm)	2021	0.015	0	0.0038	1/33	N	Corrosion of household plumbing systems; Erosion of natural deposits
<b>UNREGULATED or SECONDARY CONTAMINANTS (MCL has not yet been established)</b>							
Parameter (UNITS)	Date	Result or range	SMCL		ORSG or Health Advisory	Typical Source	
Aluminum (ppm)	2021	0-0.02	0.0.200		N/A	Residue from water treatment process; erosion of natural deposits	
pH	2020	6.9-7.6	6.5-8.5		N/A	N/A	
Sodium (ppm)	2021	40	20		N/A	Naturally present in the environment and road salt	
Sulfate (ppm)	2020	18	250		N/A	Natural sources	
Manganese (ppm)	2021	0.009	0.05		N/A	Erosion from natural deposits	
Total Hardness	2021	24	—		N/A		
Total Dissolved Solids	2021	150	500		N/A	Erosion from natural deposits	
Total Alkalinity	2021	18	—		N/A		
Zinc (ppm)	2021	0.14	5		N/A	Corrosion of household plumbing systems; Erosion of natural deposits	

## 2021 Water Quality Data from the Methuen Water Department and Distribution System (continued)

Parameter (Units)	Average	Range of Detection	Possible Source
<b>Other Organic Contaminants - when detected at treatment plant as VOC residuals, not TTHM compliance</b>			
Bromodichloromethane (ppb)	2.5	2.9-17	By-product of drinking water disinfection
Chloroform (ppb)	7.8	1.6-4.1	By-product of drinking water disinfection
Dibromodichloromethane (ppb)	0.6	0-0.6	By-product of drinking water disinfection
Methylene Chloride (ppb)	1.3	0-1.3	

### IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

#### Monitoring Requirements Not Met for Methuen Water Department

In 2021 we became aware that our system failed to meet certain monitoring requirements. We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not our drinking water meets health standards. During 2021 we did not complete all monitoring or testing for contaminants and therefore cannot be sure of the quality of our drinking water during that time. Although these incidents were not an emergency, as our customers, you have a right to know what happened and what we did to correct the situation.

During 2021, we did not complete all monitoring or testing for PFAS6, we were required to take a confirmatory sample within 2 weeks following our initial sampling event and failed to do so. The Methuen WTP has never had a PFAS6 result over the contamination limit.

Also in 2021, we had a failure in turbidity monitoring for an individual filter. We are required to monitor turbidity continuously to ensure the performance of our carbon filters. With one of our analyzers not working properly, turbidity on one of our filters was not continuously monitored. Although one failed, the turbidity in earlier parts of the treatment process were under the MCL.

Lastly, during our lead and copper sampling in Summer of 2021, we are required to submit a 90th percentile report and failed to submit this form on time.

#### What is Being Done?

We have continued our quarterly monitoring for PFAS6 as required and all results are below the MCL of 20 nanograms per liter (ng/L). Our operators have been re-trained on the importance of monitoring the turbidity in our water and our online turbidimeters are calibrated monthly. The required report for the 90th percentile for lead and copper has been submitted to Massachusetts Department of Environmental Protection and a new laboratory has been chosen to analyze Methuen's water.

#### What Should You Do?

At this time there is nothing you need to do. You may continue to drink the water and if a situation arises where the water is no longer safe to drink, you will be notified within 24 hours.

## WATER QUALITY DEFINITIONS

- **90th Percentile:** Out of every 10 homes sampled, 9 were at or below this level.
- **AL (Action Level):** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
- **MCL (Maximum Contaminant Level):** The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
- **MCLG (Maximum Contaminant Level Goal):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
- **MRDL (Maximum Residual Disinfectant Level):** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- **MRDLG (Maximum Residual Disinfectant Level Goal):** The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- **NA:** Not available.
- **NTU (Nephelometric Turbidity Units):** Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.
- **ppb (parts per billion):** One part substance per billion parts water (or micrograms per liter).
- **ppm (parts per million):** One part substance per million parts water (or milligrams per liter).

## STORM WATER—NPDES

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

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

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

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



E.Langlais @bulldog\_aerial

## WATER CONSERVATION

### INDOOR TIPS

- Fix that leaky toilet. You'll save 50 gallons a day or more.
- Never use your toilet as a wastebasket. You'll save 1 to 2 gallons per flush (and you'll save your pipes)
- 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.



### OUTDOOR TIPS

- Aerate your soil in the spring and fall. This will aid water absorption and retention.
- Use mulch in your flower beds. Mulch will keep roots cool and moist and reduce weeds.
- Water your lawn overnight or before 5 am. Mid-day watering will result in evaporation.
- One inch of water a week is plenty. After heavy rains, you may not need to water for 10 to 14 days.
- Raise the mower blade to 2 or 3 inches or more. Longer grass retains moisture and competes better against weeds.

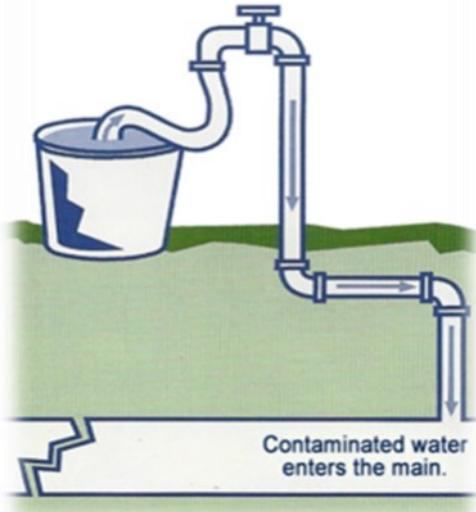


# CROSS CONNECTIONS & BACKFLOWS

## What is a cross connection?

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

A drop in water pressure due to a break in the water main causes water to flow in reverse.



## What is a backflow?

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

## Simple steps to prevent cross connection hazards:

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

For more information, review the **Cross-connection Control Manual** from the U.S. EPA's Web site at:

<http://water.epa.gov/infrastructure/drinkingwater/pws/crossconnectioncontrol/index.cfm>

You can also call the Safe Drinking Water Hotline at (800) 426-4791.

# WHAT ARE PFAS AND WHY ARE THEY A PROBLEM?

PFAS in drinking water is an important emerging issue nationwide. Because PFAS are water soluble, over time PFAS from some firefighting foam, manufacturing sites, landfills, spills, air deposition from factories and other releases can seep into surface soils. From there, PFAS can leach into groundwater or surface water, and can contaminate drinking water. PFAS have also been found in rivers, lakes, fish, and wildlife.

Exposure can occur when someone uses certain products that contain PFAS, eats PFAS-contaminated food, or drinks PFAS-contaminated water. When ingested, some PFAS can build up in the body and, over time, these PFAS may increase to a level where health effects could occur.

On October 2, 2020, MassDEP published its PFAS public drinking water standard, called a Massachusetts Maximum Contamination Level (MMCL), of 20 nanograms per liter (ng/L) (or parts per trillion (ppt)) – individually or for the sum of the concentrations of six specific PFAS. These PFAS are perfluorooctane sulfonic acid (PFOS); perfluorooctanoic acid (PFOA); perfluorohexane sulfonic acid (PFHxS); perfluorononanoic acid (PFNA); perfluoroheptanoic acid (PFHpA); and perfluorodecanoic acid (PFDA). MassDEP abbreviates this set of six PFAS as "PFAS6." This drinking water standard is set to be protective against adverse health effects for all people consuming the water.

The Methuen Water Treatment Laboratory tested for PFAS during the Unregulated Contaminant Monitoring Rule 3– which occurred during multiple sampling events throughout 2013 and 2014. The city was fortunate enough in 2019 to obtain a grant that allowed us to be part of a PFAS study by MassDEP for public water systems that use the Merrimack River as their source water. Samples were collected in November of 2019 and March of 2020. All results were below the proposed MCL. As a result, the state has granted the city with a quarterly sampling schedule for PFAS and we started our first official round of sampling January 2021. If you have any questions regarding PFAS please visit the links below or for more specific information regarding Methuen and PFAS contact our lab director [mwoodbury@ci.methuen.ma.us](mailto:mwoodbury@ci.methuen.ma.us) <https://www.epa.gov/pfas/basic-information-pfas>

<https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas>



## LEAD AND DRINKING WATER

Lead can leach into tap water if the service line that connects your home to the water main in the street is made of lead. The pipes that carry water in the street are usually made of iron or steel, and do not add lead to your water. More information about lead service lines is below.

- Lead primarily enters drinking water through plumbing materials and service lines. Source waters are rarely the cause of elevated lead levels in finished drinking water.
- Corrosive (e.g., low pH or acidic) water can result in the leaching of lead from service lines and plumbing materials into drinking water.

### Lead can also get into tap water if:

- You have lead pipes in your home.
- You have lead solder on pipes or brass fixtures in your home.

Lead solder was banned in 1989. Homes built before then will likely contain lead soldered pipes. Corrosion or wearing-away of lead-based materials can add lead to tap water, especially if water sits in the pipes for a long time before use.

### About Lead Service Lines

The service line is the pipe that connects your house to the water main in the street. Some service lines that run from older homes (usually those built before 1940) to the utility water main are lead. Many of these older service lines have been replaced, but your home could still have one. To determine if your home has a lead service line you or your plumber need to inspect the service line. Lead service lines are generally a dull gray color and are very soft. You can identify them by carefully scratching with a key. On a lead pipe, the area you've scratched will turn a bright silver color. Do not use a knife or other sharp instrument, and take care not to puncture a hole in the pipe.

**\*\* THE CITY PERFORMED OUR SCHEDULED LEAD AND COPPER TESTING SUMMER 2021 AND WILL AGAIN IN 2024. \*\***

**Results were made available to the public in October 2021**

## FOREST STREET TANK

Here it stands! 100 feet tall and over 80 feet wide, this massive structure holding just under 4 million gallons of the city's drinking water is starting to show its age. The Forest Street Steel standpipe was built in the early 1970's by Chicago Bridge & Iron Corporation. This tank is a major component of the City's Water Distribution System.

As the photo shows, throughout the years, the outside protective coatings are failing, and the inside is also starting to break down. In 2017 and again in 2020, the City has had certified tank inspection reports completed for tracking the steel tanks coating conditions. The recommendations, from these reports, is a complete refurbish of the tank inside and out before major repairs are needed or water quality concerns arise.

The Department of Environmental Protection drinking water division has reviewed the tank inspection reports and has suggested the City adheres to the third-party recommendations. **The Department of Public Works Water Division is requesting Capital Improvement funding again this year to start this multiyear complicated but dually needed project.**



## INFORMATION ON THE INTERNET

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

## POR FAVOR LEA

Este informe contiene información importante acerca de su agua potable. Haga que alguien lo traduzca para usted, o hable con alguien que lo entiende.