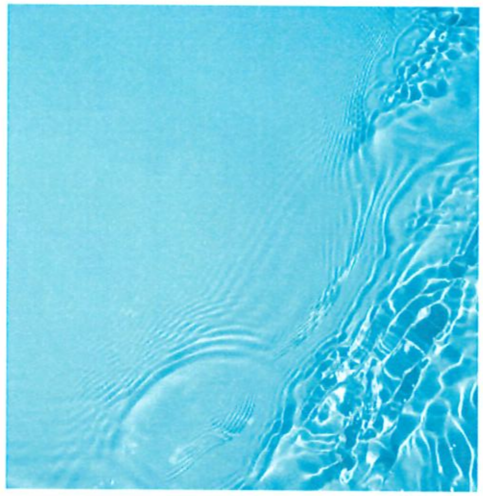

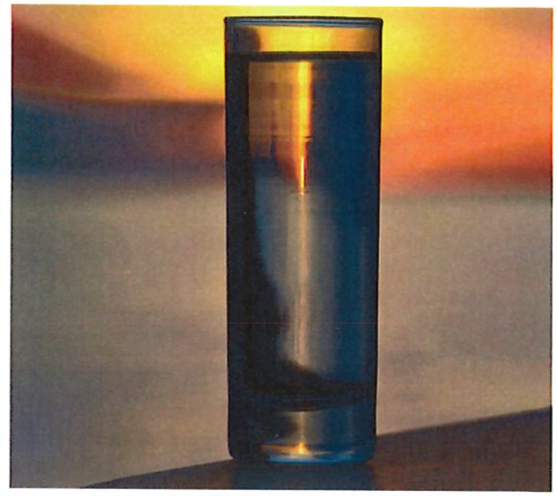

ANNUAL WATER QUALITY REPORT

Reporting Year 2023

Presented By
Manchester Water Works

PWS ID#: NH1471010

Our Commitment

We are pleased to present to you this year's annual water quality report. This report is a snapshot of last year's water quality covering all testing performed between January 1 and December 31, 2023. Included are details about your source of water, what it contains, and how it compares to standards set by regulatory agencies. Our constant goal is to provide you with a safe and dependable supply of drinking water. We want you to understand the efforts we make to continually improve the water treatment process and protect our water resources. We are committed to ensuring the quality of your water and providing you with this information because informed customers are our best allies.

Naturally Occurring Bacteria

The simple fact is, bacteria and other microorganisms inhabit our world. They can be found all around us: in our food; on our skin; in our bodies; and in the air, soil, and water. Some are harmful to us, and some are not. Coliform bacteria are common in the environment and generally not harmful themselves. The presence of this bacterial form in drinking water is a concern because it indicates that the water may be contaminated with other organisms that can cause disease. Throughout the year, we tested many water samples for coliform bacteria. In that time, none of the samples came back positive for the bacteria.

Federal regulations require that public water that tests positive for coliform bacteria must be further analyzed for fecal coliform bacteria. Fecal coliforms are present only in human and animal waste. Because these bacteria can cause illness, it is unacceptable for fecal coliform to be present in water at any concentration. Our tests indicate no fecal coliform is present in our water.

Think before You Flush!

Flushing unused or expired medicines can be harmful to your drinking water. Properly disposing of unused or expired medication helps protect you and the environment. Keep medications out of our waterways by disposing responsibly. To find a convenient drop-off location near you, please visit https://bit.ly/3IeRyXy.

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. Environmental Protection Agency (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 at (800) 426-4791 or http://water.epa.gov/drink/hotline.

What's a Cross-Connection?

Cross-connections that contaminate drinking water distribution lines are a major concern. A cross-connection is formed at any point where a drinking water line connects to equipment (boilers), systems containing chemicals (air conditioning systems, fire sprinkler systems, irrigation systems), or water sources of questionable quality. Cross-connection contamination can occur when the pressure in the equipment or system is greater than the pressure inside the drinking water line (backpressure). Contamination can also occur when the pressure in the drinking water line drops due to fairly routine occurrences (main breaks, heavy water demand), causing contaminants to be sucked out from the equipment and into the drinking water line (backsiphonage).

Outside water taps and garden hoses tend to be the most common sources of cross-connection contamination at home. The garden hose creates a hazard when submerged in a swimming pool or attached to a chemical sprayer for weed killing. Garden hoses that are left lying on the ground may be contaminated by fertilizers, cesspools, or garden chemicals. Improperly installed valves in your toilet could also be a source of cross-connection contamination.

Community water supplies are continuously jeopardized by cross-connections unless appropriate valves, known as backflow prevention devices, are installed and maintained. We have surveyed industrial, commercial, and institutional facilities in the service area to make sure that potential cross-connections are identified and eliminated or protected by a backflow preventer. We also inspect and test backflow preventers to make sure that they provide maximum protection. For more information on backflow prevention, contact the Safe Drinking Water Hotline at (800) 426-4791.

Community Participation

You are invited to attend our Water Board meetings and participate in discussions about your drinking water. A schedule of meeting times is posted at www.manchesternh.gov/wtr. Please call our office at (603) 792-2803 to confirm your intent to attend.

QUESTIONS?

For more information about this report, or for any questions relating to your drinking water, please call David G. Miller, P.E., Deputy Director, Water Supply, at (603) 792-2851, or email dmiller@manchesternh.gov.

Substances That Could Be in Water

To ensure that tap water is safe to drink, the U.S. EPA prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration 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, 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 stormwater 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 stormwater runoff, and residential uses;

Organic Chemical Contaminants, including per- and polyfluoroalkyl substances, synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production and may also come from gas stations, urban stormwater runoff, and septic systems;

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

For more information about contaminants and potential health effects, call the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

Additional Information

MWW became a charter member of the Partnership for Safe Water in 1995 and, through volunteer efforts, helped shape the framework for how self-assessment and optimization guidance could be promoted and embraced nationally by utilities in the wake of the 1993 Milwaukee cryptosporidium crisis. As an active utility member, MWW embraced the importance and significance of the partnership as a natural fit as we continued striving to provide the safest and highest-quality water possible for our customers. A focus on achieving, maintaining, or exceeding partnership goals has become a critical measuring stick for ongoing improvements and utility growth going forward.

Manchester's Phase III self-assessment report was submitted to the partnership in late 2001, and we received the Phase III Director's Award in August 2002. MWW continued to collect and report annual partnership data over the next decade with an eye on Phase IV - Excellence in Water Treatment. In July 2011, our team submitted the Phase IV application demonstrating our path to optimization. MWW received notice in January 2012 that the Lake Massabesic water treatment plant would be recognized as the 11th facility in the nation to achieve Phase IV, a status we proudly maintain today.

David G. Miller, P.E.

Deputy Director

Manchester Water Works

PARTNERSHIP FOR SAFE WATER

Lead in Home Plumbing

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. We are responsible for providing high-quality drinking water, but we 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 two 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 (800) 426-4791 or www.epa.gov/safewater/lead.

Where Does My Water Come From?

Since 1874 Lake Massabesic has served as the water supply for Manchester and portions of six surrounding communities. Recently we began serving communities to the south and east, including portions of Salem, Hampstead, Atkinson, and Plaistow. In order to satisfy stringent state and federal drinking water regulations, the lake water is purified at Manchester's water treatment plant. This facility was completed in 1974 and has been routinely updated with state-of-the-art equipment to improve quality control and operational efficiency, including a significant upgrade from 2003 to 2006. Located adjacent to Lake Massabesic, the plant treats all the city's water before it is pumped into a 500-mile piping network for distribution to homes and industries.

Beginning in August 2023, following completion of the new Merrimack River water treatment facility in Hooksett, an additional source of water from the Merrimack River was activated to provide a much-needed supply for our customers. This new facility produces water that meets or exceeds the high level of quality of our Lake Massabesic plant.

Source Water Assessment

In compliance with a federal mandate, the New Hampshire Department of Environmental Services (DES) performed a source water assessment of Lake Massabesic in September 2002. The assessment looked at the drainage area for the lake and ranked its vulnerability to contamination. Lake Massabesic received four high and four medium vulnerability ratings and low vulnerability ratings for five additional categories.

Concern was raised over the detection of methyl tert-butyl ether (MTBE), now prohibited, which came from reformulated gasoline. Concern was also raised over potential contamination sources on the watershed, such as highways. Overall, the report presents a positive picture of Manchester's water source and its condition. While Manchester Water Works (MWW) has done its best to protect Lake Massabesic, we understand more than ever that we rely heavily on the continued efforts of each citizen and community to uphold watershed standards and practices to preserve this precious resource. The complete assessment report is available for review at our website or www.des.nh.gov/sites/g/files/ehbemt341/files/documents/manchester.pdf.

Information on the Internet

The U.S. EPA (https://goo.gl/TFAMKc) and CDC (www.cdc.gov) websites provide a substantial amount of information on many issues relating to water resources, water conservation and public health. Also, the New Hampshire DES website (http://bit.ly/3pK4cDO) provides complete and current information on water issues, including valuable information about our watershed.

Safeguard Your Drinking Water

Protection of drinking water is everyone's responsibility. You can help protect your community's drinking water source in several ways:

- Eliminate excess use of lawn and garden fertilizers and pesticides – they contain hazardous chemicals that can reach your drinking water source.
- Pick up after your pets.
- If you have your own septic system, properly maintain it to reduce leaching to water sources, or consider connecting to a public water system.
- Dispose of chemicals properly; take used motor oil to a recycling center.
- Volunteer in your community. Find a watershed or wellhead protection organization in your community and volunteer to help. If there are no active groups, consider starting one. Use U.S. EPA's Adopt Your Watershed to locate groups in your community.
- Organize a storm drain stenciling project with others in your neighborhood. Stencil a message next to the street drain reminding people "Dump No Waste – Drains to River" or "Protect Your Water." Produce and distribute a flyer for households to remind residents that storm drains dump directly into your local water body.

Tap vs. Bottled

Thanks in part to aggressive marketing, the bottled water industry has successfully convinced us all that water purchased in bottles is a healthier alternative to tap water. However, according to a four-year study conducted by the Natural Resources Defense Council (NRDC), bottled water is not necessarily cleaner or safer than most tap water. In fact, about 40 percent of bottled water is actually just tap water, according to government estimates.

The Food and Drug Administration (FDA) is responsible for regulating bottled water, but these rules allow for less rigorous testing and purity standards than those required by the U.S. EPA for community tap water. For instance, the high mineral content of some bottled waters makes them unsuitable for babies and young children. Further, the FDA completely exempts bottled water that's packaged and sold within the same state, which accounts for about 70 percent of all bottled water sold in the United States.

People spend 10,000 times more per gallon for bottled water than they typically do for tap water. If you get your recommended eight glasses a day from bottled water, you could spend up to $1,400 annually. The same amount of tap water would cost about 49 cents. Even if you installed a filter device on your tap, your annual expenditure would be far less than what you'd pay for bottled water. For a detailed discussion on the NRDC study results, visit https://goo.gl/Jxb6xG.

Lake Massabesic Water Treatment Facility Process

Raw Water

Raw water from Lake Massabesic is conveyed through a 60-inch high-density polyethylene pipeline intake that extends 430 feet from the shoreline into a low-lift pump station constructed in 1997. The original intake and pump station built in 1906 and renovated for raw water service in 1974 have been discontinued. Four variable-speed pumps deliver raw water through a 48-inch pipeline to the rapid mix chambers. This pipeline is equipped with a soda ash feed point where pH and alkalinity are adjusted prior to coagulation.

Rapid Mixing and Coagulation

In the rapid mix chamber, the primary treatment chemical, aluminum sulfate, is added to begin the process of coagulation. Two rapid mix chambers are configured in series with the capability of adding the coagulants into either or both chambers. High-speed mixers ensure complete dispersion of these chemicals, enabling them to react with the natural dissolved and particulate matter in the water, collide, and form larger particles.

Flocculation

Flow from the rapid mix chambers is distributed evenly into four flocculation basins. The flocculation basins are configured in two stages separated by a baffle wall, with the second-stage mixers set at a slightly slower speed than the first-stage mixers.

Sedimentation

The sedimentation process allows the water to flow slowly through a long, deep, quiescent basin that provides sufficient time for the floc particles to settle to the bottom to form sludge, a treatment process by-product. Sludge is periodically removed by isolating one of the four parallel basins each week and decanting and pumping the sludge layer to a lagoon where it is eventually dried and moved to a permitted landfill.

Intermediate Ozone

Settled water flows into an intermediate pump station, where it is lifted into the ozone contact chambers. Ozone is a powerful oxidant and disinfectant that removes color, taste, and odor and kills or inactivates harmful organisms in the water. Ozone is generated on-site by passing a high-voltage electric current across a dielectric discharge gap through a pure oxygen stream. Three 500-pound-per-day ozone generators produce the required ozone gaseous stream that is injected into four ozone contact chambers through fine bubble diffusers. The contact chambers provide the necessary time for completion of the ozone reaction. Residual (excess) ozone is removed from the water by applying sodium bisulfite before it exits the contact chambers and continues to the filters. Excess ozone gas that accumulates above the contact chambers is removed under vacuum through a thermal-catalytic ozone destruct process and vented to the atmosphere.

Granular Activated Carbon Filtration

Following the intermediate ozone, the water passes through one of eight deep bed granular activated carbon filters. Each filter contains six feet of biologically active media that completes the physical/biological removal process.

Chemical Addition

After filtration, sodium hypochlorite is added, and aqueous ammonia is added into the hydraulic control structure in a closely controlled ratio (approximately 4.5 parts chlorine to 1 part ammonia) to form monochloramine. Monochloramine is a residual disinfectant that minimizes disinfectant by-product formation and inhibits bacterial growth as water travels throughout the distribution system. Soda ash is added once again to raise the pH to prevent pipe corrosion and provide additional alkalinity. Phosphoric acid is also added for corrosion control. Finally, fluorosilicic acid is added for dental protection.

Clearwell and Finished Water

From the hydraulic control structure, water flows into a 700,000-gallon clearwell and finished water pumping station. Seven vertical turbine pumps (three for the low-service pressure zone and four for the high-service pressure zone) lift finished water into the distribution system.

Merrimack River Water Treatment Facility Process

Raw Water

A combination of groundwater and surface water enters radial collector well laterals through a natural sand-and-gravel layer about 50 feet below the riverbed. Three variable-speed pumps deliver raw water through a 20-inch pipeline three quarters of a mile to the water treatment facility.

Greensand Filtration

The treatment facility has four pressure filters filled with a coated media called greensand for manganese and iron removal. Prior to entering the greensand filters, the pH of the raw water is adjusted with caustic soda, and sodium hypochlorite is added to assist with media regeneration. These filters remove the majority of the manganese and iron to well below discernable levels. At regular intervals, the media in the filters are backwashed, and the solids that are removed are discharged to open air lagoons on the property to be dried and disposed of at a later date at a permitted landfill.

Granular Activated Carbon Contactors

Flow from the greensand filters is distributed evenly into five granular activated carbon contactors, which are primarily used to improve taste and odor and remove any remaining organics.

Ultraviolet Light Disinfection

Water from the contactors flows to three ultraviolet (UV) disinfection chambers for virus and pathogen inactivation. After the UV disinfection, sodium hypochlorite is added for disinfection before the water goes to the clearwell.

Clearwell and Finished Water

Water flows from the UV area underground to a 500,000-gallon clearwell to provide contact time for adequate disinfection. Flows from the clearwell come back into the treatment facility, where ammonia is added to form monochloramine, a secondary/residual disinfectant that minimizes disinfection by-product formation and inhibits bacterial growth as water travels through the distribution system. Caustic soda is added once again to raise the pH to prevent pipe corrosion. Phosphoric acid is also added for corrosion control, and fluorosilicic acid is added for dental protection.

What Are PFAS?

Per- and polyfluoroalkyl substances (PFAS) are a group of manufactured chemicals used worldwide since the 1950s to make fluoropolymer coatings and products that resist heat, oil, stains, grease, and water. During production and use, PFAS can migrate into the soil, water, and air. Most PFAS do not break down; they remain in the environment, ultimately finding their way into drinking water. Because of their widespread use and their persistence in the environment, PFAS are found all over the world at low levels. Some PFAS can build up in people and animals with repeated exposure over time.

The most commonly studied PFAS are perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS). PFOA and PFOS have been phased out of production and use in the United States, but other countries may still manufacture and use them.

Some products that may contain PFAS include:

- Some grease-resistant paper, fast food containers/wrappers, microwave popcorn bags, pizza boxes
- Nonstick cookware
- Stain-resistant coatings used on carpets, upholstery, and other fabrics
- Water-resistant clothing
- Personal care products (shampoo, dental floss) and cosmetics (nail polish, eye makeup)
- Cleaning products
- Paints, varnishes, and sealants

Even though recent efforts to remove PFAS have reduced the likelihood of exposure, some products may still contain them. If you have questions or concerns about products you use in your home, contact the Consumer Product Safety Commission at (800) 638-2772. For a more detailed discussion on PFAS, please visit http://bit.ly/3Z5AMm8.

Count on Us

Delivering high-quality drinking water to our customers involves far more than just pushing water through pipes. Water treatment is a complex, time-consuming process. Because tap water is highly regulated by state and federal laws, water treatment plant and system operators must be licensed and are required to commit to long-term, on-the-job training before becoming fully qualified. Our licensed water professionals have a basic understanding of a wide range of subjects, including mathematics, biology, chemistry, and physics. Some of the tasks they complete on a regular basis include:

- Operating and maintaining equipment to purify and clarify water.
- Monitoring and inspecting machinery, meters, gauges, and operating conditions.
- Conducting tests and inspections on water and evaluating the results.
- Maintaining optimal water chemistry.
- Applying data to formulas that determine treatment requirements, flow levels, and concentration levels.
- Documenting and reporting test results and system operations to regulatory agencies.
- Serving our community through customer support, education, and outreach.

So the next time you turn on your faucet, think of the skilled professionals who stand behind each drop.

Benefits of Chlorination

Disinfection, a chemical process used to control disease-causing microorganisms by killing or inactivating them, is unquestionably the most important step in drinking water treatment. By far, the most common method of disinfection in North America is chlorination.

Before communities began routinely treating drinking water with chlorine (starting with Chicago and Jersey City in 1908), cholera, typhoid fever, dysentery, and hepatitis A killed thousands of U.S. residents annually. Drinking water chlorination and filtration have helped to virtually eliminate these diseases in the U.S. Significant strides in public health are directly linked to the adoption of drinking water chlorination. In fact, the filtration of drinking water and the use of chlorine are probably the most significant public health advancements in human history.

How chlorination works:

- Potent Germicide Reduction of many disease-causing microorganisms in drinking water to almost immeasurable levels.
- Taste and Odor Reduction of many disagreeable tastes and odors from foul-smelling algae secretions, sulfides, and decaying vegetation.
- Biological Growth Elimination of slime bacteria, molds, and algae that commonly grow in water supply reservoirs, on the walls of water mains, and in storage tanks.
- Chemical Removal of hydrogen sulfide (which has a rotten egg odor), ammonia, and other nitrogenous compounds that have unpleasant tastes and hinder disinfection. It also helps to remove iron and manganese from raw water.

BY THE NUMBERS

5.1 TRILLION

The dollar value needed to keep water, wastewater, and stormwater systems in good repair.

2

How often in minutes a water main breaks.

1.7 TRILLION

The gallons of drinking water lost each year to faulty, aging, or leaky pipes.

12 THOUSAND

The average amount in gallons of water used to produce one megawatt-hour of electricity.

47.5 TRILLION

The amount in gallons of water used to meet U.S. electric power needs in 2020.

33

The percentage of water sector employees who will be eligible to retire by 2033.

What Causes the Pink Stain on Bathroom Fixtures?

The reddish-pink color frequently noted in bathrooms on shower stalls, tubs, tile, toilets, sinks, and toothbrush holders and on pets' water bowls is caused by the growth of the bacterium Serratia marcescens. Serratia is commonly isolated from soil, water, plants, insects, and vertebrates (including humans). The bacteria can be introduced into the house through any of these sources. The bathroom provides a perfect environment (moist and warm) for bacteria to thrive.

The best solution to this problem is to clean and dry these surfaces to keep them free from bacteria. Chlorine-based compounds work best, but keep in mind that abrasive cleaners may scratch fixtures, making them more susceptible to bacterial growth. Chlorine bleach can be used periodically to disinfect the toilet and help eliminate the occurrence of the pink residue. Keeping bathtubs and sinks wiped down using a solution that contains chlorine will also help to minimize its occurrence. Serratia will not survive in chlorinated drinking water.

Q&A

What type of container is best for storing water?
Consumer Reports has consistently advised that glass or bisphenol A (BPA)-free plastics such as polyethylene are the safest choices. To be on the safe side, do not use any container with markings on the recycle symbol showing 7PC (that's code for BPA). You could also consider using stainless steel or aluminum with BPA-free liners.

How much emergency water should I keep?
Typically, one gallon per person per day is recommended. For a family of four, that would be 12 gallons for three days. Humans can survive without food for one month but can only survive one week without water.

How long can I store drinking water?
The disinfectant in drinking water will eventually dissipate, even in a closed container. If that container housed bacteria prior to filling up with the tap water, the bacteria may continue to grow once the disinfectant has dissipated. Some experts believe that water can be stored up to six months before needing to be replaced. Refrigeration will help slow the bacterial growth.

How long does it take a water supplier to produce one glass of treated drinking water?
It can take up to 45 minutes to produce a single glass of drinking water.

How many community water systems are there in the U.S.?
About 53,000 public water systems across the United States process 34 billion gallons of water per day for home and commercial use. Eighty-five percent of the population is served by these systems.

Which household activity wastes the most water?
Most people would say the majority of water use comes from showering or washing dishes; however, toilet flushing is by far the largest single use of water in a home (accounting for 40 percent of total water use). Toilets use about 4 to 6 gallons per flush, so consider an ultra-low-flow (ULF) toilet, which requires only 1.5 gallons.

Fluoridation Information

Your public water supply is fluoridated. According to the CDC, if a child under the age of six months is exclusively consuming infant formula reconstituted with fluoridated water, there may be an increased chance of dental fluorosis. Consult your child's healthcare provider for more information.

Test Results

Our water is monitored for many different kinds of substances on a very strict sampling schedule. And, the water we deliver must meet specific health standards. Here, we only show those substances that were detected in our water (a complete list of all our analytical results is available upon request). Remember that detecting a substance does not mean the water is unsafe to drink; our goal is to keep all detects below their respective maximum allowed levels.

The State recommends monitoring 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 year in which the sample was taken.

We participated in the 5th stage of the U.S. EPA's Unregulated Contaminant Monitoring Rule (UCMR5) program by performing additional tests on our drinking water. UCMR5 sampling benefits the environment and public health by providing the U.S. EPA with data on the occurrence of contaminants suspected to be in drinking water, in order to determine if U.S. EPA needs to introduce new regulatory standards to improve drinking water quality. Unregulated contaminant monitoring data are available to the public so please feel free to contact us if you are interested in obtaining that information. If you would like more information on the U.S. EPA's Unregulated Contaminants Monitoring Rule, please call the Safe Drinking Water Hotline at (800) 426-4791.

REGULATED SUBSTANCES

				Lake Massabesic Water Treatment Plant		Merrimack River Water Treatment Plant			
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Barium (ppm)	2023	2	2	0.011	0.0085–0.0135	0.00525	0.005–0.0055	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Fluoride (ppm)	2023	4	4	0.68	0.51–0.76	0.52	<0.2–0.64	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Haloacetic Acids [HAAs]–Stage 2 (ppb)	2023	60	NA	3.83	<1–9.0	3.83	<1–9.0	No	By-product of drinking water disinfection
Nitrate (ppm)	2023	10	10	0.127	0.064–0.326	0.505	0.053–1.28	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Nitrite (ppm)	2023	1	1	0.021	<0.005–0.190	0.205	<0.005–0.19	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Perfluorooctanoic Acid [PFOA] (ppt)	2023	12	0	4.68	NA	NA	NA	No	Discharge from industrial processes; Wastewater treatment; Residuals from firefighting foam; Runoff and leachate from landfills and septic systems
Total Organic Carbon [TOC] (ppm)	2023	TT[1]	NA	1.76	1.48–2.06	0.70	<0.5–0.77	No	Naturally present in the environment
TTHMs [total trihalomethanes]–Stage 2 (ppb)	2023	80	NA	4.1	0.6–12.0	4.1	0.6–12.0	No	By-product of drinking water disinfection
Turbidity[2] (NTU)	2023	TT	NA	0.033	NA	0.094	NA	No	Soil runoff
Turbidity (lowest monthly percent of samples meeting limit)	2023	TT = 95% of samples meet the limit	NA	100	NA	100	NA	No	Soil runoff

Tap water samples were collected for lead and copper analyses from sample sites throughout the community

				Lake Massabesic Water Treatment Plant		Merrimack River Water Treatment Plant			
SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH %ILE)	SITES ABOVE AL/TOTAL SITES	AMOUNT DETECTED (90TH %ILE)	SITES ABOVE AL/TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2023	1.3	1.3	0.0795	0/101	NA	NA	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2023	15	0	<1.0	0/101	NA	NA	No	Lead service lines; Corrosion of household plumbing systems, including fittings and fixtures; Erosion of natural deposits

SECONDARY SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	MCLG	Lake Massabesic Water Treatment Plant		Merrimack River Water Treatment Plant		VIOLATION	TYPICAL SOURCE
				AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH		
Chloride (ppm)	2023	250	NA	49	44–54	81	52–150	No	Runoff/leaching from natural deposits
Fluoride (ppm)	2023	2.0	NA	0.68	0.51–0.76	0.52	<0.2–0.64	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Manganese (ppb)	2023	50	NA	7.0	NA	NA	NA	No	Leaching from natural deposits
Nickel (ppm)	2023	NS	NA	NA	NA	0.0007	NA	No	Naturally occurring; Electroplating; Battery production; Ceramics
pH (units)	2023	6.5-8.5	NA	7.71	NA	7.84	NA	No	Naturally occurring
Sodium (ppm)	2023	100-250	NA	50.7	45.3–56	47.9	43.1–52.7	No	Naturally occurring
Sulfate (ppm)	2023	250	NA	25.3	24–28	6	5–7	No	Runoff/leaching from natural deposits; Industrial wastes
Zinc (ppm)	2023	5	NA	0.001	<0.001–0.002	<0.001	NA	No	Runoff/leaching from natural deposits; Industrial wastes

UNREGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	Lake Massabesic Water Treatment Plant		Merrimack River Water Treatment Plant		TYPICAL SOURCE
		AMOUNT DETECTED	RANGE LOW-HIGH	AMOUNT DETECTED	RANGE LOW-HIGH	
Perfluorobutanoic Acid [PFBA] (ppt)	2023	3.25	ND–3.25	2.55	NA	NA
Perfluorooctanoic Acid [PFOA] (ppt)	2023	4.68	4.0–5.0	NA	NA	NA

[1] The value reported under Amount Detected for TOC is the lowest ratio between percentage of TOC actually removed and percentage of TOC required to be removed. A value of greater than 1 indicates that the water system is in compliance with TOC removal requirements. A value of less than 1 indicates a violation of the TOC removal requirements.

[2] Turbidity is a measure of the cloudiness of the water. It is monitored by surface water systems because it is a good indicator of water quality and thus helps measure the effectiveness of the treatment process. High turbidity can hinder the effectiveness of disinfectants.

Definitions

90th %ile: The levels reported for lead and copper represent the 90th percentile of the total number of sites tested. The 90th percentile is equal to or greater than 90% of our lead and copper detections.

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 applicable.

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).

ppt (parts per trillion): One part substance per trillion parts water (or nanograms per liter).

SMCL (Secondary Maximum Contaminant Level): These standards are developed to protect aesthetic qualities of drinking water and are not health based.

TT (Treatment Technique): A required process intended to reduce the level of a contaminant in drinking water.