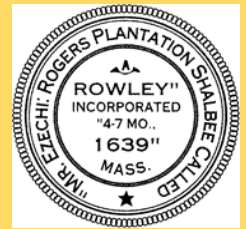


2016 Annual Drinking Water Quality Report ROWLEY WATER DEPARTMENT

Mass DEP PWSID # 3254000



PUBLIC WATER SYSTEM INFORMATION

To better serve our customers we have updated our phone system. You now must choose an option from a menu in the automated attendant.

Press 3 Customer Service - questions with water bills, payments or to schedule an appointment or stay on the line for the next available customer service representation. M-F 7:00am to 5:00pm.

Press 4 Accounts Payable

Press 5 Water Treatment Plant

Press 9 Employee Directory

Extension 101 Katherine Bento
Extension 102 Accounts Payable
Extension 104 Bob Gray Distribution Foreman
Extension 201 Marybeth Wiser, Water Superintendent
Extension 202 Rob Swiniarski, Chief Operator
Extension 203 Mike LaFlower, Assistant Chief Water

Mission Statement: To provide adequate water quantity and quality at a reasonable cost that meets or exceeds state and federal drinking water standards, and to provide sufficient water for fire protection, maintain adequate pressures throughout the distribution system and administer first-rate customer service to the Town of Rowley.

To maintain and operate all aspects of the municipal water supply in an environmentally sound fashion, maintain regulatory compliance, adhere to established budgets and provide drinking water of the highest quality and optimum fire protection. To maximize system reliability, minimize losses, repair or improve system deficiencies and operate within an established budget. Maintain regulatory compliance and protect the residents from contamination or back siphon/backflow water quality issues.

Our goal is to ensure that we will have ample water supplies in the future that are contaminant free.

Major water issues are usually presented at regular bi-weekly Water Board Meetings. We encourage you to get involved.

Water System Improvements: Our water system is routinely inspected by Mass DEP. Mass DEP inspects our system for its technical, financial, and managerial capacity to provide safe drinking water to you. To ensure that we provide the highest quality of water available, your water system is operated by qualified, licensed operators certified by Mass DEP, who oversee the routine operations of our system.

As part of our on-going commitment to you, last year we made the following improvements to our system. We flushed and performed a system wide leak detection of 43 miles of water main

A sanitary Survey was conducted in August 2016 by the Mass DEP. No violations were found during the survey, however several deficiencies were noted: The water department needs to evaluate the capacity of Well No. 2, install a fence in the Zone I for Well No 2, upgrade the access road to the Water Treatment Plant and install 24 mesh screen on the overflow pipe for the Prospect Hill Tank. The cost associated with complying with these deficiencies is approximately \$225,000. These funds were appropriated at the November 14, 2016 STM. Money was transferred from the water department stabilization account into Article 15 for the purpose.

We experienced a flood at the Water Treatment Plant on June 30, 2016 due to a failure of a coupling on the 4" domestic water service located in the maintenance room of the treatment plant. The Emergency Response plan was activated for loss of a source. It was determined after investigation that the coupling was installed defective right from the manufacturer. We lost 95,000 gallons of water. At no time did this compromise the water quality. We worked with the Mass DEP and local contractors and were able to get the Water plant back online within 24 hours. We worked with the insurance company MIIA who covered almost all of the claim. The flood caused \$111,403.81 in damage. We anticipate the restoration of the Water Plant to be complete in January 2017.

On August 18, 2016 the Mass DEP issued a state wide mandatory 24 hour no outside water use ban. The average daily flows where 510,650 gallons per day from August 1, 2016 through August 18, 2016, Compared to the average daily flow of 398,545 gallons per day from August 19, 2016 through August 31, 2016. A 22% decrease in water usage. Total annual produced in 2016 was 144.478 million gallons, compared to 161.346 million gallons in 2015. We produced 16.868 million gallons less in 2016 when compared to 2015. Thanks to all our water customers for stepping up and conserving.

We completed a comprehensive Capital Efficiency Plan (CEP) for the 20 year water main replacement program. The Capital Efficiency Plan followed a three circle approach including hydraulic evaluation, critical component assessment and asset management consideration. The distribution system is comprised of approximately 43 miles of water mains of various material types with pipe ranging from 2 to 16 inches. The final report included a prioritized list of recommended water main rehabilitation and replacement projects and the associated estimated costs for those projects to assist with the capital planning needs of the department.

PUBLIC WATER SYSTEM INFORMATION

Address:	401 Central Street PO Box 29 Rowley, MA 01969	Board of Water Commissioners:	John Manning Mark Emery Bernard Cullen
Phone:	(978) 948-2640	Water Superintendent:	MaryBeth Wiser
Website:	www.rowleywater.com	For billing or payment questions or to schedule an appointment please contact Customer Service by phone at (800) 553-5191, or by email at customer-service@pennichuck.com	
Hours:	7:00AM – 3:00PM Monday – Friday		

Flushing: The Rowley Water Department flushed the water mains in April 2016. The Water Department periodically flushes the fire hydrants throughout the town. The hydrant-flushing program is very important to the maintenance of the Town's water distribution system. During this process, it is not uncommon for a yellow, brown or reddish tint to appear in the water. Harmless mineral deposits settle in the water mains, and flushing the system stirs the deposits causing the discoloration. Flushing removes the sediments from the mains and also serves the following purposes:

- ❖ Improves water quality in the distribution system.
- ❖ Verifies the proper operation of fire hydrants and valves.
 - ❖ Helps find weaknesses in the water system.
- ❖ Checks for closed valves and weak flows in the water mains.
 - ❖ Verifies adequate fire flows for fire-fighting.







Leak Detection: Detecting and repairing leaks is one of the main components of water conservation. Leak detection has historically assumed, most if not all, leaks rise to the surface and are visible. In fact, many leaks continue below the surface for long periods of time and remain undetected. With this leak detection program, the Rowley Water Department can search for and reduce previously undetected leaks. Water lost after treatment and pressurization, but before delivered for the intended use, is water, money and energy wasted. Accurate location and repair of leaking water pipes in a supply system greatly reduces these losses.

Once a leak is detected, the Water Department will take corrective action to minimize water losses in the water distribution system. The Water Department will try to maintain unaccounted-for-water not be more than 10 percent of the total water produced. The Water Department hired Water & Waste Pipe Testing, Inc to conduct a survey of 43 miles of water main. We found 8.0 leaks totaling 28.0 MG of water lost. All 8.0 leaks were repaired. For more information on this report please visit our website at www.rowleywater.com.

Leak Detection

Repairing a leak will pay for itself very quickly when you consider how much water can be lost through a pinhole leak over a period of a month. "Unaccounted for" water is a major source of lost revenue for most utilities. Higher electrical and chemical bills also result from pumping and treating lost water.

Water loss as a result of a leak 0.63 mm diameter (1/4") can mean a loss of 14,952 gallons a day. If undetected for a period of 34 days, over 1/2 million gallons are lost, Help the water department reduce operating expenses, and eliminate capital expenditures for expanding water supplies by stopping your losses. The following table shows leak sizes and their approximate loss in gallons/ft on a pressurized pipeline.

Pipe Leak Size	Gallons Lost	
	Per Day	Per Month
	360	11,160
	3,096	95,976
	8,424	261,144
	14,952	463,512

A water meter measures the amount of water entering your home. Most water meters are located in basements closest to the street. They can also be in a utility closet, mechanical room or outside in a pit. Rowley's water meters measure water use in gallons. Try reading your water meter throughout the week to determine how much water you use. Your water meter is equipped with a leak detection feature and can pick up water-using appliances and fixtures that have "silent" leaks. Top two culprits for leaks are toilets and irrigation systems. The American Water Works Association estimates that up to 25% of toilets in the US leak.

YOUR DRINKING WATER SOURCE

Where does my drinking water come from? The drinking water for the Town of Rowley comes from three groundwater wells located on Town-owned parcels of land within the Parker River Basin.

How are these sources protected? Mass DEP has prepared a Source Water Assessment Program (SWAP) Report for the water supply sources serving the Town of Rowley. The SWAP Report assesses the susceptibility of public water supplies. A susceptibility rating of **high** was assigned to this system using the information collected during Mass DEP's assessment, due to the absence of hydrological barriers that could prevent migration of contamination into the Town's groundwater supply.

The complete SWAP Report is available at <http://www.mass.gov/dep/water/drinking/swapreps.htm>. You can also visit our website www.rowleywater.com for more information on the SWAP Report.

Source Name	MassDEP Source ID	Source Type
Well #2	3254000-02G	Groundwater
Well #3	3254000-03G	Groundwater
Well #5	3254000-05G	Groundwater

Groundwater comes from rain and snowmelt percolating through the ground and flows through the spaces between soil particles and through fractures in rock. Groundwater is vulnerable to contamination from many types of land uses and activities, including road salt, septic systems and improper disposal of hazardous materials. If the groundwater becomes contaminated, it may be impossible to eliminate the contamination so the well can be used for drinking water.

With careful use, and by reducing sources of pollution, our groundwater will continue to be an important natural resource for years to come! Residents can help protect water sources by:

- ✓ If your house or business is served by a septic system, pump out the tank every two to three years. Do not use commercial septic tank cleaners or put hazardous materials down the sink, toilet or floor drain. These materials reduce the effectiveness of the system by killing necessary microorganisms and they can pass through the system and contaminate the groundwater.
- ✓ Avoid applying hazardous or toxic materials to lawns or other areas of your property.
- ✓ Never dispose of used motor oil or other hazardous materials on your property or in storm sewers. Practicing good septic system maintenance.
- ✓ Limiting pesticide and fertilizer use and disposing of hazardous household chemicals at hazardous material collection days.
- ✓ Supporting water supply protection initiatives at the next town meeting.

Is my water treated? Our water system makes every effort to provide you with good quality drinking water. Well #3 and Well #5 are treated and filtered through the treatment plant. We add sodium hypochlorite for disinfection to protect you against microbial contaminants, potassium permanganate for manganese removal, ortho-polyphosphate for sequestration of iron, and sodium hydroxide for pH adjustment and corrosion control. Well #2 is treated with sodium hypochlorite for disinfection to protect you against microbial contaminants, ortho-polyphosphate for sequestration of iron, and sodium hydroxide for pH adjustment and corrosion control.

All reservoirs and some ground water sources contain numerous microorganisms, some of which can cause people to become sick. To eliminate disease-carrying organisms, it is necessary to disinfect the water. Disinfection does not sterilize the water; it removes harmful organisms. Sterilization is too costly and kills all microorganisms, even though most are not harmful. The Rowley Water Department adds sodium hypochlorite as its primary disinfectant. Chlorine destroys organisms by penetrating cell walls and reacting with enzymes. When combined with filtration, disinfection with chlorine has been proven effective at ensuring that water is free of harmful organisms and safe to drink.

Many drinking water sources in New England are naturally corrosive (i.e., they have a pH of less than 7.0). So, the water they supply has a tendency to corrode and dissolve the metal piping it flows through. This not only damages pipes but can also add harmful metals, such as lead and copper, to the water. For this reason it is beneficial to add chemicals that make the water neutral or slightly alkaline. This is done by adding any one, or a combination of several, approved chemicals. The Rowley Water Department adds sodium hydroxide to its water. This adjusts the water to a non-corrosive pH. Testing throughout the water system has shown that this treatment has been effective at reducing lead and copper concentrations.

All chemicals used for drinking water treatment are approved by one of the following organizations: National Sanitation Foundation (Now known as NSF International or UL, both accredited by the American National Standards Institute (ANSI). Chemicals must also meet standards established by the American Water Works Association (AWWA).

Is my water tested? The water quality of our system is constantly monitored by us and Mass DEP to determine the effectiveness of existing water treatment and to determine if any additional treatment is required. Last year we collected more than 200 samples to determine the presence of biological, organic and inorganic contaminants. 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. Contaminants that may be present in source water include:

- **Microbial contaminants** – include viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic contaminants** – include salts and metals, which can be naturally-occurring or result from urban storm water runoff, industrial, or domestic wastewater discharges, oil and gas production, mining, and 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** – include synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.
- **Radioactive contaminants** – can be naturally occurring or be the result of oil and gas production and mining activities.

RESERVE AND CONSERVE FOR THE FUTURE BY REDUCING, REUSING AND RECYCLING

EDUCATIONAL INFORMATION

Water Conservation: Municipal water systems face many challenges such as: meeting seasonal water demands, finding new supply sources to keep pace with growth, resource protection, water conservation, environmental protection, and the increasing stringent regulations for improved water quality. Our sustainability, as it relates to water, is dependent upon our ability to stay abreast of these changing conditions and implementation of future plans. Unfortunately, there is no “magic wand” that will make the problems go away. Therefore, sound planning is crucial. Regardless of our future supply conditions, water conservation and prudent supply management will still be our number one priority to ensure the long term availability of our water supplies. We are committed to conserving our water supplies and complying with Massachusetts state regulatory requirements governing the operation of water systems. A conscientious effort on everyone’s part is necessary for these conservation measures to have a positive effect. Your efforts are most appreciated, as we must all work together to preserve this most valuable resource for generations to come. Household water conservation not only saves water, but it saves energy too; energy needed to heat water and to run appliances. Your water meter is equipped with a leak detector. If you see a dripping faucet, you have a leak somewhere. Check all faucets for leaks; even a slow drip can waste up to 20 gallons of water in a day! Check for toilet leaks by putting a few drops of food coloring in the toilet’s tank. An “invisible” leak in the toilet wastes up to 100 gallons in a day. Only run full loads through your washing machine and dishwasher.

Here are more water saving tips:

- When washing dishes by hand, don't let the water run while rinsing
- Check your sprinkler system frequently and adjust sprinklers so only your lawn is watered and not the house, sidewalk, or street.
- Run your washing machine and dishwasher only when they are full and you could save 1000 gallons a month.
- Keep a pitcher of water in the refrigerator instead of running the tap for cold drinks, so that every drop goes down you not the drain.
- Minimize evaporation by watering during the early morning hours, when temperatures are cooler and winds are lighter.
- Use a layer of organic mulch around plants to reduce evaporation and save hundreds of gallons of water a year.
- Use a broom instead of a hose to clean your driveway or sidewalk and save 80 gallons of water every time.
- Only water your lawn when needed. A lawn only needs 1” of water each week.
- Install low-volume toilets.



Cross Connections: The purpose of this program is to protect the public potable water supply from the possibility of contamination or pollution by isolating such contaminants or pollutants which could backflow or back-siphon into the public water system. To promote the elimination or control of existing cross connections, actual or potential between its customers in-plant potable water system, and non-potable systems. To provide for the maintenance of a continuing program of cross connection control which will effectively prevent the contamination or pollution of all potable water systems by cross connection. For information regarding our program please visit the Rowley Water Department webpage at www.rowleywater.com.

What you can do to help prevent a cross-connection: Without the proper protection something as simple as a garden hose has the potential to contaminate or pollute the drinking water lines in your house. In fact, over half of the country's cross-connection incidents involve unprotected garden hoses. There are very simple steps that you, as a drinking water user, can take to prevent such hazards:

- Never submerge a hose in soapy water buckets, pet watering containers, pool, tubs, sinks, drains, or chemicals.
- Never attached a hose to a garden sprayer without the proper backflow preventer.
- Buy and install a hose bibb vacuum breaker on every threaded water fixture. The installation can be as easy as attaching a garden hose to a spigot. This inexpensive device is available at most hardware stores and home-improvement centers.
- Identify and be aware of potential cross-connections to your water line.
- Buy appliances and equipment with a backflow preventer.
- Buy and install backflow prevention devices or assemblies for all high and moderate hazard connections.

Any existing water customer who wishes to have the water meter removed and disconnect from Town water may do so. The resident needs to cut and cap the water service at their own expense. This must be witnessed by a representative of the water department. The water meter will be removed at this time. This must be completed as to avoid any cross connections between the public water supply.

If the customer wishes to keep the water meter and service the customer shall be billed monthly service fee of \$30.00 per month. The water department reads these meters and has to maintain the service connection, respond to any leaks and incur the costs for billing even if the bill sent reads zero.

At any time in the future the resident wishes to re-connect to the town water that resident shall be subject to any fees associated with the re-connection. Customers need to contact customer service at 1-800-553-5191 to schedule an appointment for discontinued water service.

- **Back-siphonage** is the reversal of normal flow in a system caused by negative pressure, vacuum or partial vacuum in the supply piping. This can be created when there is a stoppage of the water supply due to fire-fighting, main repairs or main breaks or leaks.
- **Back Pressure** is the backflow of normal flows in a system due to an increase in the downstream pressure above that of the supply pressure. Which is possible in installations such as heating systems, elevated tanks and pressure producing systems. Water tends to flow in the direction of least resistance.

Have you ever considered all of the places that you use water in your home? You may be surprised how many different ways that water can be used and possibly misused. Here are some things you can be aware of to protect the purity of water you drink, cook with or bath in.

✓ **Irrigation**

Sprinkler systems make watering you lawn and garden easier, however, if not properly installed and maintained contaminants can enter your drinking water. Water that pools around the sprinkler heads may contain contamination from chemical, fertilizer or animal waste. To help protect your water install an Atmospheric Vacuum Breaker (AVB), Pressure Vacuum Breaker (PVB), or a Reduced Pressure Principal Assembly (RP). You should consult with a professional lawn irrigation contactor or a licensed plumber.

✓ **Outside Faucets**

The garden hose is the most common cross connection in the home. It acts like an extension of the water line. The hose is attached to the outdoor faucet and the other end is connected to an aspirator that contains insecticides, fertilizer or other chemicals used with the aspirator. Another common cross connection is to leave the other end of the hose submerged in a bucket of soapy water or just by laying down on the ground. You can install a hose bibb vacuum breaker. This will isolate the faucet and protect the water supply from contamination. Each spigot at your home should have a hose-bib vacuum breaker installed. This is a simple, inexpensive device, which can be purchased at any plumbing or hardware store. Installation is as easy as attaching your garden hose to a spigot.

✓ **Sinks, Tubs**

Make sure all faucets and spray hoses are above the flood rim for your sinks in the bathroom and kitchen. Make sure when filling sinks and tubs an air gap is between the end of the faucet and the water line. Without an air gap the contents may be back-siphoned into the line during a loss of pressure. Be sure to return kitchen sink sprayer to its resting place after use.

✓ Toilets

Toilets need water to flush the waste material to the sewer system. The water that flushes the toilet enters the tank at the bottom through a small hose. The float valve (or anti-siphon ballcock) inside the tank should be the correct type so that the contents of the tank does not get back into the drinking water in your home. Proper installation for the refill tube and float valve is above the water level in the tank.

✓ Boilers

Pressure may build up inside the boiler. The water pressure in the boiler may exceed the pressure of the water feeding the boiler. This could cause a back-pressure situation and push the water into the water supply. Installing a backflow preventer with an intermediate vent will protect against back- pressure and back-siphonage and can be used under continuous pressure.

✓ Washing machine

The washing machine has a built in air gap from the factory. However you can install a single lever shutoff valve that shuts off both the hot and cold water to prevent flooding if one of the hoses breaks.

✓ Water heater

Thermal expansion occurs whenever water is heated. The backflow preventer stops the expanded water from returning to the water supply. Since the water cannot be compressed, the expanded water volume can cause a rapid increase in pressure in the piping and will often exceed the temperature setting and pressure relief valve. Installing an atmospheric vacuum breaker and a thermal expansion tank will help absorb the thermal expansion and maintain a balanced system pressure. Your system should be checked at least once every three years to ensure safe operation.

If you are the owner or manager of a property that is being used as a commercial, industrial, or institutional facility you must have your property's plumbing system surveyed for cross connection. If your property has NOT been surveyed for cross-connection, contact **Water Safety Services, Inc. @ 781-932-8787** to schedule a cross-connection survey.

The Massachusetts Drinking Water Regulations, 310 CMR 22.00, requires all public water systems to have an approved and fully implemented Cross-Connection Control Program (CCCP). The Rowley water Department is working diligently to protect the public health of its drinking water customers from the hazards caused by unprotected cross-connections. We are doing this through the implementation of our cross-connection survey program, elimination or proper protection of all identified cross-connections, the registration of all cross-connections protected by reduced pressure backflow preventers (RPBPs) or double check valve assemblies (DCVAs), and the implementation of a testing program for all RPBPs and DCVAs.

This combined cooperative effort between the Town of Rowley and customers will help ensure your water supply is protected in the distribution system and ultimately in residential homes and businesses. Remember you should contact a licensed plumber for installation of the devices.

For more information on cross connection backflow prevention contact MaryBeth Wiser, Water Superintendent @ 978-948-2640 x201. You can also visit the following websites:

- ❖ <http://www.epa.gov/safewater/crossconnection.html>
- ❖ <http://www.awwa.org>
- ❖ <http://www.usc.edu/dept/fccchr/beta/foundation.html>
- ❖ <http://www.dep.us.gov>

Sensitive populations: 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 some infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/Centers for Disease Control and Prevention (CDC) guidelines on lowering the risk of infection by cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791.

Lead: 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. The Rowley Water Department is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking.

If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>. **The 90th percentile for lead is 0.0014pp. 90th percentile for copper is 0.320ppb**

Contaminant	Date(s) Collected	Highest Result Detected	Range Detected	MCL or MRDL	MCLG or MRDLG	Violation (Y/N)	Possible Source(s) of Contamination
Lead and Copper							
Lead (ppb)	6/14/16	0.0025	0.001-0.0025	15	20	0	Corrosion of household plumbing systems; Erosion of natural deposits
Copper (ppm)	6/14/16	0.5	0.056-0.50	1.3	20	0	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives

***Lead poisoning is preventable.
If your home was built before 1988, it is more likely to have plumbing containing lead.***

Manganese: is a naturally occurring mineral found in rocks, soil and groundwater, and surface water. Manganese is necessary for proper nutrition and is part of a healthy diet, but can have undesirable effects on certain sensitive populations at elevated concentrations. The United States Environmental Protection Agency (EPA) and Mass DEP have set an aesthetics-based Secondary Maximum Contaminant Level (SMCL) for manganese of 50 ug/L (micrograms per liter), or 50 parts per billion. In addition, Mass DEP's Office of Research and Standards (ORS) has set a drinking water guideline for manganese (ORSG), which closely follows the EPA public health advisory for manganese. Drinking water may naturally have manganese and, when concentrations are greater than 50 µg/l, the water may be discolored and taste bad. Over a lifetime, the EPA recommends that people drink water with manganese levels less than 300 µg/l and over the short term, EPA recommends that people limit their consumption of water with levels over 1000 ug/l, primarily due to concerns about possible neurological effects. Children up to 1 year of age should not be given water with manganese concentrations over 300 ug/l, nor should formula for infants be made with that water for longer than 10 days. The ORSG differs from the EPA's health advisory because it expands the age group to which a lower manganese concentration applies from children less than 6 months of age to children up to 1 year of age to address concerns about children's susceptibility to manganese toxicity.

See: EPA Drinking Water Health Advisory for Manganese and Mass DEP Office of Research and Standards Guideline (ORSG) for Manganese. http://www.epa.gov/safewater/ccl/pdfs/reg_determine1/support_cc1_magnese_dwreport.pdf
<http://www.mass.gov/eea/agencies/massdep/water/drinking/manganese-in-drinking-water.html>

SODIUM: Sensitive individuals, such as those experiencing hypertension, kidney failure, or congestive heart failure, should be aware of the sodium levels where exposures are being carefully controlled. Rowley's water has an average of **73mg/l (last sampled 2015)**

UNREGULATED CONTAMINANTS are those for which there are no established drinking water standards. The purpose of unregulated contaminant monitoring is to assist regulatory agencies in determining their occurrence in drinking water and whether future regulation is warranted. US EPA has established a lifetime health advisory (HA) value of 300 ppb for manganese to protect against concerns of potential neurological effects, and a one-day and 10-day HA of 1000 ppb for acute exposure.

Hardness: Hardness in drinking water is defined as those minerals that dissolve in water having a positive electrical charge. The presence or absence of the hardness minerals in drinking water is not known to pose a health risk to users. Hardness is normally considered an aesthetic water quality factor. The presence of some dissolved mineral material in drinking water is typically what gives the water its characteristic and pleasant taste. The Town of Rowley has hardness of **100-140mg/l or 4.0 -5.0 grains per gallon**. For more information visit www.epa.gov

Hardness creates the following consumer problems:

- ✓ **Produces soap scum most noticeable on tubs and showers.**
- ✓ **Produces white mineral deposits on dishes more noticeable on clear glassware.**
- ✓ **Reduces the efficiency of devices that heat water. As hardness deposits build in thickness, they act like insulation, reducing the efficiency of heat transfer.**

Categorizing Hardness (mg/l)

Soft water	0-50
Moderately hard water	51-100
Hard water	101-150
Very hard water	151 and up



Pharmaceuticals and personal care products were first called "PPCPs" only a few years ago, but these bioactive chemicals (substances that have an effect on living tissue) have been around for decades. Their effect on the environment is now recognized as an important area of research. Some PPCPs are easily broken down and processed by the human body or degrade quickly in the environment, but others are not easily broken down and processed, so they enter septic systems and sewers. PPCPs dissolve easily and don't evaporate at normal temperatures or pressure, PPCPs make their way into the soil and into aquatic environments via sewage, treated sewage sludge (biosolids), and irrigation with reclaimed water. **DO NOT FLUSH DOWN SINK OR TOILET** The best and most cost-effective way to ensure safe water at the tap is to keep our source waters clean. Never flush unused medications down the toilet or sink. For disposal of non-liquid medications, call your local pharmacy where you bought them. Sources of PPCP's are: Human activity Residues from pharmaceutical manufacturing, Residues from hospitals, illicit drugs, veterinary drug use, especially antibiotics and steroids. PPCP examples are: Prescription and over-the counter drugs, Veterinary drugs Fragrances, Cosmetics, Sun-screen products, Diagnostic agents and nutraceuticals (e.g., vitamins).

Suggested water quality testing for private wells: If you have a private well, then water quality testing should be important to you and your family. Some contaminants in drinking water have been linked to cancer and toxicity, posing a risk to human health. Many contaminants often have no taste, odor, or color. Their presence can only be determined by laboratory testing. Well water originates as rain and snow that then filters into the ground. As it soaks through the soil, the water can dissolve materials that are present on or in the ground, becoming contaminated. Some contaminants are naturally occurring in soil and rock. These include contaminants such as bacteria, radon, arsenic, uranium, and other minerals. Other contaminants find their way onto the land from human activities. Industrial and commercial activities, improper waste disposal, road salting, and fuel spills can introduce hazardous substances to the ground. However, even typical residential activities, such as the use of fertilizers and pesticides, fueling of lawn equipment, and disposal of household chemicals, can contaminate the ground when done improperly. That is why taking measures to protect your well from contamination is so important. For more information visit www.epa.gov

Annual	Every 3 to 5 years
Arsenic Bacteria Sodium /Chloride Copper/copper Hardness Iron/Manganese Nitrate/Nitrite pH	Radon Uranium Gross Alpha Volatile organic compounds (VOCs)

Radon: is a radioactive gas that you cannot see, taste, or smell. It is found throughout the United States. Radon can move up through the ground and into a home through cracks and holes in the foundation. Radon can build up to high levels in all types of homes. Radon can also get into indoor air when released from tap water from showering, washing dishes, and other household activities. Compared to radon entering the home through soil, radon entering the home through tap water will be (in most cases) a small source of radon in indoor air. Radon is a known human carcinogen. Breathing air containing radon can lead to lung cancer. Drinking water containing radon may also cause increased risk of stomach cancer. If you are concerned about radon in your home, test the air in your home. Testing is inexpensive and easy. Fix your home if the level of radon in your air is 4 picocuries of radon per liter of air (pCi/l) or higher. There are simple ways to fix a radon problem that aren't too costly. For additional information, call Mass DEP radon program or call EPA's Radon Hotline @ 800.SOS.RADON."

Contaminants	Date	Average	Range Detected	Highest Result
Gross Alpha (pCi/L)	7/22/2014	0.35	0.33-0.82	0.82
Radium 226 (pCi/L)	7/22/2014	0.11	0.6-0.21	0.21
Radium 228 (pCi/L)	7/22/2014	0.51	0.04-1.13	1.13
Combined Radium pCi/L)	7/22/2014	0.68	0.17-1.2	1.20

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contamination. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline (1-800- 426-4791.)

2016 WATER QUALITY TEST RESULTS

The water quality information presented in the table(s) is from the most recent round of testing done in accordance with the regulations. All data shown was collected during the last calendar year unless otherwise noted in the table(s).

Abbreviations and Definitions:

Maximum Contaminant Level (MCL) – 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. **Maximum Contaminant Level Goal (MCLG)** –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. **Turbidity** is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system.

Maximum Residual Disinfectant Level (MRDL) -- The highest level of a disinfectant (chlorine, chloramines, chlorine dioxide) allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG) -- The level of a drinking water disinfectant (chlorine, chloramines, chlorine dioxide) below which there is no known or expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Treatment Technique (TT) – A required process intended to reduce the level of a contaminant in drinking water. **Action Level (AL)** – The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow. **90th Percentile** – Out of every 10 homes sampled, 9 were at or below this level. **Variances and Exemptions** – State or EPA permission not to meet an MCL or a treatment technique under certain conditions. **Secondary Maximum Contaminant Level (SMCL)** – These standards are developed to protect the aesthetic qualities of drinking water and are not health based.

Massachusetts Office of Research and Standards Guideline (ORSG) – This is the concentration of a chemical in drinking water, at or below which, adverse health effects are unlikely to occur after chronic (lifetime) exposure. If exceeded, it serves as an indicator of the potential need for further action. **Action Level:** The concentration of a contaminant that, if exceeded, triggers treatment or other requirements, which a water system must follow. **ppm** = parts per million, or milligrams per liter (mg/l) **ppb** = parts per billion, or micrograms per liter (ug/l) **ppt** = parts per trillion, or nanograms per liter **pCi/L** = picocuries per liter (a measure of radioactivity)

NTU = Nephelometric Turbidity Units **ND** = Not Detected **N/A** = Not Applicable **mrem/year** = milliremms per year (a measure of radiation absorbed by the body).

Contaminant	Date(s) Collected	Highest Result Detected	Range Detected	MCL or MRDL	MCLG or MRDLG	Violation (Y/N)	Possible Source(s) of Contamination
Volatile Organic Compounds							
Tetrachloroethylene (PCE) ppb	4/6/2016	0.94	0-0.94	5	0	NO	Discharge from factories and dry cleaners; residual of vinyl-lined water main. Some people who drink water containing tetrachloroethylene in excess of the MCL over many years could have problems with their liver, and may have an increased risk of getting cancer.

Contaminant	Date(s) Collected	Highest Result Detected	Range Detected	MCL or MRDL	MCLG or MRDLG	Violation (Y/N)	Possible Source(s) of Contamination
Unregulated Contaminants							
Chloroform	1/5/16	18	0-18	---	---	NO	By-product of drinking water chlorination
Bromodichloromethane	1/5/16	11	0-11	---	---	NO	By-product of drinking water chlorination
Chlorodibromomethane	1/5/16	3.5	0-3.5	---	---	NO	By-product of drinking water chlorination

Contaminant	Date(s) Collected	Highest Result Detected	Range Detected	MCL or MRDL	MCLG or MRDLG	Violation (Y/N)	Possible Source(s) of Contamination
Inorganic Contaminants							
Perchlorate ppb	10/6/16	ND	ND	2	NA	NO	Rocket propellants, fireworks, munitions, flares, blasting agents. Perchlorate interferes with the normal function of the thyroid gland and thus has the potential to affect growth and development, causing brain damage and other adverse effects, particularly in fetuses and infants. Pregnant women, the fetus, infants, children up to the age of 12, and people with a hypothyroid condition are particularly susceptible to perchlorate toxicity.
Nitrate ppm	4/5/16	1.2	0.40-1.2	10	10	NO	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits. Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome.

Here are some useful tips on how you can help protect your drinking water supply...

- Use non-toxic and less-toxic alternatives to household chemicals such as cleaners, oil-based paints, insecticides.
- Take leftover household chemicals to your community's household hazardous waste collection day.
- Take care of your septic system.
- Keep records of septic system maintenance.
- Inspect septic tank every year.
- Have tank pumped out every two to three years.
- Avoid damage to your leach field

Contaminant	Date(s) Collected	Highest Result Detected	Range Detected	MCL or MRDL	MCLG or MRDLG	Violation (Y/N)	Possible Source(s) of Contamination
Disinfectants and Disinfection By-Products							
Free Chlorine (ppm)	Weekly	0.96	0.43-0.96	4	4	NO	Water additive used to control microbes
Total Trihalomethane (TTHMs) (ppb)	8/3/16	19.0	3.7-19.0	80	-----	NO	Byproduct of drinking water chlorination. Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.
Total Haloacetic Acid (HAA5) (ppb)	8/3/16	8.3	1.5-8.3	60	-----	NO	Byproduct of drinking water disinfection

Contaminant	Date Collected	Average Detected	Result or Range Detected	SMCL	ORSG or Health Advisory	Violation Y/N	Possible Sources
Secondary Contaminants							
Chloride (ppm)	7/7/16	178	87-240	250	---	NO	Runoff from road de-icing, use of inorganic fertilizers, landfill leachates, septic tank effluents, animal feeds, industrial effluents, irrigation drainage, and seawater intrusion in coastal areas
Alkalinity AS CaCO3)	7/7/16	74.3	46-91	---	---	NO	Buffering capacity of water
pH (units)	7/7/16	7.45	7.3-7.6	6.5-8.5	---	NO	_____
Total dissolved solids (TDS)	7/7/16	383	230-500	500	---	NO	Erosion of natural deposits. May produce hardness; deposits; colored water; staining; salty taste
Zinc (ppm)	7/7/16	0.0095	0.006-0.2	5	---	NO	Erosion of natural deposits, leaching from plumbing materials. May produce a metallic taste
Turbidity (NTU)	7/7/16	0.018	ND-0.11	TT	TT	NO	Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.
Sulfate (ppm)	7/7/16	15.5	15-17	250	----	NO	Natural sources. May produce a salty taste
Calcium (ppm)	7/7/16	36.3	29-49	----	----	NO	_____
Magnesium (ppm)	7/7/16	8.23	6.4-10	----	----	NO	_____
Potassium (ppm)	7/7/16	3.2	3.2-3.3	----	----	NO	_____
Odor (TON)	7/7/16	0.028	0.0083-0.04	1	----	NO	Erosion of natural deposits; Leaching from wood preservatives