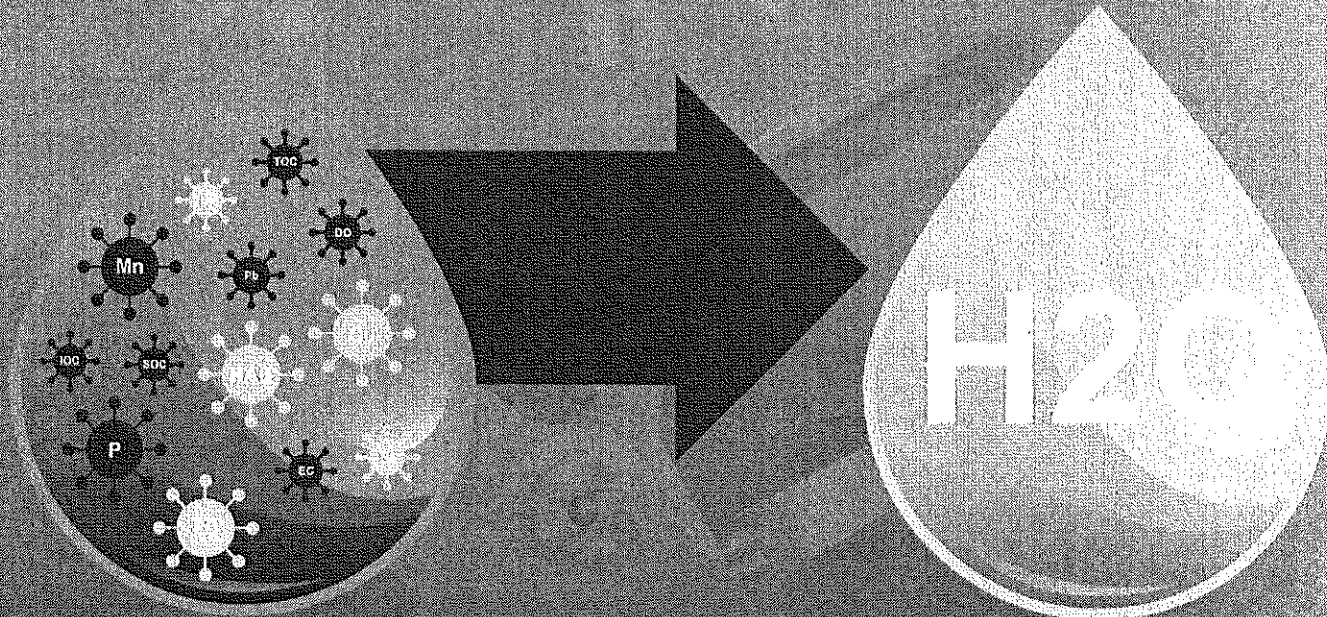


GROTON UTILITIES

2020

Annual Water Quality Report

New and Emerging CONTAMINANTS





Important Information About Your Drinking Water

Groton Utilities is proud to report that the water we supply meets all established Federal and State drinking water standards. During 2020 we received **NO** violations for water quality from our regulators. This **23rd Annual Water Quality Report** contains important information about the source and treatment of your water, lists the results of our 2020 testing, and includes some of the improvements we are making to enhance the quality of your drinking water. The report also contains information about what you can do to conserve and protect your valuable water supply.

Trust us, we know these can be confusing times regarding the environment in which we live. We hear and read about pollution in its many forms in air, water, food, and the earth itself. Sometimes, the pollutant list reads like a veritable vegetable soup. In precipitation, runoff and water bodies we hear about TOC, THM precursors, DO, Mn, Pb, Cu, HAB, SOC, IOC, PFAS, EDC, Rn, N, P, plastics, personal care products, FC, EC, Na and Cl, the list goes on and on.

We are here to supply you with the safest drinking water possible. We keep informed from State and Federal regulators, professional organizations, and through continuing education, which by the way is

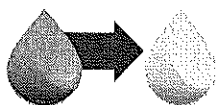
required of all our essential workers, who are all State licensed. Our Laboratory is State of Connecticut certified. For more sophisticated analyses we use State and Federally approved laboratories. Our water treatment facility is modern, and has been designed to remove or limit all present and emergent contaminants to established government standards.

In this year's Water Quality Report, we will review with you, our valued customers, the litany of emergent contaminants as well as contaminants of concern. Our goal is binary – we keep you informed of our diligent efforts to maintain and improve our drinking water quality, as well as protecting you, the environment, and homes and businesses in our service area, by supplying excellent water quality, and required fire protection capabilities.

Please read our report, stay informed, and never hesitate to contact us. For more information visit the Groton Utilities website at www.grotonutilities.com > [Our Company](#) > [Water Operations](#).

*Richard Stevens
Manager of Water, Groton Utilities*

The graphic design for this Water Quality Report was done by Jesse Carbone – Carbone Graphics.



Are Contaminants of Emerging Concern New?

Although the term “contaminants of emerging concern” is fairly recent, did you know that the concept of CECs has been around for thousands of years? Throughout many generations of civilization, people have sought to understand and eliminate causes of illness. We are hopefully coming to the end of a current pandemic caused by the SARS-CoV-2 coronavirus, but other organisms have been the cause of pandemics throughout the ages. One in particular, cholera, is a waterborne disease, caused by the bacterium *Vibrio cholerae*. There have been seven cholera pandemics identified over the past 3 centuries. There was a cholera outbreak in London in 1854 (part of the *third cholera pandemic*, 1846 – 1860), which Dr. John Snow (the Father of Modern Epidemiology) proved was caused by a contaminated well on Broad St.—he proved it by having the authorities remove the pump handle so no one could use that water, and the cholera cases went down rapidly. Although his work was not appreciated or widely believed in his day, since the germ theory of illness was not accepted at that time, his careful and thorough documentation was accepted as proof later on. Once germ theory was accepted and understood, it paved the way for a major breakthrough in the treatment of drinking water, with the use of chlorine for the purpose of disinfecting drinking water (which in the U.S. started in 1908).

With the introduction of the chlorination to drinking water treatment plants, cases of cholera, typhoid fever, dysentery, and hepatitis A, dropped dramatically where chlorine was in use, and now have been virtually eliminated in countries where drinking water chlorination is practiced. This is one of the great success stories of advances in drinking water treatment during the 20th century.

Contaminants of Emerging Concern

Ever since the Safe Drinking Water Act (SDWA) came into being in 1974, it has been recognized that the EPA was not regulating every possible thing that could end up in drinking water—but they had to start somewhere. In addition to regularly evaluating and revising the existing regulations, the EPA takes an overview of

contaminants which are not yet regulated, assess which ones potentially could be of most concern, and have water companies collect water samples from either their “raw” water (from reservoirs or wells, as the case may be), their Point of Entry water (the treated finished water, going out to their customers), or out in their distribution systems.

This on-going review takes place during a five-year period, and results (typically) in 3 years of water sampling and analyses of these samples from across the United States. The results are compiled and evaluated, and this leads to new contaminants being regulated in drinking water, or being rejected if they are not a significant health threat. This process includes evaluating how frequently they are found in drinking water (and in what amount), doing studies to determine what level of contamination may be harmful to humans, and what technologies are available to effectively remove the contaminants from drinking water.

Selection of contaminants can be based on new scientific research, which identifies these contaminants, it can be a result of water consumers being concerned about the possibility of certain compounds being present in the water, or it can be a combination of both. However these concerns are raised, they all fit under the category of Contaminants of Emerging Concern (CECs).

Some CECs are man-made such as PFAS (Perfluoroalkyl and polyfluoroalkyl substances, existing as non-stick chemicals, and coatings that make clothing water-repellant, to name a few uses), others are naturally-occurring such as cyanobacteria (previously known as blue-green algae) which can sometimes produce toxins—but they all have several things in common. They are either found in some raw water sources (water, before it is treated to become drinking water), or there is a concern that they could be found in them someday. Also, it is either known that they can cause health issues for humans, or it is suspected that they could cause health issues (although in cases of suspected contaminants, it can be a long process to demonstrate whether they cause harm in humans, and to determine the short-term and/or long-term harm at various levels of contamination).





PFAS

One type of CEC is PFAS (per- and polyfluoroalkyl substances). As concern about PFAS in source water and drinking water around Connecticut has increased, Groton Utilities has proactively begun sampling in our terminal reservoir (Poquonnock Reservoir), at our Point of Entry (the treated water leaving the water plant to go to our customers), and within our watershed. Even though there is no current Maximum Contaminant Level (MCL) established (work is underway at the EPA to make a science-based evaluation to determine an MCL for the PFAS compounds of greatest concern), the Connecticut Department of Public Health has established a Health Advisory for five PFAS compounds, not to exceed 70 parts per trillion, individually or combined. Our testing so far has shown that all Groton Utilities drinking water is well below the current health advisory. For more on PFAS see the last page, and also check our on-line platforms for further information.

Cyanobacteria

Another CEC is cyanobacteria (once known as blue green algae); certain strains of cyanobacteria are capable of producing toxins (called cyanotoxins) within their cells. Even though capable of producing cyanotoxins, these strains of cyanobacteria do not always produce them, and scientists are working to understand when and why they will or will not produce cyanotoxins. A bloom of cyanobacteria, similar to an algae bloom, creates the conditions for cyanotoxins to be released (if they are present). They will be released if the cyanobacteria cells are torn open ("lysed," in scientific terms). To date, Groton Utilities has not experienced a cyanobacteria bloom in our reservoirs, and we have retained the services of a consulting firm for

many years (a limnologist), in an effort to keep our reservoirs in the best condition possible.

One of the major improvements in our new water treatment plant, put in service in November 2020, was the addition of Dissolved Air Flotation (DAF). After raw water comes into the plant and a coagulant is added to get small particles of dirt to stick together ("floc"), it passes into a large tank where dissolved microbubbles float the floc up to the top of the water, where they are skimmed off and removed from the treatment process. This is particularly advantageous for buoyant cyanobacteria, which will be floated up to the top and skimmed off with the floc, were we to have a cyanobacteria bloom. In this way the cyanobacteria would be removed without tearing open the cells and releasing any toxins which might be present.

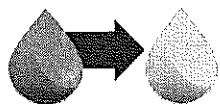
Disinfection By-Products

Chemical compounds, formed by the reaction of chlorine in contact with natural organic matter, were discovered by EPA scientists in the 1970s (CECs, for that time) and subsequently regulated by the EPA beginning in 1979; they are referred to as Disinfection By-Products (DBPs). The two types of these compounds are known as Trihalomethanes (THMs) and Haloacetic acids (HAA5s). However, their presence, despite dedicated efforts by water companies to minimize their occurrence, does not outweigh the benefits of chlorine as noted above (see **Are CECs New?**, final paragraph). A report on chlorination of drinking water by the International Programme on Chemical Safety (as quoted in a document on chlorination posted by the Water Quality and Health Council, <https://waterand-health.org/safe-drinking-water/wp/>) states the following:

The health risks from these byproducts at the levels at which they occur in drinking water are extremely small in comparison with the risks associated with inadequate disinfection. Thus, it is important that disinfection not be compromised in attempting to control such byproducts.

This is always the challenge in all attempts to produce safe drinking water—we always work to improve drinking water quality, while working at the same time to minimize any unintended consequences.

We here at Groton Utilities take seriously our commitment to provide our customers with the best drinking



water possible; that is why we recently built a new water treatment plant with improvements such as Dissolved Air Flotation and deep-bed Granular Activated Carbon (a filter media that provides added benefits compared to the rapid sand media we previously used).

Sodium in Drinking Water

Although not a CEC, sodium is an element that is naturally occurring and is essential for life. Sodium is naturally present in our reservoirs, and in some of our reservoirs it is at a higher level than others, possibly due to stormwater runoff from the roads. At various times, ranging from the spring to the fall, it is advantageous to blend water from one of our reservoirs into our main reservoir to improve certain aspects of the water quality. Unfortunately, that reservoir is one of the ones which has a higher sodium content and this will sometimes cause our tap water to have sodium in excess of the 28 mg/L notification level (our maximum level last year was 31 mg/L). As required, we published a notice in our billing statements to let our customers know this. For most of our customers, this will not be an issue, but for customers who have been put on a very restrictive diet (less than 500 mg of sodium per day) this may be something they will want to discuss with their doctor. To put things in perspective, 31 mg/L of sodium is equal to 7.3 mg of sodium in an 8 ounce glass of water; in comparison, an 8 ounce glass of 1 % milk contains 104 mg of sodium. So if you have any concerns about sodium in drinking water please consult your physician, but for most people on a normal (i.e., non-sodium restricted) diet it would not be of concern.

Corrosion Control in Drinking Water

As one of the many things we do to provide you with the best drinking water quality possible, we add a corrosion inhibitor to the drinking water. The purpose is to keep lead and copper in one's household plumbing from dissolving into the tap water when water is not in use (overnight, or during other extended periods of non-use). We use a blended phosphate—an ortho phosphate and a polyphosphate: the ortho phosphate keeps the lead and copper from coming into solution in household piping, and the poly phosphate acts to bind with minerals such as iron and manganese that may be in the water, to prevent "red water" issues. To be clear, there is no lead or copper in the water coming from our reservoirs, the purpose



of the corrosion inhibitor is just to restrict the natural tendency of water (known as the "universal solvent") to dissolve metal plumbing materials into the tap water. As with all the treatment in use at our water treatment plant, this blended phosphate is approved specifically for use in potable water, in a dosage approved by the Connecticut Department of Public Health, Drinking Water Section.

Important Information about Lead and Copper in Drinking Water

Due to watershed protection measures and an active program to control corrosion in water pipes, our water system has remained in compliance with drinking water regulations. However, it is possible that lead or copper levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Infants and children who drink water containing lead in excess of the action level could experience delays in their physical or mental development. Children could show slight deficits in attention span and learning abilities. Adults who drink water containing lead in excess of the action level over many years could develop kidney problems or high blood pressure.



Copper is an essential nutrient, but some people who drink water containing copper in excess of the action level over a relatively short amount of time could experience gastrointestinal distress. Some people who drink water containing copper in excess of the action level over many years could suffer liver or kidney damage. People with Wilson's disease should consult their personal doctor.

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

Following are steps that can be taken to minimize potential exposure to lead:

✓ If the water has sat unused in your pipes for more than several hours, flush your cold water tap for a few minutes (or until it gets cold) before using for drinking, cooking or making baby formula.

✓ Use cold water (not water from the hot water tap) for drinking, cooking, making formula, hot cocoa, tea, instant foods, etc.

✓ Periodically remove and clean the aerator or screen from the end of each faucet and rinse to remove any debris.

✓ Ensure that any updates to household plumbing are done with lead-free solder and fixtures.

If you are concerned about lead or copper 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 (800-426-4791) or at <https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water>.

Source Water

One of the best ways to protect our customers from CECs is to be vigilant in monitoring the water sources within our watershed. Groton Utilities' water is supplied by surface water from a series of five interconnected reservoirs covering a watershed of 15.6 miles, and also includes three wells.

Four reservoirs –Morgan, Ledyard, Poheganut, and Smith Lake flow into Poquonnock, our terminal reservoir. When full, all five reservoirs have a combined capacity of 2.5 billion gallons of water. Planning for the future, we invested funds in 2014 to secure water rights from Haley's Brook in Groton, and have advised local and state agencies to ensure that the immediate watershed area will receive protection status. Our staff includes reservoir patrol staff who, with local and state police, maintain a high level of security, monitor the watershed for potential sources of contamination, and routinely collect water samples for laboratory analysis. We also have a spill response team and trailer to assist emergency responders with any threat of contamination that could impact our water supply. Maintaining the security of our water supply is everyone's responsibility. Please advise us of any suspicious activity by calling us at (860) 446-4000.

Source Water Assessment

The State of Connecticut Department of Public Health has performed an assessment of our drinking water sources. It was found that Groton Utilities' drinking water sources have an overall low susceptibility to potential sources of contamination. The completed report is available for access on the Drinking Water Division's website: <https://portal.ct.gov/dph>. Click on Topics A-Z, Drinking Water, Drinking Water Topics A-Z, and then Source Water Assessment Program.

Forestry

Watershed land owned by GU surrounding the reservoirs is made up of forests and wetlands. Forests are one of the first and best defense mechanisms to achieve high water quality filtering and purifying the water. These areas improve water quality through water filtration, reduction of stormwater run-off and natural removal of contaminants. Healthy diverse forests provide important water treatment services even before the water reaches the water treatment plant. To ensure the continued production of clean water, GU worked with a Certified Connecticut Forester to develop a long term Forestry Management Plan in 2019. Having diverse and healthy stands of trees makes the forest more resilient and better able to continue



acting as a filter for our reservoirs. Properly managing forests for water quality also helps prevent damage from insect pests, invasive species and limits vulnerability to fire and other disturbances.

Land Protection

Groton Utilities works with local and state environmental and conservation groups in support of their efforts of watershed land and aquifer protection with the aim of protecting water quality, preserving forest land and wildlife habitat, and allowing for open space activities.

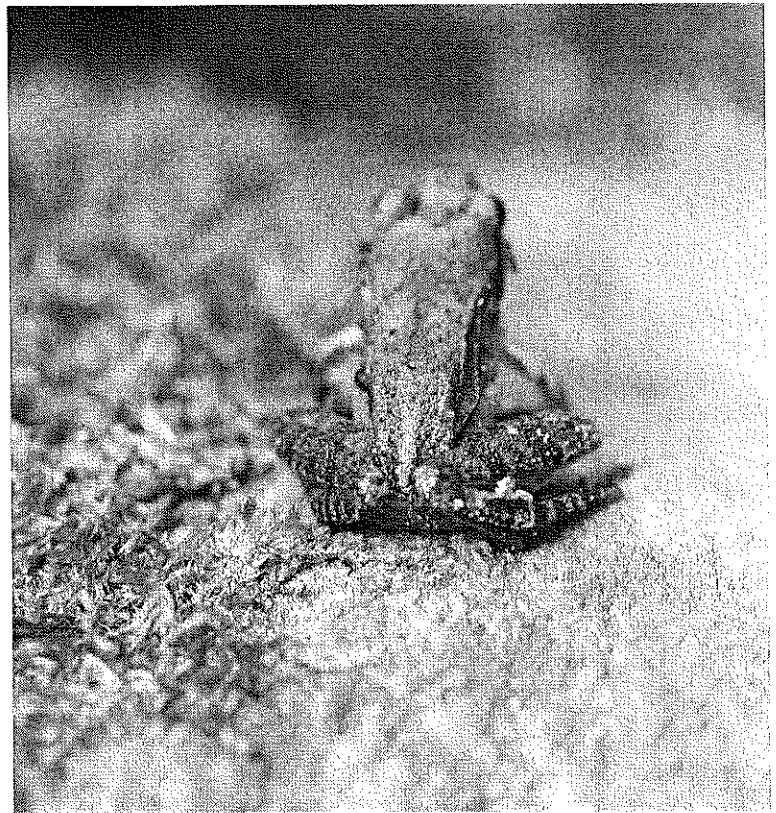
In 2019, Groton Utilities partnered with to Avalonia Land Conservancy in the group's protection and purchase of watershed land in Ledyard. Avalonia's new property, Atkinson-Dirlam Preserve on Long Cove Road, protects critical watershed land and wetlands that provide water treatment services. Additionally, Groton Utilities is working in partnership with Avalonia to provide watershed access and education through hikes on this newly acquired property.

Watershed Protection

Watershed and reservoir security is a key element of the Groton Utilities goal to provide clean potable water to customers and the region. The sources of our water include streams, ponds, springs, wells and of course our reservoirs. There are many key elements for this goal including flow control, inspections, sampling, surveillance and patrol. To maintain this protection program, our employees and vehicles clearly marked Groton Utilities can be seen in all areas of the watershed.

Emergency Response

Groton Utilities maintains an emergency response trailer stocked with absorbent materials and spill containment equipment. A team of employees have been recently re-certified to respond in case of emergency to assist first responders. Protocol and mutual aid agreements are in place with local fire and emergency services and a collaborative of Connecticut's Water/Wastewater Agency Response Network – CtWARN. Groton Utilities maintains an oil boom and turbidity curtains in key locations in reservoirs as part of water quality control for turbidity and spill protection.



(Photo by Julie DuPont-Woody)

How You Can Help to Protect Your Source Water Quality

- Don't flush medications or over-the-counter products down the toilet or sink. Put them in the trash (and not in the recycling bin). For information on safely disposing them in the trash, visit the CT DEEP's website at www.ct.gov/deep. Under Environmental Quality, click on Pollution Prevention; and then Proper Medication Disposal.
- Go Green – Seek alternatives to caustic household cleaners, pesticides, paint removers, and other products containing toxic chemicals. Go to the CT DEEP's website at www.ct.gov/deep. Under Environmental Quality, click on Pollution Prevention; and then Reducing Toxic Products in the Home. Alternative "recipes" (as well as other helpful tips) are given for many toxic products commonly used in the house and garden.
- Properly dispose of paints, motor oil, pesticides and other hazardous household waste by bringing it to a household hazardous waste collection site. Visit <http://scrarra.org> and under Discover SCRARRA (left column) click on "Household Hazardous Waste" for a complete list of Household Hazardous Waste collection days in 2021.





GU emergency response trailer.

Water Treatment

Our certified water treatment plant operators are responsible for producing water that meets all State and Federal drinking water requirements. In addition to routine plant operations, they also maintain and repair the numerous pumps and valves in the plant and the five pumping stations located in the distribution system. Performing routine maintenance throughout the Water Treatment Plant, and maintaining on-line monitoring equipment and the operational readiness of the emergency generators, are just a few examples of duties routinely performed.

Our original water plant was constructed in 1939 and had been periodically upgraded to meet regulatory requirements. The water was treated through a process termed "conventional treatment," which consists of coagulation, flocculation, sedimentation and filtration. Chlorine dioxide was sometimes added during the summer months to help remove iron and manganese. In the new WTP, put in service in November 2020, our conventional treatment now consists of coagulation, flocculation, Dissolved Air Flotation, and filtration through deep-bed Granular Activated Carbon filter media. Caustic soda and phosphate are added to inhibit corrosion of plumbing. Chlorine is added for disinfection and to maintain the quality of water as it travels throughout the piping network to your home. Fluoride is added to reduce the formation of cavities, as required by State of Connecticut Public Health regulations. In 2020, the water treatment plant produced an average of 5.1 million gallons a day and delivered water to approximately 44,000 customers in the City and Town of Groton, Noank, Groton Long Point, and parts of Ledyard, Montville, and Mystic.

Distribution Operations

Our certified water distribution operators are responsi-

ble for maintaining and servicing over 100 miles of water mains in Groton. One of their duties is fire hydrant maintenance, which ensures an adequate supply of water in the event of a fire. They also exercise valves, repair and replace mains to ensure an adequate supply of water to your home or business, and flush hydrants. Hydrants are flushed in the spring to maintain water quality and remove any rust or sediments which have accumulated throughout the year. **If discoloration occurs, run the cold water for 15 or 20 minutes until it clears. If it persists, call us at (860) 446-4000.**

Did you know that?

All of our operators have the highest grade of certification possible, as required by the CT Department of Public Health. They are also required to take continuing education courses to maintain their certification.

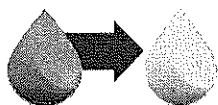
Project Management

Our project managers' responsibilities include overseeing new main construction and repair, as well as water treatment plant modifications. They also maintain all records digitally, pertaining to the location, type, and age of all pipes, valves, and equipment in the distribution system. This data is used to update the Groton Utilities asset management plan; Call Before You Dig is also an important function of Project Management.

Did you know that you should Call Before You Dig (811 or 1-800-922-4455) at least two full working days prior to any home improvement project requiring digging? You will get your underground utilities marked out for free, avoiding possible physical harm, fines, and repair costs for any damaged utility line. Visit their website at <https://www.cbyd.com> for more information.

Customer Service

Our customer service representatives are dedicated to provide you with personalized customer service. Call them at (860) 446-4000 or stop in at the office, located at 295 Meridian Street. Whether by telephone or in person, they will assist you with your service needs, answer questions, and respond to problems or concerns that you may have. *During the COVID-19 pandemic the office was closed to customer visits, so please call ahead to see if our office will be open to customer traffic.* Office Hours of operation (when open



to the public) are: Monday through Wednesday and Friday from 8:00 AM to 5:00 PM; Thursday from 8:00 AM to 7:00 PM and Saturday from 8:00 AM to noon. The office is closed on holidays. Emergency or after hour calls are also answered at (860) 446-4000.

Water Quality / System Improvements

As noted earlier, after years of planning and preparation we have upgraded our water treatment plant. We will also continue to work to improve the water quality and reliability of our water supply prior to treatment and after the water enters the distribution system. This includes water main replacement where needed, and upgrades to our standpipe operations to maintain the freshness of our water, as well as hydrant flushing and other routine maintenance operations.

Regional Water

Groton Utilities continues to improve its services to ensure the best water quality and required quantity of water be delivered to our customers in Groton, Mystic, Ledyard, Noank, Groton Long Point, Montville, Mohegan Tribe, and available for other regional interconnected customers—New London, East Lyme, Waterford, and Norwich.

Community Involvement

Groton Utilities conducts water plant tours to educate students and the public about our operations, water conservation, and source water protection. Additionally, classroom presentations, mentoring, job shadowing, and internship opportunities are made available. Pre-covid, we also conducted escorted tours in the watershed for various groups for educational, environmental and other supervised activities. These groups include, but are not limited to Ledyard and Groton residents, the Audubon Society for its annual bird count, Denison Pequotsepos Nature Center, GOSA and local schools for research purposes. Groton Utilities is also a member of the Greater Mystic Chamber of Commerce and the Eastern Connecticut Chamber of Commerce. *Tours and interactive activities have been curtailed during the recent COVID-19 pandemic.*

Water Quality Testing

Groton Utilities maintains a State-certified laboratory

(CT License #PH-0409) where the majority of our water analyses are conducted. During the year, samples are collected from the source water before treatment, during the various stages in the treatment process, and throughout the distribution system. Tests for bacteria, physical qualities, various organic and inorganic compounds, and pesticides and herbicides are conducted.

To ensure that tap water is safe to drink, EPA prescribes limits on the amounts of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

The table on the last page of this report lists only the contaminants that were found in our drinking water in 2020. All levels found were less than the maximum level allowed by the EPA and CT Department of Public Health. The table does not list the more than 60 contaminants that were tested for, but were not present in our water. You will also note that some of the results, though representative, were from samples collected prior to 2020. That is because the CT Department of Public Health allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently.

Any water quality concerns, questions or requests for more information can be submitted via e-mail to waterquality@grotonutilities.com or can be phoned in directly to our lab at (860) 446-4135 during normal business hours (Monday – Friday, 7:00 am – 3:00 pm). *For emergency or after hour calls for assistance, please call (860) 446-4000.*

Sources of Drinking Water Contaminants

The sources of drinking water (both tap 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 radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Following are some examples of such contaminants:

- Microbiological contaminants such as viruses and bacteria, which may come from septic systems, agriculture and livestock operations, and wildlife;



CONTAMINANTS
NOT A MSIC

- Inorganic contaminants, such as salts and metals that can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, or farming;
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses;
- Organic chemicals, including synthetic and volatile organic compounds which are byproducts of industrial processes, and can come from gas stations, urban storm water runoff, and septic systems;
- Radioactive contaminants that can be naturally occurring.

Health Effects Information

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

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers.

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

Water Conservation Tips

- Fix leaky faucets, showerheads and toilets.
- Consider replacing older toilets with a

WaterSense labeled high efficiency toilet. These must pass rigorous performance criteria and can't use more than 1.28 gallons per flush in order to earn the WaterSense label (older toilets can use up to four times more water than WaterSense toilets).

- Install aerators on your faucets. They reduce the flow and use air to maintain good water pressure (and remember to periodically remove and clean faucet aerators because they can trap debris).
- Take shorter showers. High efficiency WaterSense showerheads automatically use less water without compromising the quality of your shower.
- Consider replacing your old washing machine with a high-efficiency Energy Star labeled model, which uses up to 50% less water and electricity.
- Run the dishwasher and washing machine only when full.
- Don't over-water your lawn or garden – use a timer, and water early in the morning or at night to avoid excess evaporation.
- Clean your sidewalk or driveway with a broom instead of a hose.

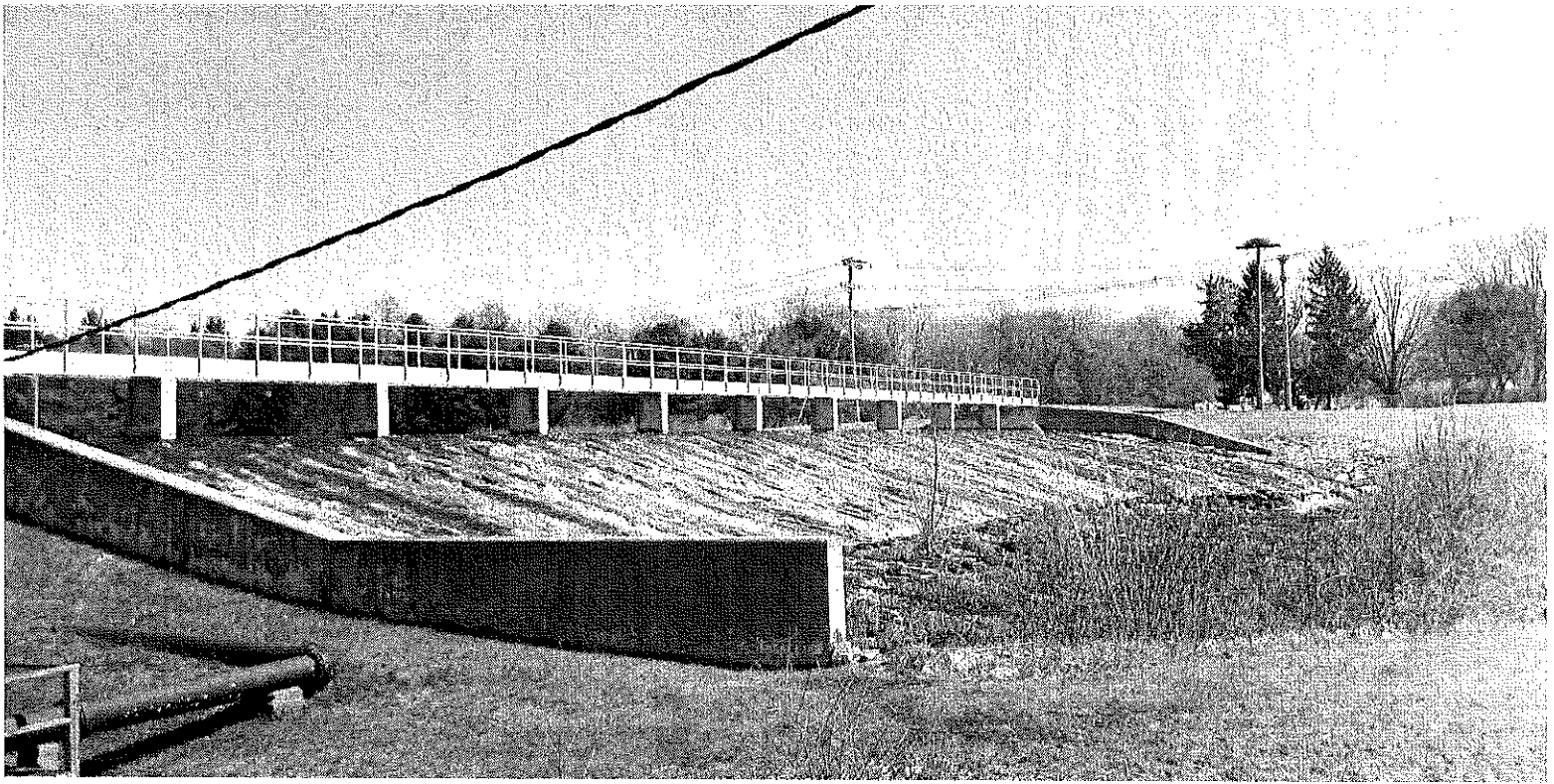
There is a strong commitment by Groton Utilities, the local community, state regulators, and public health professionals to protect Connecticut's drinking water supplies and inform consumers about water quality issues.

For more information, call us at (860) 446-4000. We provide 24 hour a day service and emergency response.

The Utility Commission, our policy making body, meets regularly at 10:30 AM on the 3rd Wednesday of each month in Council Chambers at 295 Meridian Street, Groton. *During the COVID-19 pandemic, all meetings are virtual.*

Learn more about the Groton Utilities water system at: www.grotonutilities.com





Poquonnock Reservoir Spillway

Contaminants, and How We Measure Them

Now that we have discussed Contaminants of Emerging Concern, as well as other topics related to drinking water, we would do well to discuss the ways we describe or measure the quantity of contaminants present in a water sample. When we measure the amount of something in water, we describe it in terms of parts per million, or smaller measurements of parts per billion, and even smaller measurements of parts per trillion. What do parts per million, parts per billion, and parts per trillion even mean?

If you hit the lotto for \$10,000 (one million pennies), and lost one penny of it as you left Lotto headquarters – that's one part per million (1 ppm).

If you won 10 million dollars, and the bank made a one-cent error when you deposited it, that's one part per billion (1 ppb).

And finally, if you hit one of the multi-state lotteries for 10 billion dollars and gave one cent of it to your favorite aunt, she would have one part per trillion (1 ppt) of your fortune.

To briefly state this:

One part per million = 1 penny in \$10,000
One part per billion = 1 penny in \$10,000,000

(1 penny in 10 million dollars)
One part per trillion = 1 penny in \$10,000,000,000
(1 penny in 10 billion dollars)

Just as there are different words we can use that mean the same thing, in water science different words mean the same thing.

One part per million (1 ppm) means the same thing as one milligram per liter (1 mg/L);

One part per billion (1 ppb) means the same thing as one microgram per liter (1 ug/L);

One part per trillion (1 ppt) means the same thing as one nanogram per liter (1 ng/L)

So if we say there are 31 mg/L of sodium in the water that means the same thing as if we said there are 31 ppm of sodium in the water, and is the same as saying 31 pennies in \$10,000 (to use our original comparison).

Now that we have discussed how we measure very small quantities of things, please take a look at our data table for Groton Water in 2020, which lists data using the measurements we just explained, and compares them to the maximum amount allowed in drinking water (the Maximum Contaminant Level, or MCL).



GROTON UTILITIES 2020 ANNUAL WATER QUALITY DATA

Regulated Contaminants Highest Level Allowed Groton Water

Parameter	Units	MCL	MCLG	Highest Detected Level	Range (a)	Major Source	Meets Standards?
Barium	ppm	2	2	0.009	—	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits	YES
Chloride	ppm	250	N/A	44	28 - 44	Stormwater runoff containing road salt, erosion of natural deposits	YES
Fluoride	ppm	4	4	0.94	0.23 - 0.94	Erosion of natural deposits; water additive which promotes strong teeth	YES
Nitrate	ppm	10	10	0.31	0.02 - 0.31	Runoff from fertilizer use, leachate from septic tanks; sewage, erosion of natural deposits	YES
Total Coliform Bacteria	P/A	Presence not to exceed 5% of monthly samples	0%	0.0%	0.0%	Naturally present in the environment	YES
Parameter	Units	TT	MCLG	Lowest RAA	Range	Major Source	Meets Standards?
Total Organic Carbon	N/A	Removal ratio must be >=1.00	N/A	1.5	1.5 - 1.7	Naturally present in the environment	YES
Parameter	Units	TT	MCLG	Highest Detected Level	Lowest % of samples meeting limit	Major Source	Meets Standards?
Turbidity (NTU)	(b)	95% of samples must be <=0.3 NTU	N/A	0.38	99%	Soil runoff	YES
Parameter	Units	Action Level	MCLG	90th percentile (c)	# of sites above AL	Major Source	Meets Standards?
Lead	ppb	15	0	7	2 of 122	Corrosion of household plumbing systems; erosion of natural deposits	YES
Copper	ppm	1.3	1.3	0.08	0 of 122	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives	YES
Parameter	Units	MCL	MCLG	Highest LRAA (d)	Range	Major Source	Meets Standards?
Haloacetic Acids	ppb	60	N/A	31.5	15.4 - 34.9	By-product of drinking water disinfection	YES
Total Trihalomethanes	ppb	80	N/A	64.3	26.4 - 70.2	By-product of drinking water disinfection	YES
Parameter	Units	MRDL	MRDLG	Highest RAA	Range	Major Source	Meets Standards?
Chlorine	ppm	4	4	1.42	0.17 - 2.08	Water additive used to control microbes	YES

Unregulated Contaminants (e)

Parameter	Units	MCL	MCLG	Average	Range	Major Source	Meets Standards?
Sodium	ppm	Notification level = 28	None	22	18 - 31	Stormwater runoff containing road salt, erosion of natural deposits	N/A
Sulfate	ppm	None	None	6	5 - 6	Naturally occurring	N/A
Parameter	Units	MCL	MCLG	Highest	Range	Major Source	Meets Standards?
PFAS 5, combined	ppt	None, HA < 70	None	4	ND < 2 - 4	Man-made, used in manufacturing of consumer products, as well as in some types of fire-fighting foams	N/A

Notes

Only detected contaminants are listed in this table. Analyses were performed in 2020 unless noted otherwise.

(a) A range of values is not presented for those parameters which were measured only once in 2020.

(b) Turbidity is a measure of the cloudiness of water and is a good indicator of the effectiveness of our filtration system. Turbidity cannot exceed 1 NTU.

(c) Of the 122 homes tested in 2020, 90% had lead levels below 7 ppb, and 90% had copper below 0.08 ppm; since these values are below their respective Action Levels, our system is in compliance. Next analysis is due in 2021.

(d) Highest Locational Running Annual Average (LRAA) of samples taken in the distribution system. Values in the range are individual sample results.

(e) EPA has not established drinking water standards for unregulated contaminants. We are required to monitor for them to assist the EPA in determining their occurrence and whether future regulation is warranted.

(f) EPA has not established drinking water MCLs for Per- and Polyfluoralkyl Substances (PFAS), but Connecticut has established a health advisory (HA) for 5 of these compounds of less than 70 parts per trillion (ppt). These compounds are present in nonstick cookware, water- and stain-resistant textiles, cleaners, waxes, and some fire-fighting foams, among other things. Please see earlier in our water report for more information.

Key to Table

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.

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. (MCLs are set as close to the MCLGs as feasible using best available technology.)

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 contamination.

N/A = Not Applicable

ND = Not Detected

NTU = Nephelometric Turbidity Units

< = Less than

> = Greater than

ppm = parts per million

ppb = parts per billion

pCi/L = picoCuries per liter

P/A = presence / absence

RAA = Running Annual Average

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

SODIUM