Tewksbury Water Department
2015 Consumer Confidence Report
Water System ID#: 3295000

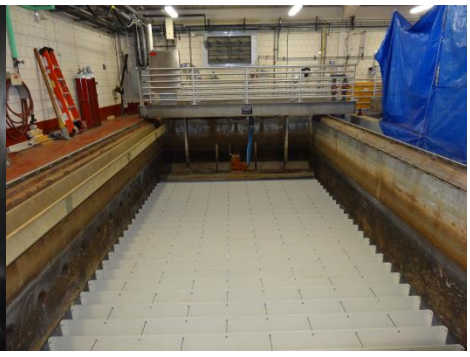
This report details information such as water quality, where your water comes from and how it is processed. More information on your water system can be found at: http://www.tewksbury-ma.gov/water-treatment-plant or /water-sewer-division

Water Billing: (978) 640-4350 (please have your bill or account number ready)
Water Treatment Plant: Lewis Zediana (978) 858-0345 or Lzediana@tewksbury-ma.gov
Water/Sewer: Robert Belida (978) 640-4440 ext. 5 or Rbelida@tewksbury-ma.gov

Why am I receiving this report? This report is mandated by the Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MaDEP). Much of this report consists of required language which may or may not be relevant to the Tewksbury Water System. Please feel free to contact the Treatment Plant for further clarification. If English is not your first language please have this report translated.
Si Ingles no es su primer idioma, por favor traduzca el informe.

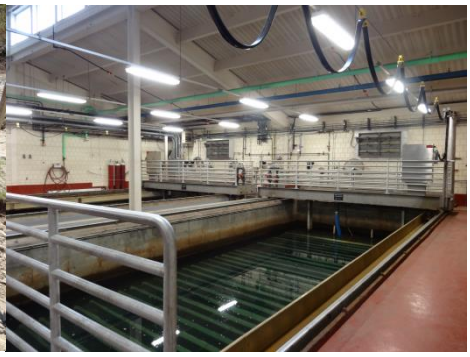
As part of an 18 month refurbishment project our entire facility will be renovated, added to and updated.





Above: Interior picture of our new 1 Megawatt (1600 HP) generator; The start of the foundation for our new 72,000 gallon sludge storage tank; Filter #1 after all of the interior parts were replaced and renovated, ready for another 30 years.
Below: The new generator is hoisted into position; pipes are installed on a new underground vault to measure water flow; Filter #1 & #2, all renovated and back in operation 3 weeks ahead of schedule. Each filter is filled with 20,000 pounds of special filter sand mined only in Connecticut and topped with 40,000 pounds of granulated activated carbon.





Goto: http://www.tewksbury-ma.gov/department-of-public-works/pages/current-construction-projects to see more photos

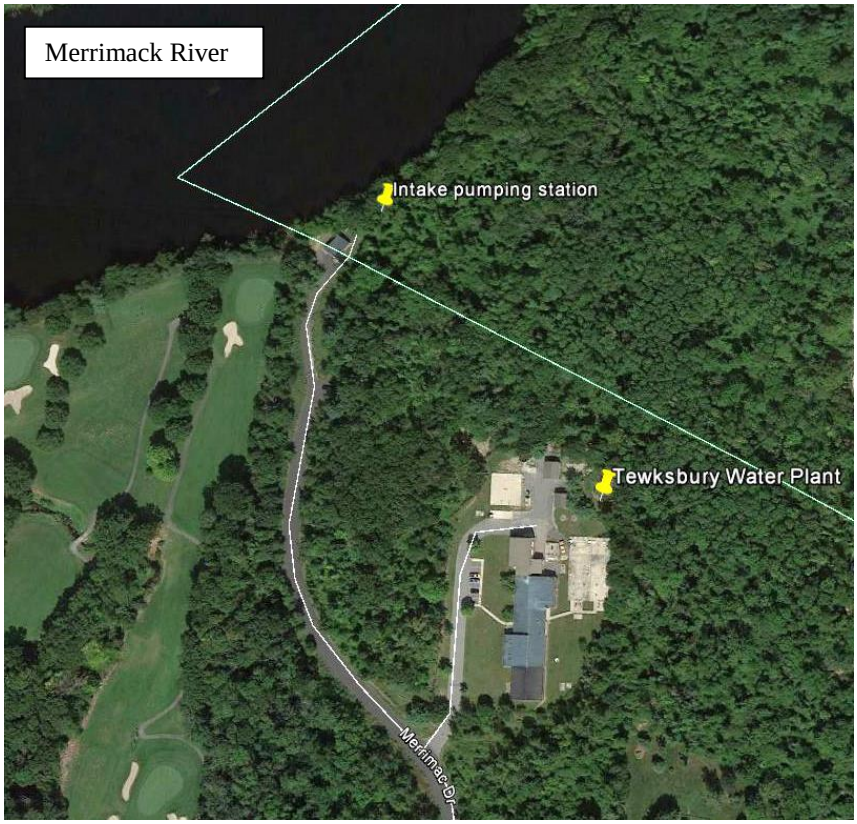
Water Flow Statistics for 2015

Total Volume of Water Pumped: 834.8 Million gallons.
Maximum day pumped (7/18/15) 3.30 Million gallons.
Residential gallons per capita day: 52 rgpcd
Unaccounted for water: 10.4 %

Residential Volume: 546.643 Million gallons
Commercial Volume: 150.624 Million gallons
Municipal Volume: 12.960 Million gallons
Flushing Program: 12.744 Million gallons

Where does my Water Come From?

Source Water: Merrimack River



The Merrimack River covers over 4,672 square miles between the States of New Hampshire and Massachusetts. The Merrimack River actually starts at Weirs Beach, Lake Winnipesauke. Because of the large recharge area the Merrimack River has a very large capacity to supply water even during extended droughts.

Over the last 28 years the river has undergone a tremendous change as far as water quality is concerned. Upstream wastewater plants installed in the late 1980's and elimination of hidden outfalls has contributed to the "B" classification of the river water.

To the left is the Tewksbury Water Treatment Plant. Our intake station is directly alongside the river and is designed to survive flooding up to six feet above the embankments. The building is actually built as a solid piece of concrete and goes two stories below the ground. Intake screens located on the bottom of the river draw water in while 1/8" slots prevent any debris from entering the waterworks.

How is my water treated?

The water plant is considered a "conventional" treatment facility. The water is treated in multiple stages called unit processes. The idea is that any one or more unit process can fail and still produce potable drinking water.

Screening: As mentioned above 1/8" slotted screens are used to prevent any damaging debris from entering the treatment stream. The screens are made of stainless steel and are inspect and cleaned every few years using construction divers. Compressed air is used to keep the screens cleared of any settling debris. Yes, they are fish friendly and approved by Fish and Wildlife to insure that fish will not be trapped by the screens.
Disinfection: Chlorine Dioxide and Bleach are used to disinfect the water and to help remove color and other organic components. Actually Chlorine Dioxide by itself achieves a near100% kill of all bacteria, but the water is then disinfected two more times using bleach.
Coagulation: Coagulation is a process whereby ALUM is added to the water to produce a sticky material referred to as "floc". Sticky floc surrounds all particles and causes them to easily settle out via the sedimentation process. This produces clarified water that is then filtered in the next unit process.
Filtration: Clarified water is fed into one of four dual media filters. These filters have granulated activated carbon (GAC) and fine filter sand. The GAC removes any remaining particles and absorbs any remaining organic compounds including taste and odor contaminants. The sand acts as a secondary barrier to make sure no microscopic particles can penetrate the filter. As a result Tewksbury water is typically crystal clear. All filters are cleaned once a day by backwashing and the GAC is replaced every two years well before the activation is exhausted.
Final Treatment: The final treatment consists of adding Sodium Hydroxide to adjust the pH of the water, a final dose of Bleach, Fluoride for tooth decay prevention and Zinc Ortho Phosphate to prevent pipe corrosion and reduce any lead or copper from dissolving into the water.

Analytical Results of Testing for 2015

Inorganic Analysis

Contaminant	Highest Level	Range Detected	Average Detected	MCL MRDL	MCLG MRDL G	Violation Y/N	Possible Source
Perchlorate (PPB)	0.36	N/A	0.36	2	0	N	Oxygen additive for solid fuel rockets & missiles; Industrial waste.
Fluoride (PPM)	1.20	0.70-1.20	0.80	4	4	N	Water additive which promotes strong teeth
Sodium (PPM)	28	N/A	28	N/A	N/A	N	Natural sources; runoff from salt used on roadways; by-product of treatment process
Nitrate (PPM)	0.40	N/A	0.40	10	10	N	Runoff from fertilizer use; leaching from septic tanks; erosion of natural deposits
Sulfates (PPM)	19	N/A	19	N/A	N/A	N	Soil runoff and detergents; by-product from treatment process
Chlorite (PPM)	0.46	0.01-0.46	0.20	1	N/A	N	Disinfection by-product

- Perchlorate is found in nature from various sources such as industrial waste, fireworks, improperly disposed of solid rocket fuel and is also found in old bleach. Perchlorate is very stable and hard to remove from water. The value above is barely above the detection limit of the method (0.1 PPB). Massachusetts has the lowest MCL in the nation of 2 PPB.
- Fluoride is added to the water to prevent cavities. Fluoride is very well controlled and the target dosage recently was reduced to 0.80 mg/L to account for all Fluoride sources such as toothpaste and Fluoride rinses.
- Sodium comes from naturally occurring sources and from road-salt runoff. Sodium Hydroxide is also used in the plant to adjust pH and add alkalinity for the coagulation process. 20 mg/L (5 mg/8 oz.) is considered "low-sodium" by the FDA http://water.epa.gov/scitech/drinkingwater/dws/ccl/sodium.cfm.
- Nitrate is a naturally occurring compound which is also produced when our bleach converts ammonia to nitrates in our treatment process. Ammonia is highest in the winter when the river is frozen and is the probable cause for "strong chlorine" smell complaints.
- Sulfates are mostly added to the water from using Aluminum Sulfate (aka ALUM). There is no MCL for sulfate and our concentrations are very low.
- Chlorite is produced when Chlorine Dioxide (disinfectant similar to bleach) reacts with the raw water. Most of the chlorite is removed by the carbon filters but some does pass through. During the warmer months chlorite is normally very low to none detected.

Bacterial Analysis

Contaminant	Highest Level	Range Detected	Average Detected	MCL MRDL	MCLG MRDLG	Violation Y/N	Possible Source
Total Coliform	0%	0%	0 %	<5%	0	N	Naturally present in environment

- On a weekly basis eleven (11) sites are sampled and tested for bacteria and free chlorine.
- Free Chlorine is always detected at all sample sites, which indicates that our water very stable and the residual chlorine give additional protection against harmful bacteria.

Organic Analysis

Contaminant	Highest Level	Range Detected	Average Detected	MCL MRDL	MCLG MRDLG	Violation Y/N	Possible Source
TTHM (PPB)	73	28-73	47	80	N/A	N	By-product of drinking water chlorination
HAA (PPB)	32	5-32	14	60	N/A	N	By-product of drinking water chlorination
VOC (PPB)	None Detected	None Detected	None Detected	Varies	0	N	Discharges from industrial chemical factories

- Total TriHaloMethanes (TTHM) are produced when bleach is added to water. Four sites are monitored on a quarterly basis and our treatment process is adjusted to minimize the production of THM's.
- HaloAcetic Acids (HAA) is organic compounds produced when bleach is added to water. They are sampled at the same time as TTHM's and are usually very low.
- VOC's there are 65 volatile organic compounds which are tested for each quarter. They range from simples solvents used in industry to other compounds such as Methyl Tertiary Butyl Ether (MTBE) and even Freon.

Unregulated Contaminant Monitoring Rule (3) Data

Unregulated Contaminant Monitoring Rule is used to detect the occurrence of certain compounds in drinking water. Information gained from these studies may result in adding new contaminants to the regulated list of contaminants. More information can be found by searching for the EPA UCMR3 factsheet: EPA ucmr3_factsheet_list1.pdf

Unregulated Contaminant	Range Detected (PPB)	Average Detected	Sample Date	
Chlorate	500-600	550	2/11/15 5/11/15	Agricultural defoliant or desiccant; disinfection byproduct; and used in production of chlorine dioxide
Chromium -6	0.08-0.26	0.17	2/11/15	Naturally-occurring element; used in making steel and other alloys; chromium-3 or -6 forms are used for chrome plating, dyes and pigments, leather tanning, and wood preservation
Total Chromium	ND-0.3	0.15	2/11/15 5/11/15	Naturally-occurring element; used in making steel and other alloys; chromium-3 or -6 forms are used for chrome plating, dyes and pigments, leather tanning, and wood preservation
Strontium	63-67	65	2/11/15 5/11/15	Naturally-occurring element; historically, commercial use of strontium has been in the faceplate glass of cathode-ray tube televisions to block x-ray emissions
Vanadium	0.6-1.3	0.95	2/11/15 5/11/15	Naturally-occurring elemental metal; used as vanadium pentoxide which is a chemical intermediate and a catalyst

- Chlorate is commonly found in the Tewksbury Water. Chlorate is a disinfection by-product from the use of Chlorine Dioxide in treating the water.
- Chromium-6 also known as Hexavalent Chromium is used in pigments for paint, plating chrome metal onto steel
- Total Chromium is all of the Chromium species found in the water at that time.
- Strontium is a metal that will give off a brilliant red colored flame, it is used in flares and fireworks
- Vanadium is a metal commonly used in making tool steel for producing gears, axles and crankshafts

The UCMR (3) analytical list consists of 25 different contaminants which includes certain metals, volatile organic compounds, dioxin, fluorinated compounds, bacterial analysis and chlorate. Only the compounds that have been detected are shown above.
More information is available about the UCMR3 data, please call or e-mail Lewis Zediana at 978-858-0345, e-mail: Lzediana@tewksbury-ma.gov

Physical Analysis

Contaminant	Highest Level	Range Detected	Average Detected	MCL MRDL	MCLG MRDLG	Violation Y/N	Possible Source
Turbidity (NTU)	0.14	0.02-0.14	0.08	0.30	<5%	N	Soil runoff

- Turbidity is a measurement of how cloudy the water is. Water with high turbidity indicates a problem with the treatment process and can interfere with the free chlorine doing its job. Typically the water that is produced at the plant is very low in turbidity (0.02-0.04) which is measured in Nephlometric Turbidity Units or NTU. As a comparison distilled water has a turbidity of just below 0.02 ntu.
- AC pipe (aka transited pipe) was used in the late 1940's as an alternative to cast iron pipe. Although it is reinforced by asbestos fibers the interior is cement lined and no fibers can reach the water. All samples tested for Asbestos fibers have been negative, which has been monitored for years. AC pipe is now being replaced using superior Ductile Iron pipe.

Lead and Copper Monitoring Program (2014)

Contaminant	90th percentile	# of sites exceeded	# of sites Sampled	Action Level	MCLG	Violation Y/N	Possible Source
Lead (PPM)	0.004	0	30	0.015	0	N	Corrosion of household plumbing systems; erosion of natural deposits
Copper (PPM)	0.066	0	30	1.3	0	N	Corrosion of household plumbing systems; erosion of natural deposits

Lead and Copper Program History

Originally over 60 homes were sampled for Lead and Copper analysis. Homes were selected to make sure they contained lead solder and therefore represented "worst case scenario" of pipe corrosion. Special sample bottles are delivered to the homes and the target faucet could not be touched for 24 hours. The first liter of water was sampled and then sent to a certified lab for analysis. Tewksbury has passed all of the Lead and Copper testing cycles since the program started. As a result of our "good" results we are allowed reduced monitoring of only 30 homes.

School Bubbler and Fixture Analysis for Lead & Copper:

The Water Department has operated a fixture monitoring program even before Lead & Copper testing in homes was required. Every bubbler and kitchen fixture was tested in the entire school system and "offending" fixtures were replaced. As the Lead limits were dropped even lower, our Lead & Copper program continued to monitor selected schools as a "search and replace" method was used to insure school fixtures are safe. All fixtures now installed are required to be certified "Lead Free". Our School Lead and Copper Monitoring program will continue as part of our corrosion control program.

Corrosion Control Method:

Zinc Ortho Phosphate is added to the water to reduce corrosion. If new pipes are added or any bare metals surfaces are exposed the zinc "passivates" the metal surface rendering it inactive. The phosphate creates a very thin hard coating on the surface of the pipe interior. This coating creates an insulating barrier so the water technically does not touch the pipe walls. This process helps to keep your porcelain clean of any green discoloration and extends the lifetime of your water pipes. The Zinc concentration is about 0.1 mg/L and the Phosphate concentration runs an average of 0.5 mg/L. The corrosion control effect of this treatment chemical is optimum at a pH of about 7.5 which is also our target pH for finished water. New copper or copper that is repaired will require time for the metal surfaces to become "passivated". As a result it is not unusual that residents will observe pink discoloration on porcelain for a few weeks. This is a copper compound and is only temporary until the new copper is coated.
As always, we thank our volunteer Lead and Copper homes for helping us with this important program.

Helpful Hint: Flush out your hot water tank once or twice a year to remove sediment. This will keep your hot water cleaner and extend your hot water tank life.

Notice of Noncompliance (NON-NE-16-5D005): On March 18th, 2016 the Massachusetts Division of Environmental Protection issued the Town of Tewksbury a Notice of Noncompliance for not procuring a licensed secondary operator for the water distribution system in a timely manner. Our former secondary operator retired on September 1st, 2014 and the Town attempted to procure a new secondary operator, but was unable find a candidate who was properly licensed. As of this May two of our water department employees were able to pass all three licensing exams and were granted a full 3D distribution license. The Town is now in full compliance with the licensed secondary operator requirement.

Help Protect the Town's Streams, Ponds and Wetlands

The Town of Tewksbury, Department of Public Works is continuously working on fulfilling the requirements of the EPA's NPDES (National Pollutant Discharge Elimination System) MS4 Stormwater Permit Regulations. The storm drains throughout the Town of Tewksbury collect runoff known as stormwater from rain storms and snow melt and discharge it to our ponds, streams and wetland resource areas. If contaminants are introduced into the storm drains the downstream receiving waters can become silted and contaminated. Here are some tips to help reduce contamination in stormwater runoff:

Rain Barrels can be either attractive or frivolous.

Landscape Maintenance

- Overfeeding lawns may also green our rivers and ponds. Stormwater runoff can wash excess fertilizers into our drainage system and ultimately to our precious water bodies. This excess fertilizer can promote growth of algae and other aquatic plants, which can negatively impact fish and other aquatic life.
  - Don't over fertilize and avoid application if the forecast calls for rain
  - Select native plants and grasses that are drought and pest resistant. Native plants require less water, fertilizer and pesticides
  - Water during cool times of the day to reduce evaporation and conserve water
  - Never discard yard waste down a storm drain or within 100' of a stream or pond
  - Clear sand, leaves, litter and debris from storm drains

Pet Waste

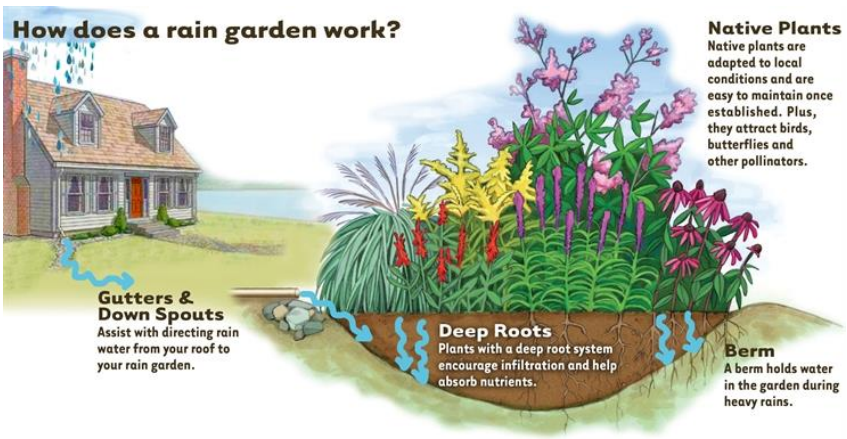
- Pet waste can contribute to pollution of our ponds and streams. Pet waste that is left on the ground can be washed down stream by stormwater runoff and in turn contaminate our ponds and streams. Pet waste contains bacteria that are harmful to humans as well as aquatic animals.
  - Pick up after your pet
  - Dispose of pet waste in the trash
  - Never throw pet waste into a storm drain

Sump Pumps

- Sump pumps can discharge contaminants to the storm drainage system. These pollutants can ultimately drain to surface waters. The US EPA has enacted regulations regarding the discharge of sump pumps. Here are some requirements regarding sump pumps.
  - All sump pumps that discharge water to the Town's storm drain system must obtain a permit from the DPW.
  - Water samples from sump pumps shall be tested on an annual basis; testing is conducted by the DPW.
  - The Town has the authority to immediately disconnect any sump pumps in violation of the EPA regulations or the Town's Bylaw, Chapter 20.

Long Pond

- The Town constructed 19 rain gardens in the summer of 2015 within the Long Pond watershed. These rain gardens collect runoff and remove pollutants prior to the water entering the pond. Over time, the rain gardens will improve the water quality of the pond and as a result improve the habitat for aquatic life.



Clean Water Starts With You
Be the Solution to Stormwater Pollution

Important Definitions and Terminology Used in this Report

1. **Maximum Contaminant Level (MCL)** – the highest level of a contaminant that is allowed in drinking water.
2. **Maximum Contaminant Level Goal (MCLG)** – the level of a contaminant in drinking water below which there is no known or expected risk to health.
3. **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.
4. **Maximum Residual Disinfectant Level Goal (MRDLG)** -- The level of a drinking water disinfectant (chlorine, chloramines, chlorine dioxide) below which there is no known of expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.
5. **Treatment Technique (TT)** – A required process intended to reduce the level of a contaminant in drinking water.
6. **Action Level (AL)** – The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.
7. **PPB –** Parts per billion or micrograms per liter (µg/L).
8. **PPM –** Parts per million or milligrams per liter (mg/L).

Substances found in tap water

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. It 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 -such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
Inorganic contaminants -such as 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, or farming.
Pesticides and herbicides -which may come from a variety of sources such as agricultural, urban storm-water runoff, and residential uses.
Organic chemical contaminants -including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm-water runoff, and septic systems.
Radioactive contaminants -which can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the U.S. Environmental Protection Agency (EPA) prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water that must provide the same protection for public health. All 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 at 800.426.4791.

Important Information

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*:* Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead 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 you are concerned about elevated lead levels in your home's water, you may wish to have your water tested and flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the Safe Drinking Water Hotline at 800.426.4791.

THM: Some people who drink water containing Trihalomethanes in excess of the MCL over many years' experience problems with their liver, kidneys, or central nervous systems, and may have increased risk of getting cancer.

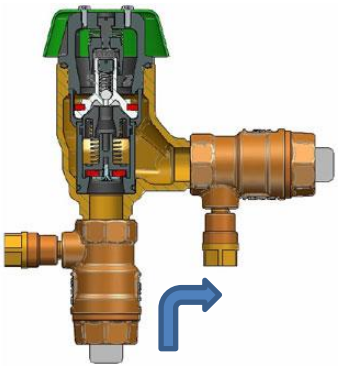
Turbidity: Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease causing organisms. These organisms include bacteria, viruses and parasites that can cause symptoms such as nausea, cramps, diarrhea and associated headaches.

Tewksbury Cross Connection Program

What is a Cross Connection?

A cross connection occurs when the potable drinking water system is physically connected to a possible source of contamination.

A connection to a private well, an industrial process containing harmful chemicals or a fire water storage tank or even a hose left in a bucket of insecticide. In either case, if a sudden drop in pressure occurs, caused by a fire or a broken water main, back syphoning may occur and someone may get hurt. Learn how to prevent this and other situations.



Cross section of a **Pressure Vacuum Breaker**; this device is typically used on lawn irrigation systems to prevent pollution, fertilizers and insecticides from being pulled from your lawn and back into your house. Water flows from the bottom section and the water pressure forces the spring loaded diaphragm at the top closed, allowing water to reach your sprinkler heads under pressure. If the water flow reverses, then the device allows air to enter from the top and "breaks" the vacuum. That's why it's called a Pressure Vacuum Breaker or PVB. This device is so sensitive it can detect and instantly "break" a vacuum of 1 PSI or greater. Testing insures that your device is working correctly.

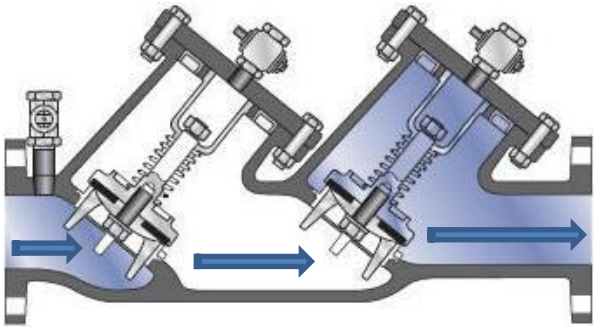
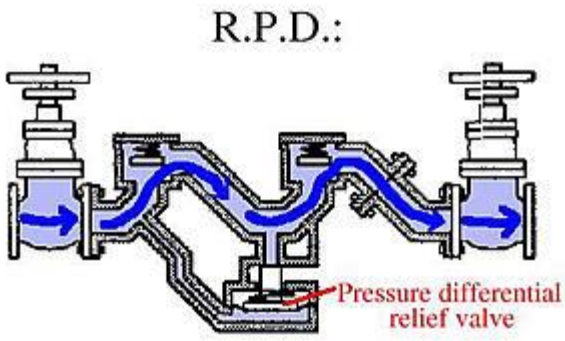


Diagram of a **Double Check Valve Assembly**; this is a simple backflow device more commonly used in fire sprinkler systems. If one check valve is good then two must be better. Some of these devices, when installed in large buildings, can be several feet long and weigh hundreds of pounds. But no matter how large, they all must have the same sensitivity to protect the water supply from backflows.



Reduced Pressure Zone (or device) is a highly sensitive and efficient backflow protector designed to protect a water system or facility from what is referred to as high hazards. RPZ's have two (2) check valves and then one differential relief valve in the middle. When a backflow occurs the relief valve opens to allow air in to "break" the vacuum created. This device will continue to work even if one or both check valves are compromised.

Total Containment Policy: Tewksbury uses a *Total Containment Policy* which requires all Commercial, Industrial, Municipal and Institutional properties to install an RPZ at the meter.

What is the Owners Responsibility?

Owners of any industrial, commercial, agricultural, municipal and/or private residence are required to eliminate any cross connections. If the cross connection cannot be eliminated, then a backflow device may be required. Not sure? Please call 978-858-0345.

If you have a private well there cannot be any physical connection between the well and the Towns water system. All Owners, in accordance to MaDEP regulations, must have a rebuild kit on hand in order to minimize downtime.

**********EDDM*****

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