TOWN OF DUXBURY
CONSUMER CONFIDENCE REPORT
2014

Dear Valued Customer,

It is my pleasure to present to you the 2014 Consumer Confidence Report summarizing the past year in the Water Department. Consumer Confidence Reports are used to inform the public about the quality and quantity of the water and the effort it takes to maintain it. This report is for the calendar year 2014, however, the water quality data includes the most recent round of sampling. It is always a good idea to read the ingredients before you eat or drink a product, so please take some time to read ours. There is a great deal of information enclosed and I hope you enjoy reading it as much as we have creating it.

Respectfully Submitted,
Peter J. Mackin
Water/Sewer Superintendent

Where does the water come from?

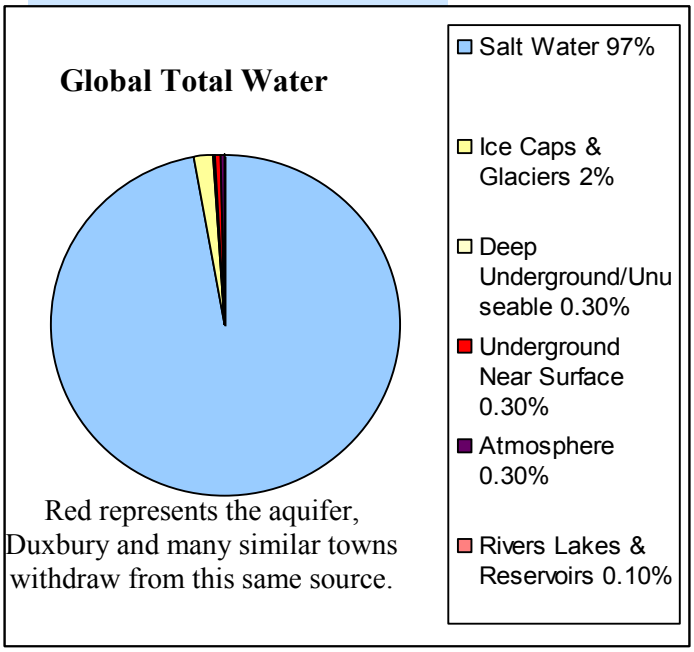
The Town of Duxbury receives its water supply from twelve groundwater sources, all of which are gravel-packed wells located throughout the Town (see map Page 3). Each well has its own pump station and chemical feed equipment. Groundwater is naturally filtered through soil usually not requiring additional filtration, however, Evergreen Wells 1 and 2 are filtered to remove iron and manganese, minerals that can cause staining.

Residents of the Duxbury Beach and Gurnet Road receive their water through an interconnection to the town of Marshfield MA. These homes will receive a copy of the Marshfield CCR in addition to our report.

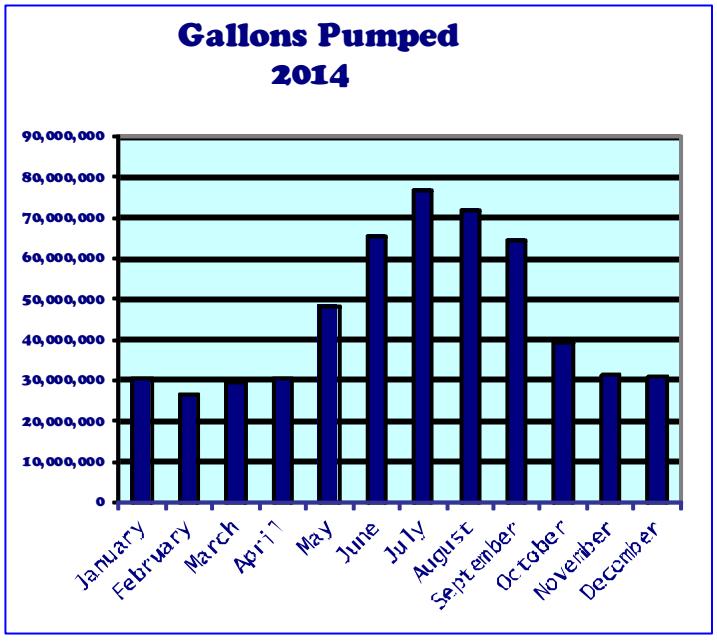
Marshfield residents living on Careswell St., Partridge Brook Cir., Prince Cir., Pioneer Trail, Settlers Path and Enterprise St. all receive water from the Duxbury Water Department. These residents will also receive a copy of this report.

The Massachusetts Water Management Act, enacted in 1985, limits the amount of water that the Town of Duxbury may withdraw from the ground. In addition to that limit, conservation expectations are defined, the average gallons per day used per person must be below 65 gallons. In 2014 the average Duxbury resident used 89 gallons, this was caused primarily by lawn and garden watering as seen on the Gallons Pumped Chart below. On June 30, 2014 Duxbury wells combined pumping was 3.46 Million Gallons, 3.7 times the amount pumped on an average winter day (0.93 MGD). Voluntary water bans are implemented from June to September to reduce outdoor watering.

Please try to conserve water June through September.

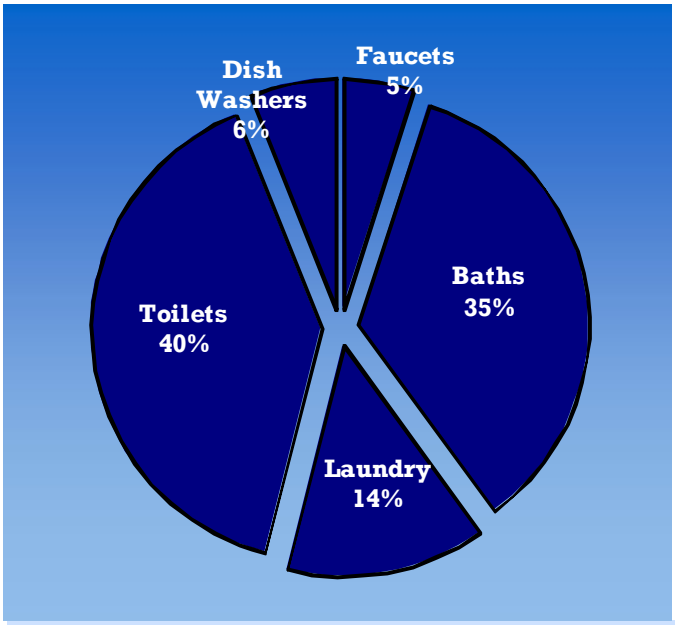


Red represents the aquifer, Duxbury and many similar towns withdraw from this same source.



A TIME TO CONSERVE

This chart reflects the average use of water inside a residential home. ***The largest misuse of water in Duxbury is from outdoor watering.*** See Recommended Water Saving Tips.



Tips for Saving Water - Indoors and Out

- Abide by local water use restrictions. The Water Dept. knows the limits of the system and may enact voluntary restrictions accordingly.
- Water your lawn only as needed. Frequent light watering can actually weaken your lawn by encouraging shallow roots that are less tolerant of dry periods. A good test is to walk across the lawn. If it springs back up, it does not need to be watered. Be sure to check zones if using irrigation. Some areas of your lawn may require less watering than others.
- The best time to water your lawn is early morning (4am to 6am). Avoid watering at mid-day to prevent high evaporation and sun-burned grass.
- Use shut-off nozzles on hoses. Unattended hoses can use 10 gallons or more per *minute*!
- Fix leaking faucets and toilets. Research shows that an average of 8% (or more) of all home water use is wasted through leaks. Leaks in toilets are generally inexpensive to repair. Consider installing a low-flow toilet that only needs 1.6 gallons of water per flush.
- Look for Energy Star labeled products when purchasing new dishwashers and washing machines.

WATER RATES

SENIORS (62 YEARS OR OLDER) ARE ELIGIBLE FOR THE DISCOUNTED BASE CHARGE. IF NOT ALREADY RECEIVING THE DISCOUNTED RATE, SENIORS MUST CALL THE WATER DEPT. OFFICE AT 781-934-1100 EXTENSION 5521 OR 5522.

BASE CHARGE (SEMI-ANNUAL)

FULL RATE **$40.00**
SENIOR RATE **$20.00**
(SENIOR MUST BE 62 YEARS OR OLDER)

CONSUMPTION (SEMI-ANNUAL PER 1,000 GALLONS)

0 - 20,000 GALS	**$4.55** PER THOUSAND
21,000 - 60,000 GALS	**$5.83** PER THOUSAND
61,000 - 120,000 GALS	**$6.70** PER THOUSAND
121,000 + GALS	**$8.05** PER THOUSAND

TOWN	ANNUAL COST	POPULATION
SWAMPSCOTT	$812.00	14,000
NORTH READING	$847.00	14,721
WAYLAND	$916.00	13,897
GARDNER	$631.00	20,770
IPSWICH	$695.00	13,000
DUXBURY	**$554.00**	**16,000**
EAST BRIDGEWATER	$579.00	14,100
FOXBOROUGH	$763.00	16,887
CONCORD	$509.00	15,551
AMESBURY	$768.00	16,450
ACTON	$474.00	20,504

2012 Mass Water Survey (Tighe & Bond)

Water Department operating costs and capital projects are supported solely by revenue from your water bills issued twice a year. The budget is approved at Town Meeting in March, residents are encouraged to be a part of the process.

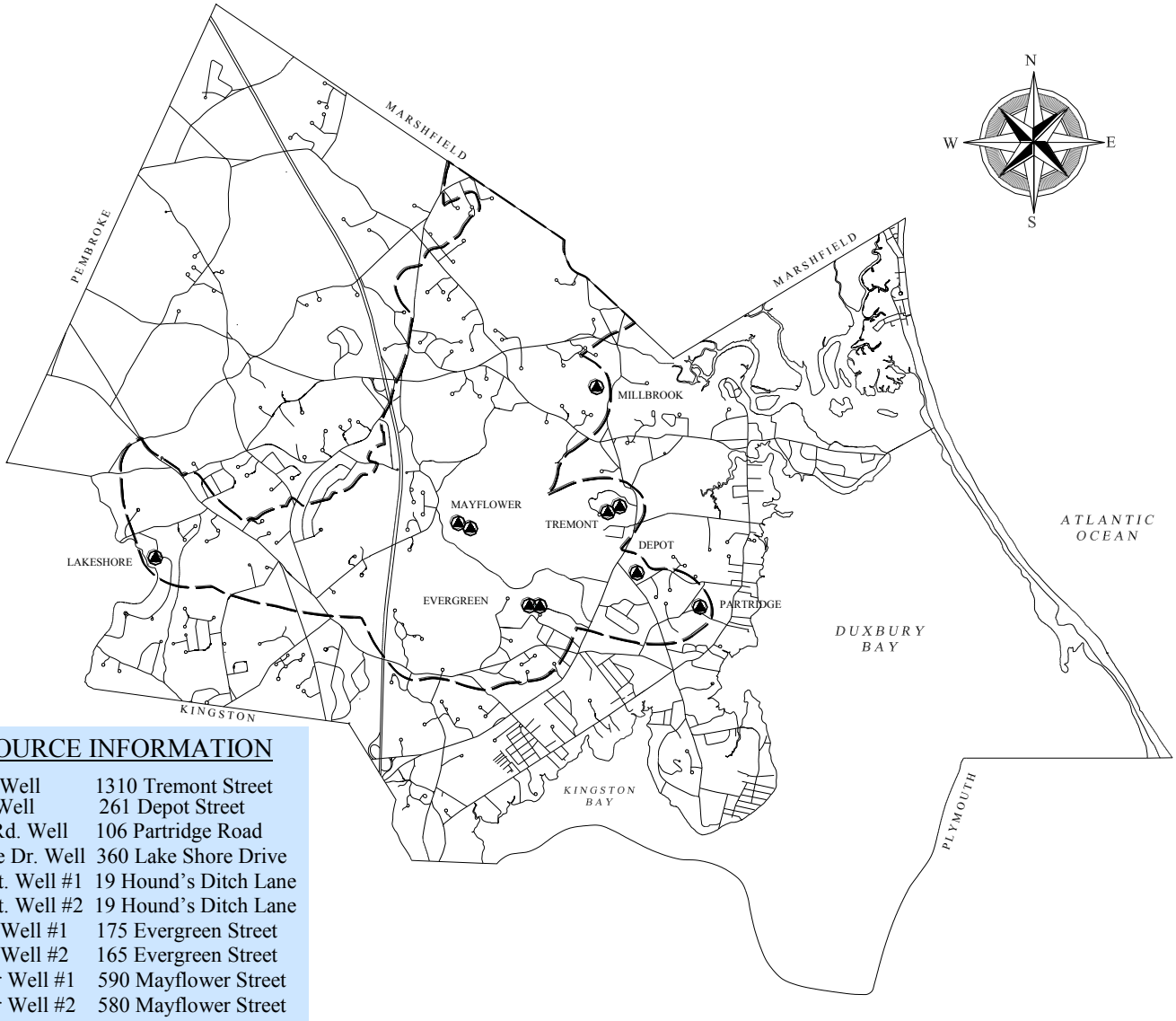
DUXBURY'S "SWAP" REPORT

The Source Water Assessment and Protection (SWAP) program (conducted by the Ma Dept of Environmental Protection), established under the federal Safe Drinking Water Act, requires every state to:

inventory land uses within the recharge areas of all public water supply sources;
assess the susceptibility of drinking water sources to contamination from these land uses; and
publicize the results to provide support for improved protection.

Duxbury's susceptibility ranking is high for all ten wells because they are located in an aquifer with a high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e.: clay) that can prevent contaminant migration.

The Duxbury SWAP report is available at:
The Town Library
&
Water Department Office



SOURCE INFORMATION

Millbrook Well	1310 Tremont Street
Depot St. Well	261 Depot Street
Partridge Rd. Well	106 Partridge Road
Lake Shore Dr. Well	360 Lake Shore Drive
Tremont St. Well #1	19 Hound's Ditch Lane
Tremont St. Well #2	19 Hound's Ditch Lane
Evergreen Well #1	175 Evergreen Street
Evergreen Well #2	165 Evergreen Street
Mayflower Well #1	590 Mayflower Street
Mayflower Well #2	580 Mayflower Street

What chemicals are added to the water?

In order to meet State and Federal Requirements it is necessary to chemically treat the water pumped from the ground. All the wells add sodium hydroxide to reduce the acidity of the water in order to minimize lead and copper leaching out of plumbing in homes. Fluoride is also added to the water at all well sites. Some of the wells require additional chemicals to reduce or sequester the iron and manganese that is naturally occurring. Sodium hexametaphosphate is used to accomplish this task and minimize brown water complaints. The Evergreen Wells require green sand filtration because of the high concentration of iron and manganese (see picture). In this process sodium hydroxide, potassium permanganate and sodium hypochlorite are injected into the water and then filtered through the green sand. Below is a chart showing the chemicals utilized at each well site.

Treatment			**Source**					
	Millbrook Well	**Partridge Well**	**Depot Well**	**Lake Shore Well**	**Tremont 1 & 2**	**Evergreen 1 & 2**	**Mayflower 1 & 2**	**Damon 1 & 2**
pH Adjustment for Corrosion Control	X	X	X	X	X	X	X	X
Chlorine for Disinfection	X	X		X		X		
Filtration for Removal of Iron and Manganese						X		
Sequestration to Reduce Iron Precipitation	X		X		X			
Fluoridation to Promote Health Teeth	X	X	X	X	X	X	X	X

*The Damon Wells began pumping July 20, 2009

CROSS CONNECTIONS

A cross connection is a connection between potable water piping and a source of pollution. The pollution can come from your own home. For instance, you're going to spray fertilizer on your lawn so you hook up your hose to the sprayer containing the fertilizer. If the water pressure drops due to, say a water main break or Fire Department usage, while the hose is connected to the fertilizer, the fertilizer may be siphoned back into the drinking water pipes through the hose. Using an attachment on your hose called a backflow prevention device can stop this from happening.

The Duxbury Water Department recommends the installation of backflow prevention devices such as a low cost vacuum breaker, for all inside and outside hose bibs. These devices can purchased at most hardware or plumbing supply stores. This is an easy way for you to help protect the water supply in your home as well as the drinking water distribution system in your town. Most irrigation systems are outfitted with a backflow prevention device and the Water Department suggests having them tested at least annually. For additional information on cross connections and on the status of your water system's cross connection program, please contact the Duxbury Water and Sewer Superintendent.

SUBSTANCES FOUND IN DRINKING WATER

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, in some cases, radioactive material and can pick up substances resulting from the presence of animal or human activity.

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 the 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. Immune-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders and some elderly and infants can be particularly at risk from infections. These people should seek advice from their health care providers. EPA/Centers for Disease Control and Prevention (CDC) guidelines on appropriate means to lesson the risk of infection by Cryptosporiddium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

Contaminants that may be present in source water before treatment 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 stormwater 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 insure that tap water is safe to drink, the Massachusetts Department of Environmental Protection and EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Duxbury's water is treated according to EPA's regulations. Food and Drug Administration and the Massachusetts Department of Public health regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

All chemicals used for water treatment are approved by the National Sanitation Foundation or Underwriter Laboratories, both accredited by the American National Standards Institute (ANSI). Chemicals must also meet standards established by the American Water Works Association.

The Massachusetts Department of Environmental Protection has specific requirements for the quality of water delivered by public water suppliers. To assure that this quality is maintained the DEP has testing requirements. The table on the following page, lists all the drinking water contaminants that were detected during 2012. THE PRESENCE OF THESE CONTAMINANTS IN THE WATER DOES NOT NECESSARILY INDICATE THAT THE WATER POSES A HEALTH RISK. Unless otherwise noted the data presented is from 2012.

ALL CONTAMINANTS DETECTED WERE BELOW THE MAXIMUM CONTAMINANT LEVEL DETERMINED BY THE EPA

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. Duxbury 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 water 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.

Contaminants Within Detectable Ranges

Substance (Contaminant)	Highest Level Detected	Range of Detection	MCL	MCLG	Source of Contaminant	Violation (Y/N)
INORGANIC						
Barium (ppm)	0.054	0.008-0.054	2	2	Discharge of drilling waste or metal refineries; Erosion of natural deposits.	N
Fluoride (ppm)	1.07[1]	0.14-1.07	4	4	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories.	N
Nitrate (ppm)	3.04	0.35-3.04	10	10	Runoff from fertilizer use; Leaching from septic tanks, sewage; erosion of natural deposits.	N
Sodium (ppm)	92.6	28.4-92.6	N/R	N/R	Naturally present in the environment.	N
ORGANIC						
Total Trihalomethanes TTHMs (ppb)	8.33	1.91 -8.33	80	N/A	By-product of drinking water chlorination.	N
Haloacetic Acids HAA5s (ppb)	1.45	1.35-1.45	60	N/A	By-product of drinking water chlorination.	
Methyl-tertiary-butyl Ether (MTBE) (ppb)	0.53[5]	ND-0.53	20-40	N/A	Fuel additive; leaks and spills from gasoline storage tanks.	N
Bromodichloromethane (ppb)	1.11[6]	1.10-1.11	N/A	N/A	By-product of drinking water chlorination.	N
Perchlorate (ppb)	0.17	ND-0.17	2	N/A	Oxidizers in solid propellants for rockets, missiles, fireworks, and explosives.	N
Chlorodibromomethane (ppb)	0.78[5]	0.55—0.78	N/A	N/A	By-product of drinking water chlorination.	N
Bromoform (ppb)	1.30[5]	1.21—1.30	N/A	N/A	By-product of drinking water chlorination.	
Tetrachloroethylene (ppb)[4]	0.6[3]	0-0.6	5	0	Leaching from vinyl lined asbestos cement pipes.	N
Chloroform (ppb)	0.98	O.50 - 0.98	N/A	N/A	By-product of drinking water chlorination.	N
RADIOACTIVE CONTAMINANTS						
Gross Alpha Activity	2.06[6]	0.74 - 2.06	15 pCi/L		Erosion of natural deposits.	N
Radium 226	0.23[6]	0.04 -0.23	5 pCi/L		Erosion of natural deposits.	N
Radium 228	0.56[6]	0.04 - 0.56	5pCi/L		Erosion of natural deposits.	N
Lead (ppm)	0.028[2]	0.0017—0.028 90th%=0.0			Corrosion of household plumbing.	N
Copper (ppm)	0.69[2]	0.027 - 0.69 90th%= 0.50			Corrosion of household plumbing.	N
Total Coliform	3[4]	N/A	1	0	Naturally present in the environment	Y

MCLG: Maximum Contaminant Level Goal, the level of a contaminant in drinking water bellow which there is no known or expected risk to health. MCLGs allow for a margin of safety.
MCL: Maximum Contaminant Level; The highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the MCLG's as feasible using the best available treatment technology.
AL: Action Level; The concentration of a contaminant which, when exceeded, triggers a treatment or other requirement which a water system must follow.
90th Percentile: Out of every 10 homes, 9 were at or below this level.
NR: Not Regulated **ND:** Not Detectable at testing limit
pCi/L: Alpha Emitters **ppb:** Parts per Billion
ppm: Parts per Million **mgd:** Million gallons per Day
n/a: not applicable

All samples were taken in 2013 unless noted below

1. A secondary MCL for fluoride is 2.0 ppm. Massachusetts Department of Public Health established an optimum level (average) of 1.0 with a range of 0.9-1.3ppm.
2. Lead and Copper in water is due to corrosion of household plumbing, not from source water. All samples were below the Action level due to the treatment of source water reducing the acidity of the water.
3. Sample was collected on 03/27/09. All samples collected in 2014 were N/D.
4. Samples were collected in November 2011.
5. Samples were collected in 2013.
6. Samples were collected 2012.

Contaminants Within Detectable Ranges

Unregulated or Secondary Contaminant	Date Collected	Range Detected	SMCL	ORSG or Health Advisory	Possible Sources
Manganese (ppb)	2/26/14	460	50	300*	Erosion of Natural Deposits

***US EPA and MassDEP have established public health advisory levels for manganese to protect against concerns of potential neurological effects.**

MCLG: Maximum Contaminant Level Goal, the level of a contaminant in drinking water bellow which there is no known or expected risk to health. MCLGs allow for a margin of safety.
MCL: Maximum Contaminant Level; The highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the MCLG's as feasible using the best available treatment technology.
SMCL: Secondary Maximum Contaminant Level
ORSG: Office of Research and Standards Guideline
AL: Action Level; The concentration of a contaminant which, when exceeded, triggers a treatment or other requirement which a water system must follow.
NR: Not Regulated **ND:** Not Detectable at testing limit
ppb: Parts per billion **ppm:** Parts per Million

All samples were taken in 2014 unless noted below

1.

Manganese: 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 MassDEP 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, MassDEP'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 http://www.epa.gov/safewater/ccl/pdfs/reg_determine1/support_cc1_magnese_dwreport.pdf and MassDEP Office of Research and Standards Guideline (ORSG) for Manganese

Department of Public Works – Water Division
PWS ID#4082000
Water/Sewer Department Office
878 Tremont Street – Duxbury, MA 02332
Operation Hours
7:00 AM – 3:30 PM, Monday – Friday

Administrative Office Hours
Monday 8:00 AM - 7:00 PM
8:00 AM - 4:00 PM Tuesday - Thursday
8:00 AM - 12:30 PM Friday
781-934-1100 Ext 5521 or 5522

Fax 781-934-9278

If you would like more information about this report or any other water related issue, please call us at 781-934-1100 ext 5520 or visit our website at www.town.duxbury.ma.us and inform them you have a water related emergency.