2015 DRINKING WATER QUALITY REPORT
TOWN OF HANOVER DEPARTMENT OF PUBLIC WORKS
HANOVER, MASSACHUSETTS 02339
DEP PWSID # 4122000

This report is a snapshot of drinking water quality that we provided in 2015. Included are details about where your water comes from, what it contains, and how it compares to state and federal standards. We are committed to producing drinking water that meets all state and federal drinking water standards.

PUBLIC WATER SYSTEM INFORMATION

Address: 40 Pond Street Hanover, MA 02339

Contact Person: Neal Merritt, Deputy Superintendent Water Operations

Telephone: 781-826-3189 **Fax: 781-826-8915**

Website: http://www.hanoverdpw.org/

Opportunities for Public Participation:
Residents are encouraged to attend and participate in meetings of the Board of Public Works. The meetings are generally held once a month at the Water Treatment Plant located at 40 Pond Street. Please check our web site or contact the D.P.W. office at (781) 826-3189 to determine the next scheduled meeting.

YOUR DRINKING WATER SOURCE

Where Does My Drinking Water Come From?

Source Name	DEP Source ID#	Source Type	Location of Source
Pond Street Wells #1, #2, and #3	4122000-01G, 05G, & 08G	Groundwater	Pond Street
Hanover Street Wells #1 and #2	4122000-03G & 04G	Groundwater	Hanover Street
Broadway Wells #1 and #2	4122000-06G & 07G	Groundwater	Broadway
Beal Wells #1 and #2	4122000-09G & 10G	Groundwater	Riverside Drive

Is My Water Treated?: Our water system makes every effort to provide you with safe and pure drinking water. To improve the quality of the water delivered to you, we treat it to remove several contaminants.

- We add a disinfectant to protect you against microbial contaminants.
- We chemically adjust the water to allow impurities to bond together to settle out of the water.
- We then filter the water to remove any remaining particles.
- We chemically treat the water to a non-corrosive pH to reduce lead and copper concentrations.

How Are These Sources Protected?:
The Department of Environmental Protection (DEP) has prepared a Source Water Assessment Program (SWAP) Report for the water supply sources serving this water system. The SWAP Report assesses the susceptibility of these drinking water sources to contamination noting land uses, transportation corridors, hazardous materials storage and use, oil or hazardous material contamination sites, and comprehensive wellhead protection planning, in the water supply protection areas. The Hanover SWAP report is available at our main office at 40 Pond Street and can also be found on the DEP web site at *http://www.mass.gov/eea/agencies/massdep/water/drinking/source-water-protection-for-drinking-water-supplies.html*

What is My System's Ranking?:
Hanover's wells are located in aquifers with high vulnerability to contamination due to the absence of hydrogeologic barriers (i.e. clay) that can prevent contaminant migration. As a result, Hanover's sources are considered **highly susceptible** to contamination from a variety of sources such as petroleum products, industrial solvents, fertilizers, and microbial contaminants. Susceptibility is a measure of a water supply's *potential* to become contaminated due to land uses and activities within its recharge area and does not imply poor water quality.

What Residents Can Do to Protect Their Drinking Water Supplies:

- Never dispose of household hazardous waste to your septic system
- Participate in household hazardous waste collection days for used oil, antifreeze, paints, and other chemicals
- Apply pesticides and fertilizers minimally and properly. More information on environmentally sound lawn care is available at http://www.mass.gov/eea/agencies/massdep/water/watersheds/lawns-and-landscapes-in-your-watershed.html

What Businesses Can Do to Protect Their Drinking Water Supplies:

- Use Best Management Practices (BMPs) for proper hazardous material handling, storage, and disposal
- Investigate where floor drains flow. If floor drains do not flow to a tight tank or municipal sewer, comply with MassDEP requirements. These regulations can be found at **http://www.mass.gov/eea/agencies/massdep/water/drinking/underground-injection-control.html**

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, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

Microbial contaminants, such as viruses and bacteria, may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic contaminants, such as salts and metals, can be naturally-occurring or result from urban storm water runoff, industrial, or domestic wastewater discharges, oil and gas production, mining, and farming.

Pesticides and herbicides may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.

Organic chemical contaminants include synthetic and volatile organic chemicals that are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

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

In order to ensure that tap water is safe to drink, the DEP and EPA prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. FDA and the Massachusetts Department of Public Health regulations establish limits for contaminants in bottled water that must provide the same protection for public health.

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

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 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 (1-800-426-4791).

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The Hanover Department of Public Works is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

WATER QUALITY TESTING RESULTS

What Does This Data Represent?

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

REGULATED CONTAMINANTS

Microbiological							
Contaminant	**Highest # positive in a month**			**MCL**	**MCLG**	**Violation (Y/N)**	**Possible Sources of Contamination**
Total Coliform	0			1	0	N	Naturally present in the environment
Radioactive Contaminants							
Contaminant	**Year Collected**	**Highest Detected**	**Range Detected**	**MCL**	**MCLG**	**Violation (Y/N)**	**Possible Sources of Contamination**
Gross Alpha (pCi/l)	2012	2.21	0.92–2.21	15	0	N	Erosion of natural deposits
Combined Radium (pCi/L)	2015	1.90	--	5	0	N	Erosion of natural deposits
Inorganic Contaminants							
Contaminant	**Year Collected**	**Highest Detected**	**Range Detected**	**MCL**	**MCLG**	**Violation (Y/N)**	**Possible Sources of Contamination**
Asbestos (MFL)	2013	ND	--	7	7	N	Decay of asbestos cement water mains; Erosion of natural deposits
Nitrate (ppm)	2015	1.23	ND–1.23	10	10	N	Fertilizer runoff; leaching from septic tanks, sewerage; erosion of natural deposits
Fluoride (ppm)	2015	0.15	ND-0.15	4	4	N	Erosion of natural deposits
Perchlorate (ppb)	2015	0.15	ND–0.15	2	NA	N	Rocket propellants, fireworks, munitions, flares, blasting agents
Volatile Organic Contaminants							
Tetrachloroethylene (ppb)	2015	1.0	ND-1.0	5	0	N	Discharge from factories and dry cleaners and asbestos cement lined pipes
Disinfection By-Products							
Contaminant	**Date Collected**	**Highest Result or RAA***	**Range Detected**	**MCL**	**MCLG**	**Violation (Y/N)**	**Possible Sources of Contamination**
Total Trihalomethanes (ppb)	**Quarterly**	**87***	**8-98**	**80**	**NA**	**Y**	**By-product of drinking water chlorination.**
Haloacetic Acids (ppb)	Quarterly	23*	ND-23	60	NA	N	By-product of drinking water chlorination.
				MRDL	**MRDLG**		
Chlorine (ppm)	2015	0.33*	0.02–1.45	4	4	N	Water Additive used to control microbes
*RAA = Highest running annual average for four consecutive quarters							
Lead and Copper							
Contaminant	**Year Collected**	**90th Percentile**	**Action Level**	**MCLG**	**# Sites Sampled**	**# Sites Above AL**	**Possible Sources of Contamination**
Lead (ppb)	2014	3	15	0	30	0	Corrosion of household plumbing systems; erosion of natural deposits
Copper (ppm)	2014	0.29	1.3	1.3	30	0	

1) Most of the data presented in this table is from testing done between January 1 and December 31 2015. We monitor for some contaminants less than once per year, because the concentrations for those contaminants are not expected to vary significantly from year to year. As a result, some of our data though representative is more than a year old. For those contaminants, the date of the last sample is shown in the table.
2) **Maximum Contaminant Level (MCL)**: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
3) **Maximum Contaminant Level Goal (MCLG)**: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
4) **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.

5) **Maximum Residual Disinfectant Level Goal (MRDLG)**: The level of a drinking water disinfectant (chlorine, chloramines, chlorine dioxide) below which there is no known or expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.
6) **Action Level (AL)**: The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow.
7) **90th Percentile**: Out of every 10 homes sampled, 9 were at or below this level.
8) **MFL**: Million fibers per liter longer than 10 micrometers
9) **ppm**: parts per million, or milligrams per liter (mg/l)
10) **ppb**: parts per billion, or micrograms per liter (µg/l)
11) **pCi/l**: picocuries per liter (a measure of radioactivity)
12) **ND**: Not Detected
13) **NA**: Not Applicable

UNREGULATED CONTAMINANTS: Unregulated contaminants are those that don't yet have a drinking water standard set by the EPA. The purpose of monitoring for these contaminants is to help EPA decide whether the contaminants should have a standard.

Contaminant	Year Collected	Average Result	Range Detected	HRL	ORS	Possible Sources of Contamination
Sodium (ppm)	2015	60	46-82	--	20	Runoff from use as salt on roadways; by-product of treatment process
Chromium -6 (ppb)	2013/2014	0.61	0.06-1.8			Naturally occurring element; historically used in steel making
Chromium –total (ppb)	2013/2014	0.96	0.3-1.7			Naturally occurring element; historically used in steel making
Cobalt (ppb)	2013	1.3	ND-1.3			Naturally occurring element found in earth's crust
Molybdenum (ppb)	2013	1.4	ND-1.4			Naturally occurring element found in ores and present in plants, animals, and bacteria
Strontium (ppb)	2013/2014	127.2	91-160			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 (ppb)	2013/2014	0.75	0.3-1.8			Naturally occurring element
Chlorate (ppb)	2013/2014	214	22-460	700		Agricultural defoliant or desiccant; disinfection byproduct
Chloromethane (ppb)	2013	0.3	ND-0.3			Used as foaming agent, in production of other substances, and byproduct that can form when chlorine used to disinfect drinking water
1,4-Dioxane (ppb)	2013	0.09	ND-0.09	1.1		Used as solvent or solvent stabilizer in manufacture and processing of paper, cotton, textile products, automotive coolant, cosmetics and shampoos

1) **HRL**: EPA Health Reference Level
2) **ORS**: The Massachusetts Office of Research and Standards (ORS). ORS issues guidance for chemicals other than those with Massachusetts MCLs in drinking water. These ORS guidance values are usually developed in the absence of any other federal standards or guidance.

ABOUT OUR DRINKING WATER VIOLATION

TOTAL TRIHALOMETHANES: Hanover's drinking water is disinfected with chlorine. In addition to testing for any bacteria in the distribution system, the water is also routinely tested quarterly, at four (4) sites in the distribution system, for the presence of byproducts related to the disinfection process. The EPA sets standards for the maximum levels of both disinfectants and disinfection byproducts (DBP's) in drinking water. This includes substances known as trihalomethanes, collectively called total trihalomethanes or TTHMs. The EPA standard for TTHMs is 80 micrograms per liter (µg/L) which is equivalent to 80 parts per billion (ppb). Compliance limits for TTHMs are calculated by averaging the results over the last four quarters at each location. In 2015, we exceeded this regulatory limit at our Ponderosa Drive sample location in June and September with TTHM levels of 84 ppb and 87 ppb, respectively. 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. They may have a greater risk of getting cancer.

On July 2, 2015: The Hanover Water Department entered into an Administrative Consent Order with the Massachusetts DEP as a result of our failure to meet this standard. As part of this Consent Order we were required to meet the following deadlines:

- August 1, 2015: Provide a letter report to DEP explaining immediate actions to manage TTHMs at Ponderosa Drive. This report was submitted to DEP on July 31, 2015.
- October 30, 2105): Submit Professional Engineer's Report to DEP documenting findings, results, conclusions, and recommendations of the Engineer's investigation into elevated TTHM levels. In addition, submit Intended Action Plan

with a timeline for implementation simultaneously with the Professional Engineer's Report. Our engineers, Weston & Sampson of Peabody, Massachusetts submitted the Report and Intended Action Plan October 29, 2015.

- July 2, 2018: The Hanover Water Department shall complete any construction required to correct the elevated TTHM levels.

The aforementioned submittals can be found on our web site at. http://hanoverdpw.org/Disinfection_byproducts.shtml. If you want more information about TTHMs or the violation, please call Neal Merritt, Deputy Superintendent Water Operations at (781-826-3189). Funds to implement the recommendations of Weston & Sampson were appropriated at the May 2016 Town Meeting.

We are pleased to report that TTHMs levels have been below the regulatory limit of 80 ppb at all locations over the last three quarters. This would include samples collected in December 2015, March 2016, and June 2016.

EDUCATIONAL INFORMATON

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

Sodium: The MassDEP, Drinking Water Program (DWP), has established a sodium guideline of 20 mg/L. This concentration is in line with the limit applied to bottled water by the United States Food and Drug Administration (USFDA) for low sodium water. The guideline represents a level of sodium in water that physicians and sodium sensitive individuals should be aware of in cases where sodium exposures are being carefully controlled. Additional information on sodium in drinking water can be found at www.mass.gov/eea/agencies/massdep/water/drinking/lead-and-other-contaminants-in-drinking-water.html#15

WATER CONSERVATION TIPS

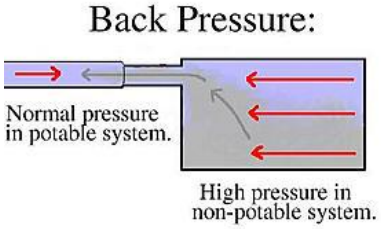
- Check faucets and toilets for leaks.
- Install low - flow aerators on bathroom and kitchen faucets.
- Run dishwasher and washing machine only when they are full.
- Water in the early morning or evening.
- Keep grass at least three inches high to shade roots and hold moisture.

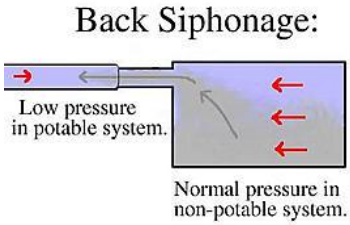
BACKFLOW PREVENTION

The Hanover Water Department makes every effort to ensure that the water delivered to your home and business is clean, safe, and free of contamination. But what happens when the water reaches your home or business? There is still a need to protect the water quality from contamination caused by a cross-connection.

What is a cross-connection?
A cross-connection occurs whenever the drinking water supply is or could be in contact with potential sources of pollution or contamination. Cross-connections exist in piping arrangements or equipments that allow the drinking water to come in contact with non-potable liquids, solids, or gases (hazardous to humans) in event of a backflow.

What is backflow?
Backflow is the undesired reverse of the water flow in the drinking water distribution lines. This backward flow of water can occur when the pressure created by equipment or a system, such as a boiler or air-conditioning, is higher than the water pressure inside the water distribution line (backpressure), or when the pressure in the distribution line drops due to routine occurrences such as water main breaks or heavy water demand causing the water to flow backward inside the water distribution system (backsiphonage). Backflow is a problem that many water consumers are unaware of. And every water customer has a responsibility to help prevent them.





What you can do to help prevent a cross-connection

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

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

If you are the owner or manager of a property that is being used as a commercial, industrial, or institutional facility you must have your property's plumbing system surveyed for cross-connection. If your property has NOT been surveyed for cross-connection, contact this office at 781-826-3189 to schedule a cross-connection survey.

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

In 2015 we conducted cross connection surveys on 92 industrial, commercial and municipal facilities. In addition, we conducted backflow prevention tests on 145 DCVAs and 290 RPBPs.