2016 Annual Drinking Water Quality Report for the Provincetown Water Department

The Provincetown Water Department is proud to provide you with the Year 2016 Annual Drinking Water Quality Report. Our objective is to help keep you abreast of ongoing and upcoming water system projects; local, state and federal drinking water regulations; and Provincetown's annual water quality results. The Provincetown Water Department is committed to supplying our customers with high-quality drinking water 24 hours a day, 365 days a year. The Town of Provincetown Public Water System DEP identification number is 4242000.

Customer Views and Questions

Please call the Water Department at 508-487-7060 with any questions, concerns, or problems regarding your water service (billing, water quality, meters, leaks, policies); or the water system (water main breaks, fire hydrants, upcoming activities). Our staff of drinking water professionals is there to assist you:

Water Superintendent **Cody J. Salisbury**
Director of Public Works **Richard J. Waldo, P.E.**

The Water Department office is located within the Department of Public Works at 2 Mayflower Street in Provincetown. The business hours are Monday through Thursday 7 a.m. until 4 p.m. and Friday 7 a.m. until 11 a.m. Supplemental information about the Water Department including Rules and Regulations for water service can be found on our website: **www.provincetown-ma.gov**. This report is also available on the Town's website, at the Provincetown and Truro Public Libraries, and at the Water Department offices.

The Provincetown Water Department is governed by the Provincetown Water & Sewer Board, which meets at the Veterans Memorial Community Center, 2 Mayflower Street, Provincetown. The public is invited. You may contact the Water Department or check the Town website for a meeting schedule. In addition to these local resources, additional information about drinking water quality and potential health effects can be obtained by calling the Environmental Protection Agency's **Safe Drinking Water Hotline: 800-426-4791**.

Water System Information

We are proud to state that the year 2017 marks the 125th anniversary of Provincetown Water Department! The Provincetown Water Department supplies drinking water to the Town of Provincetown and several areas within the Town of Truro. Provincetown's water supply sources consist of three wellfields located in the Pamet Lens of the Cape Cod Aquifer. The Pamet Lens extends from the north side of the Pamet River to East Harbor. The sources include the South Hollow Wellfield (4242000-03G), consisting of six active individual wells, the Knowles Crossing Wellfield (4242000-02G), consisting of three individual wells, and North Union Field (4242000-06G & 07G), consisting of two individual wells. The Town of Provincetown also has two additional wells (4242000-04G & 05G) for an emergency supply. These wells are located at the former North Truro Air Force Base which now lies within the boundaries of the Cape Cod National Seashore. Groundwater pumped from the Knowles Crossing Wellfield and Paul Daley Wellfield are treated at the Knowles Crossing Water Treatment Facility, which went online April 2014. Treatment is for iron and manganese removal, disinfection, and pH adjustment. Groundwater pumped from the North Union Field Wells is treated at the South Hollow Corrosion Control Facility for disinfection and pH adjustment.

All reservoirs and some ground water sources contain numerous microorganisms, some of which can cause people to be sick. To eliminate disease carrying organisms it is necessary to disinfect the water. Disinfection does not sterilize the water, but it does destroy harmful organisms. Sterilization kills all microorganisms, even though most are not harmful, and is too costly to use on a routine basis. The Provincetown Water Department uses sodium hypochlorite as its primary disinfectant. Chlorine destroys organisms by penetrating cell walls and reacting with enzymes. Disinfection with chlorine has proven effective at ensuring that water is free of harmful organisms and safe to drink.

Many drinking water sources in New England are naturally corrosive (i.e. they have a pH of less than 7.0). So, the water they supply has a tendency to corrode and dissolve the metal pipe it flows through. This not only damages pipes but can also add harmful metals, such as lead and copper, to the water. For this reason it is beneficial to add chemicals that make the water neutral or slightly alkaline. This is done

by adding any one, or combination of several, approved chemicals. The Provincetown Water Department adds potassium hydroxide to its water. This adjusts the water to a non-corrosive pH. Testing throughout the water system has shown that this treatment has been effective at reducing lead and copper concentrations.

Iron and manganese are often present in groundwater at levels that can discolor the water, or cause it to take on unpleasant odors or tastes. Even though the water may still be safe to drink, it is preferable that the iron and manganese be removed. Removal generally requires a two-step process of oxidation and filtration. Oxidation is accomplished by adding potassium permanganate to the water. This causes the iron and manganese to form tiny particles. Once this happens, the water passes through special filters consisting of a material that is specifically designed to capture iron and manganese particles. Over time, filters start to clog and need to be cleaned using a high flow backwash process.

All chemicals used for oxidation, disinfection and pH adjustment, are approved by one of the following organizations: National Sanitation Foundation (now known as NSF International), or UL, both accredited by the American National Standards Institute (ANSI). Chemicals also have to meet performance standards established by the American Water Works Association.

Water from the Paul Daley Wellfield is delivered to the Knowles Crossing Treatment plant through a 10-inch raw water transmission main on Route 6. Treated water is pumped into the water distribution network and delivered through a 12-inch transmission main traveling from South Hollow Road and along Shore Road in North Truro to the Provincetown town line. The water distribution system is made up of approximately 40 miles of pipe of varying size between 4-inches and 16-inches in diameter, 675 gate valves, and 250 fire hydrants. The water distribution system also includes two water storage tanks: the Mt. Gilboa tank in the east end of Provincetown which has a capacity of approximately 2.7 million gallons; and the Winslow Street tank located adjacent to Veteran's Memorial Community Center which has a capacity of 3.8 million gallons. Together these water storage tanks provide water during peak hourly water demands and for fire protection.

Cross-Connection Control

A cross-connection is an existing or potential connection through which drinking water could be contaminated or polluted due to a backflow or backsiphonage. Regulations are specific as to the water supplier's and water user's responsibilities regarding cross-connection protection. The water supplier has the responsibility to prevent contamination of the water system from the source to the user's connection, and the user is responsible for keeping contaminants out of the water system from their connection. Common cross-connections are heating, cooling, fire protection, and irrigation systems. Garden hoses are a common source of cross-connection at our homes as they are often contaminated with soaps, cleaning chemicals, fertilizers, pool water, etc. The Provincetown Water Department recommends the installation of backflow prevention devices, such as a low cost hose bib vacuum breaker, for all inside and outside hose connections. You can purchase this at a hardware store or plumbing supply store.

The Provincetown Water Department maintains a DEP-approved cross-connection program whereby all industrial, commercial, and institutional premises are surveyed for cross-connections and, when identified, mandates their elimination or the installation of appropriate cross-connection control device(s). For more information regarding cross-connection control, contact Cody J. Salisbury at the Provincetown Water Department.

Source Water Assessment and Protection

The Source Water Assessment and Protection (SWAP) program assesses the susceptibility of public water supplies to potential contamination by microbiological pathogens and chemicals. A susceptibility ranking of high was assigned to this system using information collected by the DEP. Pesticide storage and use, gas stations, junk yards and salvage yards, military facilities, and underground storage tanks were identified as sources of potentially significant contamination located within the source water areas. For more information, contact Cody J. Salisbury. The complete SWAP report is available at the Water Department Office, 2 Mayflower Street or on the website http://www.mass.gov/dep/water/drinking/4242000.pdf.

Public Health and Drinking Water

The 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, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife. **Pesticides and Herbicides**, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses. **Inorganic Contaminants**, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial, or domestic wastewater discharges, oil and gas production, mining, or farming. **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 stormwater 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 Department and EPA prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (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 **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/Centers for Disease Control and Prevention** (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminates are available from the Safe Drinking Water Hotline (800-426-4791); Web page www.epa.gov/safewater) or the Massachusetts DEP (Southeast Regional office 508-946-2700; Web page www.state.ma.us/dep).

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 Provincetown Water Department is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water is 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 www.epa.gov/safewater/lead.

Water Quality Summary

The Water Department is committed to providing our customers with the highest quality drinking water that meets or exceeds Mass DEP drinking water standards and performs regular sampling (monthly or more frequently) throughout the distribution system to monitor water quality. Over the course of the year the Water Department performs over 1,000 water quality analyses, testing for more than 120 different contaminants, to ensure that our water meets these standards.

The following table lists all the drinking water contaminants that were detected during the 2016 calendar year or during the most recent sampling period within the past five years. These were the only contaminants detected in all the monitoring required by the state. 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 in this table is from testing done from January 1 through December 31, 2016. The state requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. Some of the data, though representative of the water quality, is more than one year old.

Regulated Contaminants

Inorganic Contaminants

Contaminant (units)	Date(s) Sampled	Highest Level Detected	Range of Detection	MCL	MCLG	Typical Source(s) of Contaminant	Violation Y/N
Barium (ppm)	2015	0.005	0.005 – 0.005	2	2	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits	N
Nitrate (ppm)	2016	0.55	0.13 – 0.55	10	0	Run-off from fertilizer; leaching from septic tanks; sewage; erosion of natural deposits	N

Organic Chemical Contaminants

Contaminant (units)	Date(s) Sampled	Highest Level Detected	Range of Detection	MCL	MCLG	Typical Source(s) of Contaminant	Violation Y/N
Tetrachloroethylene (ppb)	2014, 2016	1.23	ND – 1.23	5	0	Leaching from vinyl lined asbestos cement pipe	N

Radioactive Contaminants

Radioactive Contaminants	Date(s) Sampled	Highest Level Detected	Range of Detection	MCL	MCLG	Typical Source(s) of Contaminant	Violation Y/N
Gross Alpha Activity (pCi/l)	2012	1.66	0.29 – 1.66	15	0	Erosion of natural deposits	N
Radium 226 & 228 (pCi/l)	2012	0.31	0.24 – 0.31	5	0	Erosion of natural deposits	N

Disinfectant and Disinfection By-Products

Contaminant (units)	Date(s) Sampled	Highest Annual Average	Range of Detection	MCL	MCLG	Typical Source(s) of Contaminant	Violation Y/N
Chlorine (ppm)	2016	0.90	0.37 – 1.15	MRDL=4	MRDLG=4	Water additive used to control microbes	N
Haloacetic Acids (HAA5) (ppb)	2016, Quarterly	4.4	0 – 9.19	60	N/A	By-product of water chlorination	N
Total Trihalomethanes (TTHMS) (ppb)	2016, Quarterly	5.7	2.91 – 14.6	80	N/A	By-product of water chlorination	N

Lead and Copper

Contaminant (units)	Date(s) Sampled	90th Percentile	Action Level	MCLG	# of Sites Sampled	# of Sites above the AL	Typical Source(s) of Contaminant
Copper (ppm)	2014	0.086	1.3	1.3	30	0	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Lead (ppb)	2014	1.8	15	0	30	0	Corrosion of household plumbing systems; erosion of natural deposits

Unregulated Contaminants (those contaminants for which EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist EPA in determining their occurrence in drinking water and whether future regulation is warranted)

Contaminant (units)	Date(s) Sampled	Highest Level Detected	Range of Detection	Average Detected	SMCL	Health Advisory	ORSG	Typical Source(s) of Contaminant
Chlorate (ppb)	2014	150	22-150	91.6				Agricultural defoliant, disinfection by Product of drinking water chlorination
Chloroform (ppb)	2016	2.39	1.77 – 2.39	2.08				By-product of water chlorination (regulated collectively with total trihalomethanes, TTHMs) In non-chlorinated sources, chloroform may be naturally occurring.
Chromium (ppb)	2014	1.4	0.4-1.4	0.65				Naturally occurring element; used in Used in making steel and other alloys; used Used for chrome plating, dyes and pigments, Leather tanning and wood preservation
Hexavalent Chromium (ppb)	2014	0.55	0.41-0.55	0.48				Naturally occurring element; used in Used in making steel and other alloys; used Used for chrome plating, dyes and pigments, Leather tanning and wood preservation
Manganese (ppb)	2016	20	ND – 20	24	50	300		Erosion of natural deposits
Sodium (ppm)	2015	24.5	15.6 – 24.5	20			20	Natural sources; runoff from use as salt on roadways; by-product of treatment process
Strontium (ppb)	2014	47	23-47	33.5				Naturally occurring element; used in faceplate glass of cathode-ray tube televisions To block x-ray emissions

Health Effects Statement - Sodium: Sodium sensitive individuals, such as those experiencing hypertension, kidney failure, or congestive heart failure who drink water containing sodium should be aware of the sodium levels where exposures are being carefully controlled.

Definitions:

90th %tile	Out of every 10 homes, 9 were at or below this level.
MCL	Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs (see below) as feasible using the best available treatment technology.
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.
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 the control of microbiological contamination.
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 contaminants.
ppm	One part per million.
ppb	One part per billion.
AL	Action Level: The concentration of a contaminant that, if exceeded, triggers treatment or other requirements, which a water system must follow.
NR	Not regulated (currently there is no MCL for this compound).
N/A	Not applicable.
ND	Not detected. Refers to the detection limit of the chemical analysis instrument or procedure.
TT	Treatment Technique. A required process intended to reduce the level of a contaminant in drinking water.
pCi/l	Picocuries per liter (a measure of radioactivity).
ORSG	Massachusetts Office of Research and Standards Guideline. This is the concentration of a chemical in drinking water at or below which adverse health effects are unlikely to occur after chronic (lifetime) exposure. If exceeded, it serves as an indicator of the potential need for further action.
SMCL	Secondary Maximum Contaminant Level: These standards are developed to protect the aesthetic qualities of drinking water and are not health based.