ANNUAL
WATER QUALITY REPORT

WATER TESTING
PERFORMED IN 2015

Presented By
City of Portsmouth

PWS ID#: 3740600

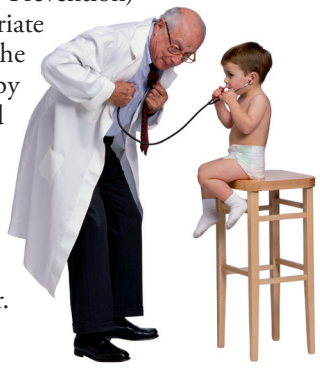
Meeting the Challenge

Once again we are proud to present our annual drinking water report, covering all drinking water testing performed between January 1 and December 31, 2015. Over the years, we have dedicated ourselves to producing drinking water that meets all State and Federal standards. We continually strive to adopt new methods for delivering the best-quality drinking water to your homes and businesses. As new challenges to drinking water safety emerge, we remain vigilant in meeting the goals of source water protection, water conservation, and community education while continuing to serve the needs of all of our water users.

Please remember that we are always available to assist you should you ever have any questions or concerns about your water.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as those with cancer undergoing chemotherapy, those who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791 or http://water.epa.gov/drink/hotline.



Substances That Could Be in Water

To ensure that tap water is safe to drink, the U.S. EPA prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. U.S. Food and Drug Administration 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 these contaminants does not necessarily indicate that the water poses a health risk.

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, in some cases, radioactive material, and substances resulting from the presence of animals or from human activity. Substances 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, or wildlife;

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or may result from urban stormwater 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 agriculture, 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 may also come from gas stations, urban stormwater runoff, and septic systems;

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

For more information about contaminants and potential health effects, call the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

Failure In Flint

The national news coverage of water conditions in Flint, Michigan has created a great deal of confusion and consternation over the past year. The water there has been described as being corrosive; images of corroded batteries and warning labels on bottles of acids come to mind. But is corrosive water bad?

Corrosive water can be defined as a condition of water quality, which will dissolve metals (iron, lead, copper, etc.) from metallic plumbing at an excessive rate. There are a few contributing factors but, generally speaking, corrosive water has a pH of less than seven; the lower the pH, the more acidic, or corrosive, the water becomes. By definition, many natural waterways throughout the country can be described as corrosive. While all plumbing will be somewhat affected over time by the water it carries, corrosive water will damage plumbing much more rapidly than water with low corrosivity.

By itself, corrosive water is not a health concern; your morning glass of orange juice is considerably more corrosive than the typical lake or river. What is of concern is that exposure in drinking water to elevated levels of the dissolved metals increases adverse health risks.

Public water systems are required to maintain their water at optimal conditions to prevent it from reaching corrosive levels. We strive to follow all regulatory guidelines to ensure compliance by routinely monitoring the water in the distribution system. For more information on how corrosivity impacts water quality, download this informative pamphlet at: pubs.ext.vt.edu/442/442-665/442-665_PDF.pdf.

Source Water Assessment

The Source Water Assessment Plan (SWAP) is available at our watershed office (757) 539-2201 ext. 222. The SWAP is an assessment of the delineated area around our listed sources through which contaminants, if present, could migrate and reach our source water. It also includes an inventory of potential sources of contamination within the delineated area, and a determination of the water supply's susceptibility to contamination by the identified potential sources.

The State drinking water program has found that our drinking water is potentially most susceptible to agriculture, urban, and forestry runoff.

However, we have not detected any contaminants from these sources in our drinking water. If you would like to review the Source Water Assessment Plan, please feel free to contact our office during regular office hours.

Source Water Description

Your tap water comes from surface lakes including Lake Meade and Lake Kilby and five deep wells. Portsmouth's water treatment facility has the capacity to treat 32 million gallons of water each day and serves over 120,000 customers in Portsmouth, Chesapeake, and Suffolk.

Questions?

For More Information

At the City of Portsmouth Department of Public Utilities, we value our customers and work hard to ensure your satisfaction. If you have questions or comments about this report or other issues concerning water quality, please call us or the other sources of water quality information listed below:

City of Portsmouth
Water Quality Desk
(757) 539-2201 ext 240

Additional sources of information regarding water quality may be found at:

Virginia Department of Health
Office of Water Programs
(757) 683-2000

U.S. Environmental Protection Agency
Safe Drinking Water Hotline
(800) 426-4791

This Water Quality Report as well as other City information can also be viewed at our Web site. Please visit us at www.portsmouthva.gov

Water Treatment Process

The treatment process consists of a series of steps. First, water is drawn from our lakes at various intakes. It is here that oxidation takes place. We use permanganate to oxidize the source water for iron and manganese removal. In addition, this chemical helps with taste and odor caused by naturally occurring organic matter found in the source water. The water then goes through a rapid mix where a coagulant, aluminum sulfate, is added. The addition of this substance initiates the coagulation process. Coagulation is the process that causes very small suspended particles to attract one another and form larger particles accomplished by the addition of the chemical.

The water is then sent to a contact basin where caustic is added for pH control. From there the water is sent to the clarifiers. At the head of each clarifier, polymer and carbon are added, initiating the flocculation process. The flocculation process converts the small suspended particles into larger, more settleable clumps, referred to as floc. The clarifiers act as large settling basins in which water is retained to allow the floc to settle out by gravity. The water is next sent to multimedia filters for filtration, and liquid chlorine is added for disinfection. Fluoride is added by the addition of well water that has naturally occurring levels of fluoride. Finally the water is pumped to one of two clear well holding tanks where ammonia is added before pumping to the distribution system. The ammonia is added to the chlorinated water forming chloramines, which maintain a longer residual in the distribution system and reduce the amount of disinfection by-products formed.

This treatment process has proven to be very effective at producing high-quality drinking water that meets and exceeds all Federal testing standards.

LT2 Rule

The U.S. EPA has created the Long Term 2 Enhanced Surface Water Treatment Rule (LT2) for the sole purpose of reducing illness linked with the contaminant *Cryptosporidium* and other disease-causing microorganisms in drinking water. The rule will bolster existing regulations and provide a higher level of protection for your drinking water supply. Sampling of our water source has shown the following:

Giardia lamblia: (0.09 (Oo)cysts/L)

It is important to note that these results are from our raw water source only and not from our treated drinking water supply. For more information, contact the U.S. EPA's Safe Drinking Water Hotline at (800) 426-4791.

Lead in Home Plumbing

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. Lake Kilby Water Treatment Plant is responsible for providing high-quality drinking water, but we 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 www.epa.gov/safewater/lead.

Water Main Flushing

Distribution mains (pipes) convey water to homes, businesses, and hydrants in your neighborhood. The water entering distribution mains is of very high quality; however, water quality can deteriorate in areas of the distribution mains over time. Water main flushing is the process of cleaning the interior of water distribution mains by sending a rapid flow of water through the mains.

Flushing maintains water quality in several ways. First, flushing removes sediments like iron and manganese. Although iron and manganese do not pose health concerns, they can affect the taste, clarity, and color of the water. Additionally, sediments can shield microorganisms from the disinfecting power of chlorine, contributing to the growth of microorganisms within distribution mains. Flushing helps remove stale water and ensures the presence of fresh water with sufficient dissolved oxygen, disinfectant levels, and an acceptable taste and smell.

During flushing operations in your neighborhood, some short-term discoloration of water quality is possible. If you do use the tap, allow your cold water to run for a few minutes at full velocity before use and avoid using hot water to prevent sediment accumulation in your hot water tank.

Please contact us if you have any questions or if you would like more information on our water main flushing schedule.

Sampling Results

During the past year, we have taken hundreds of water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic, or synthetic organic contaminants. The tables below show only those contaminants that were detected in the water. The State requires us to monitor for certain substances less often than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent data are included, along with the year in which the sample was taken.

REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	MCL [MRDL]	MCLG [MRDLG]	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Alpha Emitters (pCi/L)	2014	15	0	2.2	NA	No	Erosion of natural deposits
Barium (ppm)	2015	2	2	0.028	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Beta/Photon Emitters[1] (pCi/L)	2014	50	0	5.0	NA	No	Decay of natural and man-made deposits
Chloramines (ppm)	2015	[4]	[4]	3.3	2.12–4.1	No	Water additive used to control microbes
Combined Radium[2] (pCi/L)	2014	5	0	0.6	NA	No	Erosion of natural deposits
Fluoride (ppm)	2015	4	4	0.70	0.50–1.8	No	Erosion of natural deposits; Water additive that promotes strong teeth; Discharge from fertilizer and aluminum factories
Haloacetic Acids [HAAs] (ppb)	2015	60	NA	45	27–59	No	By-product of drinking water disinfection
Nitrate (ppm)	2015	10	10	0.05	0.000–0.219	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes] (ppb)	2015	80	NA	47	20–71	No	By-product of drinking water disinfection
Total Organic Carbon (ppm)	2015	TT	NA	1.99	1.34–2.90	No	Naturally present in the environment
Turbidity[3] (NTU)	2015	TT	NA	0.13	0.03–0.13	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2015	TT = 95% of samples < 0.3 NTU	NA	100	NA	No	Soil runoff

Tap water samples were collected for lead and copper analyses from sample sites throughout the community.

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH%TILE)	SITES ABOVE AL/ TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2015	1.3	1.3	0.17	0/58	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2015	15	0	<1	1/58	No	Corrosion of household plumbing systems; Erosion of natural deposits

SECONDARY SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	MCLG	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Chloride (ppm)	2015	250	NA	22	NA	No	Runoff/leaching from natural deposits
pH (Units)	2015	6.5–8.5	NA	7.8	7.0–7.9	No	Naturally occurring
Sulfate (ppm)	2015	250	NA	59	NA	No	Runoff/leaching from natural deposits; Industrial wastes
Total Dissolved Solids [TDS] (ppm)	2015	500	NA	195	195–294	No	Runoff/leaching from natural deposits

OTHER SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Alkalinity (ppm)	2015	74	54–126	Naturally occurring
Calcium Hardness (ppm)	2015	16	14–28	Naturally present in sedimentary rocks
Conductivity (µS/cm)	2015	377	297–438	Naturally occurring
Corrosion Index (Langlier)	2015	-1.02	-2.16–-0.78	Naturally or industrially influenced balance of hydrogen, carbon, and oxygen in the water; Affected by temperature and other factors
Hardness (ppm)	2015	22.4	14–30	Naturally occurring
Ortho-Phosphate (ppm)	2015	0.08	NA	Naturally occurring in rocks and other minerals
Total Sodium (ppm)	2015	62.8	42.4–101	Naturally occurring

[1] The MCL for beta particles is 4 mrem/year. The U.S. EPA considers 50 pCi/L to be the level of concern for beta particles.
[2] 0.6 pCi/L in the table is for Radium 226. Radium 228 tested at <0.9 pCi/L.
[3] Turbidity is a measure of the cloudiness of the water. It is monitored because it is a good indicator of the effectiveness of the filtration system.

Definitions

AL (Action Level): The concentration of a contaminant that, if exceeded, triggers treatment or other requirements that a water system must follow.

µS/cm (microsiemens per centimeter): A unit expressing the amount of electrical conductivity of a solution.

LRAA (Locational Running Annual Average): The average of sample analytical results for samples taken at a particular monitoring location during the previous four calendar quarters. Amount Detected values for TTHMs and HAAs are reported as LRAAs.

MCL (Maximum Contaminant Level): 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.

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 control of microbial contaminants.

MRDLG (Maximum Residual Disinfectant Level Goal): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

NA: Not applicable

NTU (Nephelometric Turbidity Units): Measurement of the clarity, or turbidity, of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

pCi/L (picocuries per liter): A measure of radioactivity.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).

SMCL (Secondary Maximum Contaminant Level): SMCLs are established to regulate the aesthetics of drinking water like taste and odor.

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