Annual

WATER QUALITY REPORT

Reporting Year 2012

Presented By

THE CITY OF PORTSMOUTH

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There When You Need Us

We are once again proud to present our annual water quality report covering all testing performed between January 1 and December 31, 2012. 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 you. 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 our water users.

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

Source Water Description

Your tap water comes both from surface lakes to include Lake Meade and Lake Kilby and from five deep wells. Portsmouth's water treatment facility has the capacity to treat 33 million gallons of water each day and serves over 120,000 customers in Portsmouth, Chesapeake, and Suffolk.

Source Water Assessment

A Source Water Assessment Plan (SWAP) is available at our watershed office: 539-2201 ext. 222. This plan 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.

According to the Source Water Assessment Plan, our water system had a susceptibility rating of "medium." If you would like to review the Source Water Assessment Plan, please feel free to contact our office during regular office hours.

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, which 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.

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. The 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 at (800) 426-4791 or online at www.epa.gov/safewater/lead.

Information on the Internet

The U.S. EPA Office of Water (www.epa.gov/watrhome) and the Centers for Disease Control and Prevention (www.cdc.gov) Web sites provide a substantial amount of information on many issues relating to water resources, water conservation, and public health. Also, the Virginia Department of Health, Office of Drinking Water, has a Web site (www.vdh.state.va.us/drinkingwater/index.htm) that provides complete and current information on water issues in Virginia, including valuable information about our watershed.

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 pipes by sending a rapid flow of water through the mains.

Flushing maintains water quality in several ways. For example, 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 and disinfectant levels, and an acceptable taste and smell.

During flushing operations in your neighborhood, some short-term deterioration of water quality, though uncommon, is possible. You should avoid tap water for household uses at that time. 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.

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 or ext 232

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 issues 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 where 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 next 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 a 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 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 where 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.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised 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 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 online at http://water.epa.gov/drink/hotline.

Naturally Occurring Bacteria

The simple fact is, bacteria and other microorganisms inhabit our world. They can be found all around us: in our food, on our skin, in our bodies, and in the air, soil, and water. Some are harmful to us and some are not. Coliform bacteria are common in the environment and are generally not harmful themselves. The presence of this bacterial form in drinking water is a concern because it indicates that the water may be contaminated with other organisms that can cause disease. Throughout the year, we tested many water samples for coliform bacteria. In that time, none of the samples came back positive for the bacteria.

Federal regulations require that public water that tests positive for coliform bacteria must be further analyzed for fecal coliform bacteria. Fecal coliform are present only in human and animal waste. Because these bacteria can cause illness, it is unacceptable for fecal coliform to be present in water at any concentration. Our tests indicate no fecal coliform is present in our water.

New Regulations

To strengthen the protection against disinfection by-products, the United States Environmental Protection Agency (U.S. EPA) promulgated the Stage 2 Disinfectant/Disinfection By-Product Rule (D/DBPR) in December 2005. The intent is to reduce peak total trihalomethane (TTHM) and haloacetic acid (HAA5) concentrations by changing the compliance monitoring locations implemented under the Stage 1 D/DBP Rule and to promote enhanced water quality within the distribution system. The maximum contaminant level (MCL) values remain the same at 80 parts per billion (ppb) and 60 ppb, respectively, but the results are based on a locational running annual average (LRAA) for each individual sample point in the distribution system. Beginning in May 2012, the City of Portsmouth implemented the Stage 2 D/DBP Rule to comply with state and federal regulations. If you would like additional information, please contact the Water Quality Lab at 539-2201 ext 232 or visit the EPA's Safe Drinking Water website at www.epa.gov/safewater/disinfection/stage2.

Sampling Results

Last year we collected 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 sample 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)	2012	15	0	1.7	NA	No	Erosion of natural deposits
Barium (ppm)	2012	2	2	0.027	NA	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Beta/Photon Emitters[1] (pCi/L)	2012	50	0	4.5	NA	No	Decay of natural and man-made deposits
Bromate (ppb)	2012	10	0	2.2	NA	No	By-product of drinking water disinfection
Chloramines (ppm)	2012	[4]	[4]	3.6	2.8–3.6	No	Water additive used to control microbes
Combined Radium[2] (pCi/L)	2012	5	0	0.4	NA	No	Erosion of natural deposits
Di(2-ethylhexyl) Phthalate (ppb)	2012	6	0	1.1	NA	No	Discharge from rubber and chemical factories
Fluoride (ppm)	2012	4	4	1.27	0.54–1.38	No	Erosion of natural deposits; Water additive that promotes strong teeth; Discharge from fertilizer and aluminum factories
Haloacetic Acids [HAAs] (ppb)	2012	60	NA	46	25–46	No	By-product of drinking water disinfection
Nitrate (ppm)	2012	10	10	0.06	ND–0.07	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes] (ppb)	2012	80	NA	63	43–63	No	By-product of drinking water disinfection
Total Organic Carbon (ppm)	2012	TT	NA	3.2	1.8–3.9	No	Naturally present in the environment
Turbidity[3] (NTU)	2012	TT	NA	0.12	0.04–0.12	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2012	TT	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)	2012	1.3	1.3	0.174	0/70	No	Corrosion of household plumbing systems; Erosion of natural deposits
Lead (ppb)	2012	15	0	<1	0/70	No	Corrosion of household plumbing systems; Erosion of natural deposits

OTHER REGULATED SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH	TYPICAL SOURCE
Alkalinity (ppm)	2012	102	61–128	Naturally occurring
Ammonia (ppm)	2012	0.40	NA	NA
Calcium Hardness (ppm)	2012	19.5	18–23	Naturally present in sedimentary rocks
Conductivity (umhos/cm)	2012	341	320–418	Naturally occurring
Hardness (ppm)	2012	26.7	15–29	Naturally occurring
Ortho-phosphate (ppm)	2012	0.11	NA	Occurs naturally in rocks and other minerals
Silica (ppm)	2012	4	NA	Naturally present in the environment
Total Sodium (ppm)	2012	80.5	57.5–83.9	Naturally occurring

SECONDARY SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	SMCL	MCLG	AMOUNT DETECTED	RANGE LOW-HIGH	VIOLATION	TYPICAL SOURCE
Aluminum (ppb)	2012	200	NA	137	NA	No	Erosion of natural deposits; Residual from some surface water treatment processes
Chloride (ppm)	2012	250	NA	19	NA	No	Runoff/leaching from natural deposits
Iron (ppm)	2012	0.3	NA	0.013	ND–0.08	No	Leaching from natural deposits; Industrial wastes
pH (Units)	2012	6.5-8.5	NA	7.8	7.3–7.9	No	Naturally occurring
Sulfate (ppm)	2012	250	NA	59	NA	No	Runoff/leaching from natural deposits; Industrial wastes
Total Dissolved Solids [TDS] (ppm)	2012	500	NA	258	222–269	No	Runoff/leaching from natural deposits

[1] The MCL for beta particles is 4 mrem/year. U.S. EPA considers 50 pCi/L to be the level of concern for beta particles.

[2] Amounted detected was for radium 226. Less than 0.9 pCi/L was detected for radium 228.

[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.

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.

micromhos: A measure of electrical conductance.

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

ND (Not detected): Indicates that the substance was not found by laboratory analysis.

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).

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