Annual WATER QUALITY REPORT

Reporting Year 2012

Presented By
Burlington DPW
Water Division

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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.

Community Participation

Call us at (802) 863-4501 for information about the next opportunity for public participation in discussions about our drinking water. Find out more about Burlington Public Works Water Division on the Internet at www.burlingtonvt.gov/dpw.

Where Does My Water Come From?

The City of Burlington is fortunate to have Lake Champlain as a source for our raw water. Lake Champlain extends from the Canadian border south along the western side of the state for nearly 120 miles. The City of Burlington is located near the widest portion of the lake. Our point of intake is located well beyond the Burlington Harbor, which prevents contaminants that may be present in the harbor from entering our system. The intake line is also located deep enough to prevent most surface contaminants from entering and to ensure a continuous supply of water even during the most severe drought conditions. The water entering our treatment plant is of high quality, which eliminates the need to treat for large numbers of contaminants to meet safe drinking standards.

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.

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 http://water.epa.gov/drink/hotline.

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 of your drinking water supply. The Water Division conducted 24 monthly samples beginning on April 14, 2008, and concluding on March 8, 2010.

Sampling of our water source has shown the following:

Cryptosporidium: (No (Oo)cysts/L detected.)

Giardia lamblia: (No (Oo)cysts/L detected.)

E. coli: (Two sample dates showed 1 *E. coli* per 100 mL. All others were less than 1.0.)

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

Questions?

For more information about this report, or for any questions relating to your drinking water, please call Tom Dion, Chief Plant Operator, at (802) 863-4501.

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. We are 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 www.epa.gov/safewater/lead.

Source Protection Plan

The Burlington Public Works Water Division obtains its raw water from Lake Champlain, a surface water source. Potential sources of contamination include urban and agricultural runoff and wastewater discharges. The Water Division source protection plan was updated on August 11, 2011, as required by the Vermont Water Supply Division. The report details possible sources of contamination as well as the risks associated with each. The completed plan is available for viewing by contacting the Water Division during regular business hours.

Water System Infrastructure Improvements

Replacement of 8 inch water main on Adams Street.

As part of our on-going investment into the infrastructure it is imperative that we can shut down water mains for servicing when breaks occur. This year we experimented with a valve that allows for installation under pressure. The picture above is of a 16 inch valve being installed on Lake Street. Another valve of similar design was installed on Main St at Battery.

What Causes the Pink Stain on Bathroom Fixtures?

The reddish-pink color frequently noted in bathrooms on shower stalls, tubs, tile, toilets, sinks, toothbrush holders, and on pets' water bowls is caused by the growth of the bacterium *Serratia marcesens*. Serratia is commonly isolated from soil, water, plants, insects, and vertebrates (including man). The bacteria can be introduced into the house through any of the above mentioned sources. The bathroom provides a perfect environment (moist and warm) for bacteria to thrive.

The best solution to this problem is to continually clean and dry the involved surfaces to keep them free from bacteria. Chlorine-based compounds work best, but keep in mind that abrasive cleaners may scratch fixtures, making them more susceptible to bacterial growth. Chlorine bleach can be used periodically to disinfect the toilet and help to eliminate the occurrence of the pink residue. Keeping bathtubs and sinks wiped down using a solution that contains chlorine will also help to minimize its occurrence.

Serratia will not survive in chlorinated drinking water.

Update on System Improvements from Chief Plant Operator Tom Dion

The past year presented few challenges in meeting both the federal and state water quality standards. The filter plant operated efficiently, with few operational problems occurring, and we had no violations with either water quality or reporting. We were once again awarded the Directors Award by the Partnership for Safe Water, for the eleventh year in a row. The water quality standards set by the Partnership are stricter than those set by the state or federal regulations, so we are proud of the recognition of our efforts.

We would like to draw your attention to the lead and copper sampling results and the upgrading of the secondary standards table. Lead and copper samples are required to be taken once every three years, so we were required to sample in 2012. The results of the most recent thirty samples showed just above a trace amount of copper in some samples and below the detection level for lead in all but one sample. The lead and copper levels for 2012 were better than 2009 and both were well below the maximum contaminant level (MCL). We have also updated the aesthetic-based water standards. These standards are not required testing, but due to numerous calls requesting the information, we will be upgrading the results in future reports.

I would like to take a moment to answer a question I am frequently asked. What disinfectant do we use in our drinking water? The answer is Sodium Hypochlorite (chlorine). We have used chlorine for the past one hundred years and it has served us well. Chlorine does form disinfection by-products when it contacts organics, and so far we have been able to stay below the MCL under the stage I rule. Starting next fall, the disinfection by-products MCLs will be harder to meet when we start stage II testing. We are working hard to maximize our filtration and current disinfection process to maintain low disinfection by-products. If we can accomplish our goal, we will continue to use chlorine; if not, we will have to look at other ways to meet the new standards.

Earlier in 2012, we were invited to participate in the UVM discussion on banning bottled water on campus. The University was looking for ways to create a more sustainable beverage system and eliminate the number of plastic bottles entering the waste system. We provided staff and students with water quality information concerning chemical additives, required testing, and results so they could make an informed decision between municipal and bottled water. I am pleased to announce that Burlington water quality was deemed equal to or better than bottled water and UVM banned the sale of bottled water on campus effective 1/1/13. At the time of this report, 75 of the 215 drinking water fountains now have bottle fillers.

In conclusion, I would like to state that we are proud of our water quality and we will continue to not only meet the water regulations but surpass them. If you have any questions, please contact us and we will be happy to answer them.

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 table below shows only those contaminants that were detected in the water. The state requires us to monitor for certain substances less 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
Fluoride[1] (ppm)	2012	4	4	0.74	0.52–1.05	No	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories
Haloacetic Acids [HAA]–Stage 1[2] (ppb)	2012	60	NA	42	35–55	No	By-product of drinking water disinfection
Nitrate (ppm)	2012	10	10	0.24	0.24–0.24	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes]–Stage 1[2] (ppb)	2012	80	NA	48	36–59	No	By-product of drinking water disinfection
Turbidity[3] (NTU)	2012	TT=< 1 NTU	NA	0.07	0.02–0.07	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2012	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[4]

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	0.050	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives
Lead (ppb)	2012	15	0	0	0/30	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
Aluminum (ppm)	2012	200	NA	0.040	0.040–0.040	No	Erosion of natural deposits; Residual from some surface water treatment processes
Chloride (ppm)	2012	250	NA	17	17–17	No	Runoff/leaching from natural deposits
Iron (ppm)	2012	300	NA	<0.020	<0.020–<0.020	No	Leaching from natural deposits; Industrial wastes
Manganese (ppm)	2012	50	NA	<0.020	<0.020–<0.020	No	Leaching from natural deposits
pH[5] (Units)	2012	6.5–8.5	NA	7.48	7.34–7.61	No	Naturally occurring
Silver (ppm)	2012	100	NA	<0.020	<0.020–<0.020	No	Industrial discharges
Sulfate (ppm)	2012	250	NA	12	12–12	No	Runoff/leaching from natural deposits; Industrial wastes
Total Dissolved Solids [TDS] (ppm)	2012	500	NA	95	95–95	No	Runoff/leaching from natural deposits
Zinc (ppm)	2012	5	NA	0.23	0.23–0.23	No	Runoff/leaching from natural deposits; Industrial wastes

OTHER SUBSTANCES

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AMOUNT DETECTED	RANGE LOW-HIGH
Alkalinity as CaCO3 (ppm)	2013	59	59–59
Calcium, Total (ppm)	2013	17	17–17
Hardness as CaCO3 (ppm)	2013	61	61–61
Langeliers Corrosivity (ppm)	2013	-1.82	-1.82—1.82
Sodium, Total (ppm)	2013	11	11–11

[1] Burlington has added fluoride to the water since 1952 to promote public health through the prevention of tooth decay. On January 7, 2011, the U.S. Department of Health and Human Services announced that they are proposing to change the recommended level for community fluoridation from a range of 0.7 ppm to 1.2 ppm to a single value of 0.7 ppm. The Burlington Water Department has reduced our fluoride to 0.7 ppm. For more information concerning fluoride, infant formula, and community water fluoridation, go to http//healthvermont.gov/family/dental/fluoride/formula.aspx.

[2] The amount detected value is the result of a four quarter running average. DPW conducted an evaluation of our distribution system to identify locations that have elevated disinfection by-product concentrations. As required by the EPA, in the last quarter of 2013 we will begin sampling at these locations and the average results will be based on location, versus system wide. Disinfection by-products (e.g. HAAs and TTHMs) result from continuous disinfection of drinking water and form when disinfectants combine with organic matter that naturally occurs in the source water.

[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.

[4] Lead and copper samples are required once every three years. Last sampled in 2012.

[5] Amount detected is the annual average.

Definitions

AL (Action Level): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which 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.

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.

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.