



*Annual* **WATER**  
**QUALITY**  
**REPORT**

*Reporting Year 2011*



Presented By \_\_\_\_\_  
**Burlington DPW**  
**Water Division**

PWS ID#: VT0005053

## Meeting the Challenge

We are once again proud to present our annual water quality report covering all testing performed between January 1 and December 31, 2011. 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 share with us your thoughts or concerns about the information in this report. After all, well-informed customers are our best allies.

## 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](http://www.burlingtonvt.gov/dpw). For more information about this report, or for any questions relating to your drinking water, please call Tom Dion, Chief Plant Operator

## 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>.

## 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;

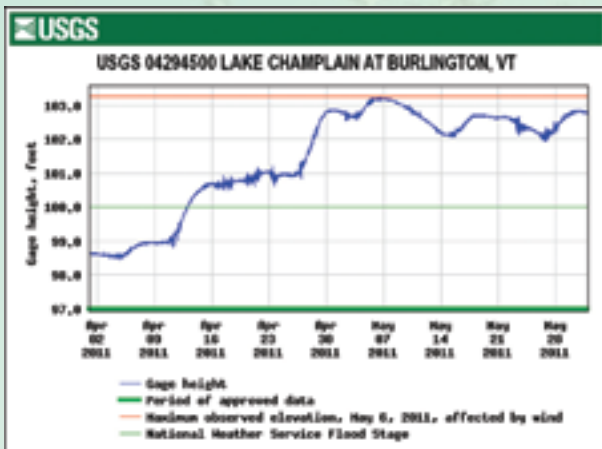
**Pesticides and Herbicides**, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses;

**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.

On May 6, 2011 Lake Champlain reached a new record high of 103.2 feet above sea level. Many of our buildings became surrounded by Lake Champlain but our biggest concern was the potential for rapid changes in lake water quality. Although the turbidity of the incoming raw water increased, the treatment plant operated as designed and we experienced no finished water quality issues.



## 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 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](http://www.epa.gov/safewater/lead).

## 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.

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 100ml. All others were less than 1.0.

One sample was taken each month. The required sample period was April 14, 2008, to March 8, 2010.

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.

## 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 Vermont Water Supply Division provided the resources and expertise to enable us to update our Source Protection Plan. A public hearing was held in December 2005, and the new plan was adopted and published on February 8, 2006. Our 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 site. The plan will be a valuable tool in protecting our source of potable water, and we thank the Vermont Water Supply Division for their assistance. The completed plan is available for viewing by contacting the Burlington Public Works Water Division during regular business hours.

## 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.

## 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. 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, 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.



## Mapping Project

The City is in the process of updating the Geographical Information System (GIS) database. Both contractual and in house staff have been in the field collecting various infrastructure data. The process involves driving a scooter around the City with a GPS antenna mounted and stopping at each catch basin, manhole, water valve and hydrant to get a satellite reading of its location. This data is important for planning improvements to the system, coordinating infrastructure work, and locating water valves for emergency isolation. In the future we will be able to record specific information like maintenance/repair history with each feature, thereby giving us a better understanding of the condition of our systems.

## Update on System Improvements from Chief Plant Operator Tom Dion

The past year presented few challenges to our finished water quality, and yet we were kept busy fighting mother nature, upgrading plant filters, planning for needed plant upgrades, and creating a more energy-efficient treatment plant. The record high lake level, this past spring, caused serious concern about plant operations. The parking lots and land surrounding the plant and pump station were flooded, requiring extensive sandbagging. Thankfully, a strong southwest wind failed to develop, and we averted a real flooding problem. Our construction crew saved the day, sandbagging doors, and no damage occurred to any part of the plant. I also want to thank them for cleaning up the mess after the lake receded.

A major project that was undertaken last spring was the rebuilding of our automatic backwash filter (ABW). The ABW is the first stage in the filtration process, eliminating most of the particles in the raw water. The anthracite media was in need of replacement, and the under drains needed to be repaired. A joint effort involving plant operators, water construction crew, and the street crew enabled us to get the job done in a couple of weeks. Rebuilding the filter was no small task because hundreds of bolts were replaced and tons of bagged anthracite needed to be manually carried into the filter. Again, I want to thank all areas of the Public Works Department for their assistance in getting the job done.

The coming year will be a continuation of projects that were started in 2011. We are looking at replacing one of our finished water pumps that is old and inefficient with a new energy-efficient pump. The new pump, in combination with a pump replaced earlier, will enable us to meet peak system demands at a lower cost. The other major concern that needs to be addressed is the replacement of our reservoir liners. The two reservoirs, which are capable of containing seven million gallons of water, are of vital importance to all users. The liners have more than outlived their 25-year life span and need to be replaced. Numerous inspections and repairs by both in-house personnel as well as independent contractors confirm the need for replacement. Estimates for replacing both the pump and the liner have been requested and a decision will be made in the near future.

Once again, we are required to sample 30 homes for lead and copper this summer. We are required to sample past participants once every three years. I would ask for your assistance once again if you have been sampled in the past. As in most years, some past sample sites do not respond to sample requests and new sites need to be found. If your home was built after 1982 and you want to be put on the backup list, please contact me at (802) 863-4501. There is no charge and little effort involved.

## Aesthetic Based USEPA Water Standards, Sampled March 10, 2011

Contaminant	USEPA Secondary Standard MCL mg/l	Finished water amount detected	Noticeable effects above MCL
Aluminum	0.05 to 0.2	0.038	Colored water
Chloride	250	17	Salty taste
Iron	0.3	<0.020	Rusty color, metallic taste
Manganese	0.05	<0.020	Black to brown color. Bitter taste
Silver	0.1	<0.020	Skin and eye discoloration
Total dissolved solids	500	93	Hardness, deposits, staining
Zinc	5.0	0.35	Metallic taste
Alkalinity as CaCO <sub>3</sub>	N/A	60	
Hardness as CaCO <sub>3</sub>	N/A	67	
Langelier's Corrosivity	Noncorrosive	-1.295	
Sulfate	N/A	11	
Calcium Total	N/A	19	
Sodium Total	N/A	11	
PH Finished water	Annual average	7.49	January 1, 2011 – December 31, 2011

**This is non-required testing but is information often requested by our customers.**

## 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 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 <sup>1</sup> (ppm)	2011	4	4	0.72	0.20–1.21	No	Water additive which promotes strong teeth
Haloacetic Acids [HAAs] <sup>2</sup> (ppb)	2011	60	NA	52	30–78	No	By-product of drinking water disinfection
Nitrate (ppm)	2011	10	10	0.24	NA	No	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
TTHMs [Total Trihalomethanes] <sup>2</sup> (ppb)	2011	80	NA	51	32–74	No	By-product of drinking water disinfection
Turbidity <sup>3</sup> (NTU)	2011	TT	NA	0.10	0.02–0.10	No	Soil runoff
Turbidity (Lowest monthly percent of samples meeting limit)	2011	TT	NA	100	NA	No	Soil runoff

Tap water samples were collected for lead and copper analyses from sample sites throughout the community<sup>4</sup>

SUBSTANCE (UNIT OF MEASURE)	YEAR SAMPLED	AL	MCLG	AMOUNT DETECTED (90TH% TILE)	SITES ABOVE AL/TOTAL SITES	VIOLATION	TYPICAL SOURCE
Copper (ppm)	2009	1.3	1.3	0.079	0/30	No	Corrosion of household plumbing systems; Erosion of natural deposits; Leaching from wood preservatives
Lead (ppb)	2009	15	0	2	1/30	No	Corrosion of household plumbing systems; Erosion of natural deposits

<sup>1</sup> 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 from 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>.

<sup>2</sup> 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 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.

<sup>3</sup> 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. The average filtered turbidity reading for 2011 was 0.039 NTU.

<sup>4</sup> Lead and copper samples are required once every three years. Last sampled in 2009.

## Definitions

**AL (Action Level):** The concentration of a contaminant which, 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.

**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.