2020 ANNUAL DRINKING WATER QUALITY REPORT

CITY OF BURLINGTON – PUBLIC WATER SYSTEM ID# 02-01-010

2020 Consumer Confidence Report - City of Burlington

The City of Burlington is pleased to present you with the 2020 annual Drinking Water Quality Report, also known as the **Consumer Confidence Report (CCR)**. This report provides our customers with a snapshot of 2020 water quality. This report includes details about where your water comes from, what it contains, and how it compares to standards set by regulatory agencies. During the calendar year 2020, The City of Burlington delivered an average of 10.806 million gallons of water per day through approximately 441 miles of water lines. The maximum day was on Wednesday, July 22 when over 15.948 million gallons of water was pumped into the distribution system. The City's goal is to provide our citizens with an uninterrupted supply of safe and high-quality drinking water. We want you to understand the effort we make to continually improve the water treatment process and protect our water resources. We are committed to ensuring the quality of your water and to providing you with this information. If you have any questions about this report or concerning your water, please contact the Water Resources Department at (336) 222-5133. The Burlington City Council meets on the first and third Tuesday of each month. You may also log on to EPA's website at http://www.epa.gov/ccr for general CCR information.

WHAT EPA WANTS YOU TO KNOW

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 Environmental Protection Agency's safe Drinking Water hotline (800-426-4791).

Some people may be more vulnerable to contaminants in drinking water than the general population. Immune-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplant, 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/CDC guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

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 City of Burlington is 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 minimizes exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

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 virus and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife; 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; 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 can also come from gas stations, urban stormwater runoff, and septic systems; and 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, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water system. FDA regulations establish limits for contaminants in bottle water, which must provide the same protection for public health.

SOURCES WATER ASSESSMENT PROGRAM (SWAP) RESULTS

The City of Burlington utilizes two (2) surface water supply sources. Lake Mackintosh is located in Southwest Alamance County and Southeast Guilford County. It supplies the J.D. Mackintosh, Jr. Water Treatment Plant (JDMWTP) located in Southwest Alamance County. Stoney Creek Reservoir is located near the Hopedale community. It supplies the Ed Thomas Water Treatment Plant (ETWTP) located in downtown Burlington.

The most recent source water assessment was prepared by the North Carolina Department of Environmental Quality (NCDEQ). Source Water Assessments were performed on Stoney Creek Reservoir and Lake Mackintosh and were updated in September 2017. These assessments indicate that Stoney Creek Reservoir has a susceptibility rating of "Moderate" and Lake Mackintosh has a susceptibility rating of "Higher". You can find more information about the NCSWAP program online at http://www.ncwater.org/?page=600&Action=Swap_Search.

DEFINITIONS & ABBREVIATIONS

AL **ACTION LEVEL:** The concentration of a contaminant that, if exceeded, triggers treatment or other requirements, which a water system must follow.

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.

MCL **MAXIMUM CONTAMINANT LEVEL:** The highest level of a contaminant allowed in drinking water. MCLs are set as close the MCLGs as feasible using the best available treatment technology.

µg/L **MICROGRAM PER LITER:** A measure of mass per unit volume to express the concentration of a solution, also referred to as "parts per billion" – often abbreviated as ppb.

mg/L **MILLIGRAM PER LITER:** A measure of mass per unit volume to express the concentration of a solution, also referred to as "parts per million" – often abbreviated as ppm.

pCi/L **PICOCURIES PER LITER**: A measure of radioactive intensity per unit volume

ng/L **NANOGRAM PER LITER:** A measure of mass per unit volume to express the concentration of a solution, also referred to as "parts per trillion" – often abbreviated as ppt.

MFL **MILLION FIBERS PER LITER:** A measure of the amount of asbestos per unit volume.

NTU **NEPHELOMETRIC TURBIDITY UNIT:** A measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person

SMCL **SECONDARY MAXIMUM CONTAMINANT LEVEL:** The highest concentration of a contaminant based on apparent quality such as color, odor, or taste, but does not imply any known health effects.

TT **TREATMENT TECHNIQUE:** A required process intended to reduce the level of a contaminant in drinking water.

ND **NOT DETECTED:** This term is used when the concentration of a substance is too low to be detected by standard lab tests.

NA **NOT APPLICABLE:** Information does not apply to this parameter

JUST HOW MUCH ARE ONE PART PER MILLION, ONE PART PER BILLION, ONE PART PER TRILLION?

The concentrations of substances measured in drinking water are usually expressed as parts per million (ppm), parts per billions (ppb) or even parts per trillion (ppt). It is often difficult to grasp just how large a million, a billion or a trillion really is. We have included some examples to provide perspective on how large numbers like 1 million, 1 billion and 1 trillion are:

Part Per Million (ppm) or milligram per liter (mg/L) – One part per million corresponds to 1 one minute in two years or a penny in $10,000

Part Per Billion (ppb) or microgram per liter (µg/L) – One part per billion corresponds to 1 one minute in 2,000 years or a single penny in $10,000,000

Part Per Trillion (ppt) or nanograms per liter (ng/L) – One part per Trillion corresponds to 1 one minute in 2,000,000 years or a single penny in $10,000,000,000,000.

VIOLATIONS THAT YOUR WATER SYSTEM RECEIVED FOR THE REPORT YEAR

The City of Burlington is required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not our drinking water meets health standards. The City of Burlington had no violations of Drinking Water standards in 2020.

A **"Monitoring Violation"** means that water was not tested within the appropriate timeframe.

A **"Reporting Violation"** means that the samples were analyzed, but the results were either not reported or reported incorrectly.

Inorganic Compounds

The USEPA has set standards for a number of inorganic chemicals that can affect our health. Inorganic contaminants in source water such as salts and metals, can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Parameters	MCLG	Federal MCL	JDMWTP	ETWTP	Range	Major Sources in Drinking Water
Barium (mg/L)	2	2	ND	ND	ND	Erosion of natural deposits; Discharge from metal refineries
Fluoride #	4	4	0.80	0.80	0.6 - 1.0	Added to water to promote strong teeth
Nitrate (mg/L)	10	10	ND	ND	ND	Runoff from fertilizer use: Leaching from septic tanks, sewage; erosion of natural deposits.
Cyanide (µg/L)	200	200	Less than 200	Less than 200	Less than 200	Discharge from steel, plastic and / or fertilizer factories

Fluoride analysis is conducted every 4 hours for process control purposes. The fluoride analysis reported in this Water Quality Report are certified results from a sample collected on 6/10/2020.

Disinfectant Residuals Summary

In July of 2011, the City of Burlington made the transition from FREE CHLORINE as a secondary disinfectant to a combined form of chlorine called CHLORAMINES. This was a highly publicized event. This change resulted in better maintained chlorine residual in the city's distribution system, fewer taste and odor complaints and lower Disinfection By-Product (DBP) formation. There is a difference in the regulatory requirements for Chloramine versus Free Chlorine. The minimum allowable concentration of **free chlorine** is 0.2 mg/L. The minimum allowable concentration for **chloramines** is 1.0 mg/L. The maximum residual disinfectant level for both free chlorine and chloramine is 4.0 mg/L. The City of Burlington uses free chlorine as a primary disinfectant (at the plant) and chloramines as a secondary disinfectant (in the distribution system) to control microbial growth.

Parameters	MRDL Violation Y/N	Your water (Highest RAA)	Range		MRDLG	MRDL	Likely Source of Contamination
			Low	High			
Chlorine (mg/L)	N	2.47	0.51	3.50	4.0	4.0	Water additive used to control microbes
Chloramine (mg/L)	N	2.30	1.00	4.00	4.0	4.0	Water additive used to control microbes

Organic Compounds

There are a number of organic compounds that are of potential concern in drinking water. This group includes Volatile Organic Compounds (VOC's), which vaporize easily, and Synthetic Organic Compounds (SOC's), which are manmade, such as some pesticides and herbicides. These contaminants may come from sources like agriculture, urban stormwater runoff, residential uses, industrial processes and petroleum production, gas stations, and septic systems. Trihalomethanes and Haloacetic acids are disinfection byproducts that are formed when organic compounds that are in water react with chlorine used to disinfect drinking water. These disinfection by-products are made up of several components. None of the individual components of these disinfection byproducts are regulated. However, the sum of these components is regulated and is included in the table below.

On April 1, 2012, The City of Burlington became subject to what are commonly referred to as the Stage 2 Disinfection Byproduct Rules, or the Stage 2 DBP rules. **Under the new Stage 2 DBP rule**, compliance with the rule is calculated by averaging the four quarterly results for **each** of the 8 different sample locations. If the 4-quarter average for any of the 8 sample locations exceeds the compliance limit for any of the Disinfection By-Products, the entire water system is considered out of compliance with the Stage 2 DBP rule, and a public notification must be sent to customers.

Parameters	MCLG	Federal MCL	Burlington Water System	Major Sources in Drinking Water	Health Effects
Total Trihalomethanes (µg/L) 4-Quarter Average	NA	80	38.4	By-product of drinking water chlorination	Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.
Range of TTHM for 2020 (µg/L)			15 - 72	This is the range (lowest and highest) of all compliance values for TTHM samples reported in 2020	
Total Haloacetic acids (µg/L) 4-Quarter Average	NA	60	39.7	By-product of drinking water chlorination	Some people who drink water containing haloacetic acids in excess of the MCL over many years may have an increased risk of getting cancer.
Range of HAA5 for 2020 (µg/L)			15 - 56	This is the range (lowest and highest) of all compliance values for HAA samples reported in 2020	

All sample locations were in compliance with the Stage 2 DBP rules in 2020.

Pesticides & Synthetic Organic Compounds

These contaminants may come from sources like agriculture, urban stormwater runoff, residential uses, industrial processes and petroleum production, gas stations, and septic systems.

The City of Burlington is required to test for 26 Pesticides and Synthetic Organic Compounds at both water treatment plants every three years. The last test for these compounds was conducted in March, August, and November of 2019. **There were No Synthetic Organic Chemicals or Pesticides detected** in samples analyzed during the most recent round of testing. **The next round of testing is scheduled to be conducted in 2022.**

Lead & Copper

USEPA requires that the City perform household testing in accordance with the 1994 Lead and Copper Rule. According to that rule, 90% of the samples taken from locations in Burlington identified as "high risk" must have less than 15 parts per billion (ppb or ug/L) of lead and less than 1,300 parts per billion (ppb or ug/L) of copper. These sample locations are classified as "high risk" because they were constructed using copper pipe and lead solder as components in the plumbing system. New building codes and regulations no longer permit houses to be built using these components. Testing in **2018** indicated that the average concentration of lead in these "high risk" homes was less than 3 ppb, and the average concentration of copper was less than 50 ppb, both well below the regulatory limits. Lead and copper samples are collected by the homeowner and analyzed by a certified laboratory. Samples are collected after the water has been left undisturbed in the household plumbing for an extended period of time. This is intended to collect a water sample that represents the "worst case" for lead and copper. **The next scheduled round of Lead and Copper sampling will occur between June 1 and September 30, 2021**.

Parameters	MCLG	Action Level	Max	Average result from Tier 1 sites in Burlington		Major Sources in Drinking Water
				Average	90th Percentile	
Lead (µg/L)	0	15	33.0	<3	<3	Corrosion of household plumbing systems; Erosion of natural deposits.
Copper (µg/L)	1,300	1,300	483	<50	73	Corrosion of household plumbing systems; Erosion of natural deposits.

Microbiological

Microbial contaminants in the source water, such as viruses and bacteria, may come from sewage treatment plants, septic systems, agricultural livestock and wildlife. The physical processes and disinfection chemicals used during the treatment process effectively eliminate harmful organisms that may be in the untreated water. Microbiological testing is performed daily to assure the absence of these organisms and to monitor the efficiency of these treatment techniques. Total Coliform and E. coli tests are performed on samples taken from the treatment plants, homes, and businesses throughout the City.

Parameters	MCLG	Federal MCL	Burlington Water System Average	JDMWTP	ETWTP	Major sources in Drinking Water
Total Coliform* (see note)	0	<5.0 % of samples	<0.5%	NA	NA	Naturally present in the environment
E. Coli	0	0	0.0%	NA	NA	Human and animal fecal waste
Average CFE Turbidity **	NA	TT	NA	0.05	0.05	Soil runoff
Maximum Turbidity**	NA	TT	NA	0.17	0.16	Soil runoff

100% of Combined Filter Effluent (CFE) water samples tested for turbidity in 2020 were below 0.3 NTU.

*Total coliform samples are samples that are taken from homes and businesses in the distribution system. There were 720 samples collected in 2020. There was zero (0) sample tested positive for total coliform.

**Turbidity is measured at multiple locations throughout the treatment process.

The turbidity reported above represents Combined Filter Effluent (CFE) turbidity. 100% of all turbidity samples were below the limit. To meet current turbidity requirements, water must be less than 0.3 Turbidity Units **95% of the time** and **never** allowed to exceed 1.0 Turbidity Units. **Turbidity itself has no health effects**. However, turbidity can interfere with the disinfection process and provide a medium for microbial growth. Turbidity may indicate the presence of disease-causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

Radiological Contaminants

Radioactive contaminants in source water may be naturally occurring or may be the result of oil and gas production and mining activities. The table is based on samples collected in 2016.

Parameters	Last Test	MCLG	Federal MCL	Burlington Water System	Major Sources in Drinking Water
Gross Alpha (pCi/L)	2017	0	15	ND	Erosion of natural deposits
Uranium (pCi/L)	2017	0	20.1	ND	Erosion of natural deposits
Combined Radium (pCi/L)	2017	0	<1.0	N/A	Erosion of natural deposits

Total Organic Carbon (TOC)

Plants	TT Violation Y/N	Average Raw Water TOC mg/L	Average Finished Water TOC mg/L	TOC Removal Rate %	Range Lowest %	Range Highest %	MCLG	Likely Source of Contamination	Compliance Method (Step 1 or ACC#__)
JDMWTP	N	6.71	2.10	68.66	60.00	73.77	NA	Naturally present in the environment	Step 1
ETWTP	N	7.11	2.43	65.84	61.19	72.49	NA	Naturally present in the environment	Step 1

Secondary Standards

Secondary standards are non-enforceable standards that assure that your water meets standards of appearance, odor, and taste. These aesthetic contaminants normally do not affect the safety of your water.

Parameters	SMCL	JDMWTP	ETWTP	System Range	Major sources in drinking water
Iron (µg/L)*	300	Less than 60	Less than 60	NA	Naturally occurring
Manganese (µg/L)*	50	Less than 10	Less than 10	NA	Naturally occurring

*Data reported for Iron and Manganese was taken from 3rd party analysis of inorganic chemicals conducted on 06/10/2020. Iron and manganese are tested regularly for process control. Those process control results are not included in this report.

Cryptosporidium sp.

Cryptosporidium sp. is a microscopic organism that, when ingested, can cause diarrhea, fever, and other gastrointestinal symptoms? The organism occurs naturally in surface waters (lakes and streams) and comes from animal wastes. *Cryptosporidium sp*. is eliminated by an effective treatment combination of coagulation, sedimentation, filtration, and disinfection. Both City's water supply reservoirs underwent a 2-year sampling program to evaluate the water supplies for this organism. The City of Burlington completed monthly sampling at both reservoirs for 2 months in 2017 (This sampling program began in 2015 and consisted of a total of 24 samples). Each sample was sent to a certified lab for analysis.

The most recent sampling occurred between January 1, 2017 through December 31, 2017 – 2 samples at each reservoir. The results are listed below.

Location	Samples Collected	Total oocysts detected	Average Concentration	Concentration Requiring Additional Treatment
Stoney Creek Reservoir	2 (20 Liters)	0 oocysts	0.000 / Liter	0.075 oocysts / Liter
Mackintosh Reservoir	2 (20 Liters)	0 oocysts	0.000 / Liter	0.075 oocysts / Liter

Other Physical and Chemical Information

The following information is derived from routine analyses and is included for your information. These parameters are not regulated under the Safe Drinking Water Act and may vary widely between systems. Unless otherwise noted with an asterisk (*), all results in this table are system averages that were reported on monthly operation reports.

Parameters	JDMWTP	ETWTP
Alkalinity, mg/L as $CaCO_3$	29	33
Carbon Dioxide	2.7	5.8
Orthophosphorus, µg/L (minimum required: 500)	950	900
pH*, (Standard Units)	8.3*	8.5*
Sodium (mg/L)*	19.6*	19.8*
Sulfate (mg/L)*	28*	28*
Hardness (mg/L)	32	31
Hardness (Grains/Gal)	1.9	1.8

*Data reported was taken from 3rd party analysis of inorganic chemicals conducted on 6/10/2020.
Divide Hardness expressed as mg/L by 17.1 to obtain Grains/Gallon

Unregulated Contaminant Monitoring Rule Sampling (UCMR4)

The UCMR requires water systems to collect and analyze water samples for 28 chemicals and 2 viruses that are **currently not regulated**. The results of these samples help to guide EPA in setting future drinking water regulations. The results of the most recent UCMR4 data are included in the table below. This table only includes data for UCMR4 parameters that were **detected**. The UCMR4 list was developed by EPA and includes compounds for potential regulation to determine their relative occurrence around the country.

UCMR 4 Parameters	JD Mackintosh WTP		Ed Thomas WTP		Distribution System		Year Tested
	Average	Range	Average	Range	Average	Range	
Managanese, µg/L	16.8	2.22 – 49.8	17.3	7.7 – 35.5	NA	NA	2018
Quinoline, µg/L	ND	ND	23.7	20.2 – 27.0	NA	NA	2018
Source Water TOC, ppb	6,428	5,530 – 7,950	7,525	6,320 – 8,720	NA	NA	2018
Source Water Bromide, ppb	20.9	20 – 21.8	ND	ND	NA	NA	2018
Haloacetic Acids-9, ppb	NA	NA	NA	NA	44.8	28.8 – 55.9	2018
Anatoxin-a*, ppt	38.6	41.7 – 74.1	39.1	35.8 – 40.8	NA	NA	2019

***Anatoxin-a:** 3 of 8 samples from the Ed Thomas plant had detectable levels and 2 of 8 samples from the JD Mackintosh plant had detectable levels of Anatoxin-a.

Individuals may obtain the analytical results and health information for UCMR4 data by contacting the City of Burlington Water Resources Department at (336) 222-5133. For more information on the UCMR4, please visit the EPA website at: https://www.epa.gov/sites/production/files/2018-10/documents/ucmr4-data-summary.pdf

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