2020 ANNUAL DRINKING WATER QUALITY REPORT

A SUMMARY OF 2019 WATER QUALITY DATA

LOCATION AND DESCRIPTION OF WATER SOURCE

City of Ithaca Water System (City or CIWS)

Six Mile Creek is the source of water for the City of Ithaca. Water flows by gravity from the 60 foot reservoir to the water treatment plant at 202 Water St. The forested watershed is 46.4 square miles in size. The system serves most of the residents of the City of Ithaca and supplies Town of Ithaca customers along Taughannock Boulevard.

Governance over the utility falls to both the Board of Public Works and Common Council. The Board of Public Works meets on the third Tuesday of the month at 6pm. Common Council meets the first Wednesday of the month at 6 pm. All meetings are usually held in Council Chambers on the third floor of City Hall, 108 East Green St. However, while New York State is on Pause, Common Council and Board of Public Works meetings are being conducted remotely via the teleconferencing tool Zoom. The public is invited to join the Zoom meetings for legal public hearings only. Otherwise, the public can watch the meetings on the City of Ithaca's Public Meeting YouTube Channel by searching for "City of Ithaca" in YouTube (or see information on page 2). Check the City's website or with the Clerk's office for the agenda for these meetings. The public is invited to comment on topics of interest at the meetings by submitting a public comment form here: https://www.cityofithaca.org/FormCenter/.

Special Note

With the coronavirus (COVID-19) pandemic impacting communities throughout the world, your water professionals are working around the clock to ensure that safe, reliable water service continues to flow. EPA recommends that Americans continue to use and drink tap water as usual. The World Health Organization has stated that the, "presence of the COVID-19 virus has not been detected in drinking-water supplies and based on current evidence the risk to water supplies is low." Further, EPA's drinking water regulations require treatment at public water systems to remove or kill pathogens, including viruses.

This report

The Annual Water Quality Report is designed to provide consumers with information on the quality of the water delivered by their public water system and to raise awareness of the need to protect our drinking water sources. To comply with State regulations, this report must be issued annually. This is an overview of last year's water quality including details about where your water comes from, what it contains, and how it compares to State standards. If you have questions about this report or your drinking water, please contact us at the numbers listed below or you may attend any of the regularly scheduled public meetings.

Contacts for additional information or to arrange a tour:

Nathaniel Carman, Chief Operator, 273-4680, ext. 4602, ncarman@cityofithaca.org

Roxanna Johnston, Watershed Coordinator, 273-4680, ext.4619, rjohnston@cityofithaca.org

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TABLE OF CONTENTS

A. Water Treatment Processes, pg. 2

B. Health Effects and Individuals at Risk, pg. 2

C. Water Quality Data Definitions, and Special Items of Note, pgs. 3-4

D. General Water Information (Tables 1 & 2), pg. 5

E. Water Conservation Measures, pg. 5

F. Major Modifications, Future Projects and Capital Improvements, pg. 6

G. Detected Contaminants (Table 3), pgs. 7-8

H. Non-Detected Contaminants (Table 4), pg. 9

I. UCMR (Tables 5 & 6), pg.10

J. Security Concerns, pg. 11

K. Source Water Protection, pg. 11

L. Map of Water System Zones, pg. 12

M. Water Odor Information, pg. 13-14

A. WATER TREATMENT PROCESSES

PRE-TREATMENT: A coagulating agent is added to the water to remove impurities. Oxidants are added to destroy micro-organisms, reduce disinfection byproducts and treat inorganics.

MIXING: The water is rapidly mixed to distribute the treatment chemicals evenly.

COAGULATION AND FLOCCULATION: The water flows into large basins where the coagulants bind with impurities in the water (coagulation) causing them to form larger, heavier particles called floc (flocculation).

SEDIMENTATION: Flocculated water flows into basins where the floc particles settle to the bottom, thereby removing impurities and chemicals from the water.

FILTRATION: As of 2016, the WTP switched to membrane filtration. Membrane filtration is a pressure driven process that uses a porous membrane to separate particulate matter from soluble elements in water. The settled water is pushed through 0.1 micron pores in our membrane filtration system.

POST-TREATMENT: Chlorine is added to inhibit bacterial growth in the distribution system. A corrosion inhibitor is also added to the water to reduce the corrosivity of water toward metal plumbing materials, especially lead and copper, by forming a protective coating on the interior surface of these materials

Other Information:

Water & Sewer Operations Contact:
Erik Whitney, Assistant Superintendent of Water and Sewer Operations. Phone: 607-272-1717

City Of Ithaca YouTube Channel:
https://www.youtube.com/channel/UC7RtJN1P_RFaFW2IVCnTrDg

Landlords: If you need extra copies to distribute to your tenants please contact the water plant at 607-273-4680.

For water information and activities for children:
Water.epa.gov/learn/kids/drinkingwater/

Drinking water regulations:
www.health.ny.gov/environmental/water/drinking/regulations/

B. HEALTH EFFECTS AND INDIVIDUALS AT RISK

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 EPA's Safe Drinking Water Hotline (1-800-426-4791).

Some people may be more vulnerable to disease causing microorganisms or pathogens in drinking water than the general population. Immuno-compromised 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 can be particularly at risk from infections. These people should seek advice from their health care provider about their drinking water. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium, Giardia and other microbial pathogens are available from the Safe Drinking Water Hotline (800-426-4791).

No trace of either of these pathogens has been detected in previous UCMR testing of the treated water for the City of Ithaca. Since the City switched to membrane filtration, it is exempt from current testing requirements because these pathogens cannot pass through the membranes. In the future the City could be asked to resample, per the State and EPA. Individuals who think they may have one of these illnesses should contact their health care provider immediately.

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 activities. Contaminants that may be present in source water include: microbial contaminants; inorganic contaminants; pesticides and herbicides; organic chemical contaminants; and radioactive contaminants.

For additional information please contact the Tompkins County Health Department, 55 Brown Road, Ithaca, NY 14850 or by phone at 274-6688.

C. WATER QUALIITY DATA

INTRODUCTION:

To ensure that tap water is safe to drink, the State and EPA prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. State Health Department and Federal Drug Administration regulations also establish limits for contaminants in bottled water, which must provide similar protection for public health.

In accordance with State regulations, the City system routinely monitors your drinking water for numerous contaminants. Table 3 (page 7) shows the analytical test results for contaminants that were detected. These results are compared to the applicable state guideline or maximum contaminant level (MCL). Table 4 (page 9) shows the contaminants that were not detected in your water. The State allows testing less frequently than once per year for some contaminants since the concentrations of these contaminants do not change frequently. Therefore some data, though representative, are more than one year old.

LEAD AND COPPER:

In 2016, the Tompkins County Health Department determined that the modifications to the treatment process required the City to restart sampling for the Lead & Copper Rule as if it were a new system. As part of the continued sequence of testing for this rule, the City collected 31 samples from houses with known lead service lines in 2019. The City's results, in 2019, were under the Action Limit (AL) set in the Lead and Copper Rule. For an exceedance to occur, the concentration of lead would have to be greater than 15 ug/L in more than ten percent (90th percentile) of the collected water samples during the monitoring period. Only two (out of 31) sample results for lead were above 15 micrograms per liter (ug/L) in 2019. No sample sites were above the AL of 1.3 milligrams per liter (mg/L) for copper.

The City will not be required to perform another round of sampling until 2022 unless the Revised Lead and Copper rule dictates otherwise.

SODIUM:

People who are on severely restricted sodium diets should not drink water containing more than 20 mg/l of sodium. The City's average level of sodium for 2019 was 32 mg/l and has been consistently above 20 mg/l for the several years. Customers on severely restricted sodium diets might wish to consult with their health care providers. People on moderately restricted sodium diets should not drink water containing more than 270 mg/l of sodium.

MANGANESE:

EPA does not regulate manganese, rather, it is considered a nuisance chemical that may create aesthetic, cosmetic or technical problems. EPA developed a secondary guidance standard of 0.05 mg/L to minimize those problems. The World Health Organization uses 0.04 mg/L as the upper limit for drinking water. Most manganese is ingested in food, particularly vegetables. The EPA and WHO standards reflect this balancing of food and water manganese intake. New York State's Department of Health does have a health limit of 0.3 mg/L. The infant population is of greatest concern as they process manganese differently.

As a result of the record-breaking drought in 2016, the City learned that the source water from the reservoir can experience high levels of manganese. Due to this discovery, monitoring and treatment for manganese is ongoing. Changing reservoir conditions increase the likelihood of manganese releasing from sediments. Higher manganese levels are experienced during the warm seasons (warmer water temperatures). Treatment includes the use of sodium permanganate ($NaMnO_4$) and chlorine dioxide (ClO_2, added in 2017). There were no regulatory issues for manganese in 2019.

C. WATER QUALIITY DATA CONTINUED

CHLORINE DIOXIDE RESIDUAL/CHLORITE:

The chlorine dioxide feed system has been in use since August 2017. Chlorine dioxide is added to the source water as it enters the water treatment plant. A disinfection byproduct of feeding this chemical is chlorite. The city is required to monitor the entry point to the distribution system (plant effluent) for chlorite and a chlorine dioxide residual daily. In addition, three specific sites are sampled out in the distribution system monthly for chlorite as part of the regulations.

Monthly chlorite samples are sent to our contract laboratory who then subcontracts the chlorite analysis to another lab. On December 2nd, the City received notice that the subcontracted lab had equipment issues and our samples from the beginning of November (2019) were not analyzed within the required holding times. As a result, the City had a monitoring violation for chlorite for the month of November. This serves as the public notice requirement for this monitoring violation (Tier 3) which is annually. The City immediately contacted the lab about improving communication processes and heightened awareness to the importance of being notified within the same month so the City can resample and avoid violations.

ODORS:

As a direct result of feeding chlorine dioxide, there can be detectable odors as the residual in the water gets aerated at a customer's tap and reacts with nearby odors within the residence. The type of odors that can be noticed (from the literature on chlorine dioxide) are chemical, chlorine, diesel fuel, metallic, and when new carpet, furniture or drapes are present – a cat urine type odor. As fumes within the residence decline so should the resulting odors. Please note that different people, even within the same household, may notice different odors or none at all. Check out our website or Facebook for more information. Additionally, there is an odors section at the end of this report.

UNREGULATED CONTAMINANT MONITORING RULE #4 (UCMR4): The UCMR4 results are a primary source of information on occurrence and levels of contaminant exposure that the EPA uses to develop regulatory decisions for contaminants in the public drinking water supply. As part of the rule, the City has to sample for the contaminants under List 1. List 1 includes (2) metals, (9) pesticides, (3) alcohols, (3) semi-volatiles, (3) brominated haloacetic acid groups and specific cyanotoxins. Presence of cyanotoxins above a specific level in the initial screening triggers further testing. Cyanotoxins are related to algae blooms in the surface waters.

The sampling period for the City started in December 2018 and ended September 2019. The data is available on page 10. The data from past years data can be found on previous AWQRs on the City's website. More information on this rule can be found on the EPA's website (www.epa.gov/dwucmr).

COMMON WATER QUALITY DEFINITIONS:

ALKALINTY: Is a measure of the capability of water to neutralize acids. Bicarbonates, carbonates and hydroxides are the most common forms of alkalinity.

HARDNESS: Is a measure of the calcium and magnesium content of natural waters. The harder the water, the greater the tendency to precipitate soap and to form mineral deposits. Alkalinity and hardness occur naturally due to the contact of water with minerals in the earth's crust.

pH: Indicates how acidic or alkaline a water sample is. A value of 7 is neutral; 0-6 is acidic; and 8-14 is alkaline.

TOTAL ORGANIC CARBON (TOC): Is a measure of the organic content of water. A high concentration of TOC in water may lead to high levels of disinfection byproducts.

TURBIDITY: Is a measure of the cloudiness of water. It is an indication of the effectiveness of water treatment. NYS regulations require that treated water always be below 1.0 NTU (Nephelometric Turbidity Unit). For filtered water systems, 95% of the composite effluent samples (from the filtration process) must be less than 0.3 NTU.

TOTAL COLIFORMS: Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, bacteria may be present.

D. GENERAL WATER INFORMATION

Table 1: General Water Data-2019	
Public water supply ID #	0066600
Water System	CIWS
Water Source	Six Mile Creek
Approximate Population Served	30,000
Number of Service Connections	5450
Total Production in 2019 (MG)	782
Average daily delivered or production (MGD)	2.14
Average daily consumption (MGD)	1.98
Average Daily Lost (MGD)	0.16
2019 annual charge for water/1000 gal.	$10.53
Avg. Daily lost = production minus consumption MG = Million Gallons MGD = Million Gallons Per Day	

Table 2: General Water Quality Data - 2019 CIWS Annual Averages		
Analyte	**Units**	**Average**
pH (EP)	SU	7.5
Turbidity (EP)	NTU	0.04
Turbidity (POU)	NTU	0.3
Total Hardness	mg/l	119
Total Alkalinity	mg/l	93
Total Dissolved Solids	mg/l	183
Chlorine Residual (EP)	mg/l	2.1
Chlorine Residual (POU)	mg/l	1.14
Ortho Phosphate (EP)	mg/l	0.46
EP = Entry Point POU = Point of Use		

E. WATER CONSERVATION MEASURES

Although our system has an adequate amount of water to meet present and future demands, here are some reasons why it is important to conserve water:

- Saving water saves energy
- Saving water reduces the cost of energy required to pump water and eliminates the need to construct additional pumping systems and water towers; and
- Saving water lessens the strain on the water system during a dry spell or drought, helping to avoid severe water use restrictions so that essential firefighting needs are met and aquatic organisms are less stressed.

You can play a role in conserving water by becoming conscious of the amount of water your household is using, and by looking for ways to use less whenever you can. It is not hard to conserve water. Conservation tips include:

- Automatic dishwashers use 15 gallons for every cycle, regardless of how many dishes are loaded. So get a run for your money and load it to capacity.
- Check your toilets for leaks by putting a few drops of food coloring in the tank, watch for a few minutes to see if the color shows up in the bowl. It is not uncommon to lose up to 100 gallons a day from one of these otherwise invisible toilet leaks. Fix it and you save more than 30,000 gallons a year.
- Use your water meter to detect hidden leaks. Simply turn off all taps and water using appliances, then check the meter after 15 minutes. If it moved, you have a leak.
- Consider capturing roof runoff in a rain barrel to save for later use on lawns, gardens, and indoor plants.

F. MAJOR MODIFICATIONS (COMPLETED IN 2019)

Water Treatment Plant:

A. Water Project: Continued work for Contract 1
   - Sediment sampling plan for dredging spoils disposal was approved by DEC. RFP issued for sediment sampling
B. Upgraded two in-line turbidimeters to newer model capable of higher accuracy
C. Phase monitoring installed on the air compressors that power our membrane filtration
D. Rhomboid covers were installed on both gravity thickeners at our waste handling facility. These covers improve both the overall water quality leaving the facility, and the mechanical functions of the thickeners.
E. Installed new softstart devices on pump #1 (Vinegar Hill Pump Station) and pump#6 (Water Treatment Plant)

Distribution System:

A. 2293 feet of water main replaced or installed, mostly on College Ave, Cayuga St, and S. Aurora St
B. Dome on Coddington Rd water tank was replaced
C. The Raw Water Line Stabilization Project was completed in the fall of 2019 to reinforce two sections of the raw water main. At the first location, rock anchors and an additional pipe support were installed. At the second location, an existing concrete sluice way and concrete pipe supports were completely replaced.
D. 31 water service lines installed or replaced
E. 16 hydrants installed or replaced
F. 40 valves installed or replaced
G. 38 water main breaks addressed

FUTURE PROJECTS AND CAPITAL IMPROVEMENTS (PLANNED FOR 2020)

Water Project:

A. Sediment core sampling and testing in the silt pond and 6oft reservoir will be performed to determine appropriate disposal of dredge spoils. Advertise contract for dredging and for Contract 1 construction
B. Replace two more on-line turbidimeters
C. Review and comment on new permit for waste handling facility on Giles St
D. Upgrade electronic communication from the water treatment plant to the tanks and pump station

Distribution System:

A. Replace 500 feet of 4-in.water main with 8-in. water main
B. Replace 540 feet of 6-in. main with 8-in. main on Catherine/Eddy St and eliminate dead end
C. Improve circulation on South Aurora St by looping the dead-end water main with the one on Hudson Pl

Did you know?

- In addition to the water being continuously monitored at the City's water treatment plant, it is also checked in the system at 30 different locations per month. Locations include schools, laundromats, City buildings, etc.
- When you see a fire hydrant expelling large amounts of water (also known as flushing), either the fire department is testing that hydrant or the water department it is clearing the lines to provide fresher water to that distribution zone.
- The City's water treatment plant was newly rebuilt in 2017 with the newest technologies.

G. DETECTED CONTAMINANTS

Table 3: Detected Contaminants
2019 data

Contaminant	Units	Violation (Yes/No)	Date of Sample	Maximum Level Detected	Range (Minimum - Maximum)	Regulatory Limit	Likely Source of Contamination
Microbiological Contaminants							
Turbidity (CWE)	NTU	No	Jun-19	0.12	TT=<1NTU	N/A	Soil Runoff
Turbidity Samples (CWI)	%	No	Daily	100.00%	N/A	TT = 95% of samples are <0.3 NTU	Soil Runoff
Total Organic Carbon	mg/l	No	5/14/2019	2.1	0-2.1	TT	Naturally present in the environment
Disinfection By-products							
THM's (RAA at 4 diff. sites)						MCL=80	By-product of drinking water chlorination
THM 1 high level site	ug/l	No	2019	53	46-53		
THM 2 high level site	ug/l	No	2019	35	32-35		
HAA5 high level site	ug/l	No	2019	46	34-46		
Ave Res. Time-stage 1 site	ug/l	No	2019	27	21-27		
HAA5's (RAA at 4 diff. sites)						MCL=60	By-product of drinking water chlorination
THM 1 high level site	ug/l	No	2019	23	20-23		
THM 2 high level site	ug/l	No	2019	23	19-23		
HAA5 high level site	ug/l	No	2019	38	27-38		
Ave Res. Time-stage 1 site	ug/l	No	2019	20	16-20		
Chlorine Residual	mg/l	No	2019	3.1	N/A	MRDL=4	Water additive used to control microbes.
Inorganics							
Barium	ug/l	No	2019	39	32-39	MCL=2000 MCGL= 2000	Drilling wastes; discharge from metal refineries; erosion of natural deposits
Chloride	mg/l	No	2019	79	54-79	MCL=250	Naturally occurring or road salt
Chlorine Dioxide Residual(EP)	mg/l	No	2019	0.5	0.15-0.5	MRDL= 0.8 MRDLG= 0.08	Water additive used to control microbes.
Chlorite (EP, WTP lab data)	mg/l	No	2019	0.985	0.32-0.985	MCL=1.0 MCLG= 0.8	See Section C, page 4 for complete information on the violation.
Chlorite (Distribution system average)	mg/l	Yes	2019	0.28	0.16-0.28		
Chromium	ug/l	No	2019	6.4	1.1-6.4	MCL = 100	Eroding rocks and soils but mostly indicative of the extent of industrial history of an area
Copper (Distribution System, MAX is 90th percentile as defined by the lead and copper rule)	mg/l	No	2019	0.35	0.029-.65	AL = 1.3 MCLG= 1.3	Corrosion of household plumbing; erosion of natural deposits; leaching from wood preservatives
Lead (Distribution System, MAX is 90th percentile; see pg 8)	ug/l	No	2019	4.4	0-750	AL = 15 MCLG= 0	Household plumbing corrosion; erosion of natural deposits
Nickel	ug/l	No	2019	1.4	1.0-1.4	N/A	Naturally occurring and industrial activity
Nitrate (as N)	mg/l	No	2019	0.51	0-0.51	MCL=10 MCLG= 10	Fertilizer runoff; septic tank leaching; erosion of natural deposits
Manganese (EP,WTP lab data)	mg/l	No	2019	0.14	0.00-0.14	MCL=0.3	Naturally occurring; Indicative of landfill contamination
Sodium	mg/l	No	2019	33	21-33	Refer to Section C	Naturally occurring; road salt; animal waste; water softeners; water treatment chemicals
Sulfate	mg/l	No	2019	9.6	8.6-9.6	MCL=250	Naturally occurring

G. DETECTED CONTAMINANTS CONTINUED **Notes and Definitions for Table 3 (pg. 7)**

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

Disinfection Byproducts (DBPs): A group of chemicals that are formed when chlorine, or other disinfectants used to control microbial contaminants in drinking water, reacts with naturally occurring organic and inorganic matter in water.

EP: entry point

LEAD AND COPPER ACTION LEVEL: The maximum level (4.4 ppb) on Table 3 represents the 90th percentile- not the maximum level detected- during the 2019 sampling period, where 31 samples were collected between June and September.

HAA5 (haloacetic acids): A specific group of DBPs. The regulated haloacetic acids, known as HAA5's, are monochloroacetic, dichloroacetic, trichloroacetic, monobromoacetic and dibromoacetic acids. The maximum level detected of HAA5's is the highest of the four quarterly running annual averages calculated during the year and is the basis of the MCL for these compounds.

MAXIMUM LEVEL DETECTED: The highest measurement detected for the contaminant during the year. For total THM's and HAA5's the maximum level detected is the highest of the four quarterly running annual averages during the year.

MCL (maximum contaminant level): The highest level of contaminant that is allowed in drinking water. MCL's are set as close to the MCLG as feasible.

MCLG (maximum contaminant level goal): The level of contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow for a margin of safety.

mg/l (milligrams per liter): Corresponds to one part in one million parts of liquid (parts per million, ppm)

MRDL (maximum residual disinfection level): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary to control 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 contamination

N/A: not applicable

NTU (nephelometric turbidity units): A measure of the clarity of the water. Turbidity of approximately 5 NTU is barely noticeable by the average person.

pCi/l (picocuries per liter): A measure of radioactivity in water.

RAA: running annual average

Range: The range of lowest to highest measurements detected for contaminants measured during the year.

THM (trihalomethanes): A specific group of DPB. The regulated trihalomethanes are bromodichloromethane, bromoform, chloroform, and dibromochloromethane. The maximum level detected of THM's is the highest of the four quarterly running annual averages calculated during the year and is the basis of the MCL for these compounds.

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

ug/l (micrograms per liter): Corresponds to one part in one billion parts of a liquid (parts per billion, ppb).

UCMR: Unregulated Contaminant Monitoring Rule. The results for the CIWS sampling can be found in Table 5 on page 10

WTP: Water Treatment Plant

H. NON-DETECTED CONTAMINANTS

Table 4: Non Detected Contaminants-2019

Contaminant	CIWS	Contaminant	CIWS	Contaminant	CIWS
Synthetic Organics & Pesticides		**Inorganics**		**Principal Organics**	X
Group 1, From 1/29/19 Data		Aluminum (EP)	X	Benzene	X
Alachlor	X	Asbestos	NR	Bromobenzene	X
Aldicarb	X	Antimony	X	Bromochloromethane	X
Aldicarb sulfoxide	X	Arsenic	X	Bromomethane	X
Aldicarb sulfone	X	Beryillium	X		
Atrazine	X	Cadmium	X	N-Butylbenzene	X
Carbofuran	X	Chlorite	D	sec-Butylbenzene	X
Chlordane	X	Chromium	D	tert-Butylbenzene	X
Dibromochloropropane	X	Cyanide	X	Carbon Tetrachloride	X
2,4-D	X	Color	X	Chlorobenzene	X
Endrin	X	Odor	NT		
Ethylene dibromide	X	Iron	X	Chloroethane	X
Heptachlor	X	Manganese	D	Chloromethane	X
Heptachlor epoxide	X	Mercury	X	2-Chlorotoluene	X
Lindane	X	Nickel	D		
Methoxychlor	X	Selenium	X	4-Chlorotoluene	X
PCB - Aroclor 1016	X	Silver	X	Dibromomethane	X
PCB - Aroclor 1221	X	Thallium	X	1,2-Dichlorobenzene	X
PCB - Aroclor 1232	X	Nitrate	D	1,3-Dichlorobenzene	X
PCB - Aroclor 1242	X	Nitrite	X	1,4-Dichlorobenzene	X
PCB - Aroclor 1248	X	Zinc	X	Dichlorodifluoromethane	X
PCB - Aroclor 1254	X			1,1-Dichloroethane	X
PCB - Aroclor 1260	X	**Microbiological**		1,2-Dichloroethane	X
Pentachlorophenol	X	Total Coliforms	X	1,1-Dichloroethene	X
Toxaphene	X	E. Coli	X	cis-1,2-Dichloroethene	X
2,4,5-TP (Silvex)	X			trans-1,2-Dichloroethene	X
Group 2, From 1/29/19 Data		**OTHER (Contaminants)**		1,2-Dichloropropane	X
Aldrin	X	MBTE	X	1,3-Dichloropropane	X
Benzo(a)pyrene	X			2,2-Dichloropropane	X
Butachlor	X	**Radiological**	5-19-17	1,1-Dichloropropene	X
Carbaryl	X	Gross Alpha	X	cis-1,3-Dichloropropene	X
Dalapon	X	Gross Beta	X	trans-1,3-Dichloropropene	X
Di(2-ethylhexyl)adipate	X	Radium - 226	X	Ethylbenzene	X
Di(2-ethylhexyl)phthalate	X	Radium - 228	X	Hexachlorobutadiene	X
Dicamba	X	(Radiological sampling will happen again in 2026)		Isopropylbenzene	X
Dieldrin	X			p-Isopropyltoluene	X
Dinoseb	X			Methylene Chloride	X
Diquat	NR			n-Propylbenzene	X
Endothall	NR			Styrene	X
Glyphosate	NR			1,1,1,2-Tetrachloroethane	X
Hexachlorobenzene	X			1,1,2,2-Tetrachloroethane	X
Hexachlorooxyclopentadiene	X			Tetrachloroethene	X
3-Hydroxycrbofuran	X			Toluene	X
Methomyl	X			1,2,3-Trichlorobenzene	X
Metolachlor	X			1,2,4-Trichlorobenzene	X
Metribuzin	X			1,1,1-Trichloroethane	X
Oxamyl vydate	X			1,1,2-Trichloroethane	X
Picloram	X			Trichloroethene	X
Propachlor	X			Trichlorofluoromethane	X
Simazine	X			1,2,3-Trichloropropane	X
2,3,7,8-TCDD (Dioxin)	NR			1,2,4-Trimethylbenzene	X
Ethylene Glycol	NR			1,3,5-Trimethylbenzene	X
Propylene Glycol	NR			m-Xylene	X
				o-Xylene	X
				p-Xylene	X
				Vinyl Chloride	X

X = Monitored but not detected

D = Refer to detected list

NT = Not tested

NR = Not required and not monitored in the past five years

I. UCMR

In 2019, the City completed the required sampling for the EPA Unregulated Contaminant Monitoring Rule #4 (UCMR4).

See the following two tables for the list of Non-Detected and Detected unregulated contaminants.

For more information regarding this monitoring you may call Roxy Johnston at 607-273-4680.

Table 5- Non-Detect UCMR Results for 2018-2019

Contaminant	# of samples	Type
total microcystin	8	Cyanotoxin Chemical
anatoxin-a	8	
cylindrospermopsin	8	
Alpha-hexachlorocyclohexane	4	Pesticide or Pesticide Manufacturing Byproduct
chlorpyrifos	4	
dimethipin	4	
ethoprop	4	
oxyfluorfen	4	
profenofos	4	
tebuconazole	4	
total permethrin (cis- & trans-)	4	
tribufos	4	
1-butanol	4	Alcohol
2-methoxyethanol	4	
2-propen-1-ol	4	
butylated hydroxyanisole	4	Other Semivolatile Chemical
o-toluidine	4	
quinoline	4	
germanium	4	Metal
monobromoacetic Acid	16	Disinfection Byproduct

Table 6- Detected UCMR Contaminants

Contaminant	Units	Date of Sample	Sample Location	Detected Average	Detected Range	Likely Source of Contamination
Total Organic Carbon (TOC)	ug/l	2018-2019	Raw Water	2350	1400-2900	Naturally present in the environment
Bromide	ug/l	09/11/19	Raw Water	23	N/A- Detected once	Present in natural shale geologic formations typical in this area
Manganese	ug/l	2018-2019	Point of Entry	0.98	.57-2.0	Naturally occurring; Indicative of landfill contamination

Brominated Haloacetic Acid (HAA) Groups in Distribution System Sampled between 2018-2019

Contaminant	Units	Sample Location				Likely Source of Contamination
		Cliff Park Tank	Cass Park	Cornell St Tank	1012 N Aurora St	
		Detected Average/Range				
Bromochloroacetic Acid	ug/L	2.5	3.1	3.35	2.825	Disinfection Byproduct
		1.1-3.6	2.2-4.4	2.3-5.3	2-4.5	
Bromodichloroacetic Acid	ug/L	4.9	4.325	4.4	3.65	
		3.6-7.1	1.9-7	2.3-7.9	1.6-6.6	
Chlorodibromoacetic Acid	ug/L	0.96	0.855	0.9475	0.8275	
		0.45-1.4	0.39-1.3	0.34-1.5	0.39-1.3	
Tribromoacetic Acid	ug/L	2.1	2.1	2.2	2.2	
		2.1	2.1	2.2	2.2	
Dibromoacetic Acid	ug/L	0.81	0.73	0.72	0.935	
		0.81	0.73	0.62-0.82	0.77-1.1	
Dichloroacetic Acid	ug/L	6.95	8.675	8.925	5.725	
		4.9-12	4.8-13	4-16	1.5-10	
Monochloroacetic Acid	ug/L	ND	2.8	ND	ND	
		ND	2.8	ND	ND	
Trichloroacetic Acid	ug/L	14.825	10.15	10.875	7.65	
		4.3-21	4-17	4.2-20	1.1-14	

J. SECURITY CONCERNS

Generally, security threats to the water system have consisted of minor vandalism and property damage (i.e. lightning protection leads stolen at the intake building; graffiti). However, our security efforts focus to a high degree on the much less likely, but more serious, threat of intentional contamination of the water supply. The City has performed security assessments of their system and updated emergency response plans to cover the possibility of terrorism. Weaknesses in procedures have been corrected and improvements to increase security of the infrastructure have been undertaken.
Local police are aware of the security needs. Your awareness and reporting of suspicious activity throughout the system is appreciated.

K. SOURCE WATER PROTECTION

The New York State Health Department prepared a Source Water Assessment Report (SWAP) for every surface drinking water source. The report for Six Mile Creek was completed in 2004 and can be found on our website (ithacawater.org). We anticipate updating the SWAP in 2021 in cooperation with the NYS DOH. The main vulnerabilities found in 2004 were an elevated risk of microbial and protozoan contamination due to the amount of pasture land in the watershed and excessive sediment and turbidity entering and filling the drinking water impoundment.

The majority of sediment originates from two legacy sources: glacial deposits and upland erosion during settlement of the Ithaca area. Six Mile Creek served as an outlet tongue of the Laurentian ice sheet and has more deposits of glacial silts and clays than most other nearby streams. Deforestation during the 1800's and early 1900's led to increased upland erosion. Much of that sediment was deposited and remains in the riparian areas of local streams. Higher sediment loads will be typical in Six Mile Creek for hundreds of years to come as the stream carves out excess material and moves back toward an equilibrium state following reforestation of the watershed. A siltation pond upstream of the reservoir is designed to capture larger material and must be dredged more frequently to slow siltation within the reservoir. It was built in 1926 and has been dredged roughly every decade. The reservoir, built in 1912, has never been dredged. Dredging of the reservoir and upstream siltation pond have been moved to 2021.

Microbial and protozoan contamination are not an issue. Six Mile Creek has been sampled since 2004 by volunteer stream monitors coordinated by the Community Science Institute (CSI) which operates a certified water quality testing lab (NYSDOH-ELAP #1170). Six Mile Creek's water quality always rates among the highest of the monitored streams with respect to levels of phosphorus and nitrogen nutrients and E. coli bacteria. Water quality data for all monitored Cayuga Lake tributary streams may be accessed at http://database.communityscience.org/monitoringregions/1.

The invasive aquatic plant Water Chestnut *(Trapa natans)* was found in our reservoir during NYS Department of Environmental Conservation monitoring. The infestation is small but a seed bank exists. The City of Ithaca staff has partnered with local volunteers and a paid coordinator to begin a multi-year effort to remove the plant. Three removal events occurred in 2019. There was a 58% decline in wet weight material from 2018. This steep drop can be attributed to early detection, robust monitoring and early intervention. This will be an annual project for up to a decade.

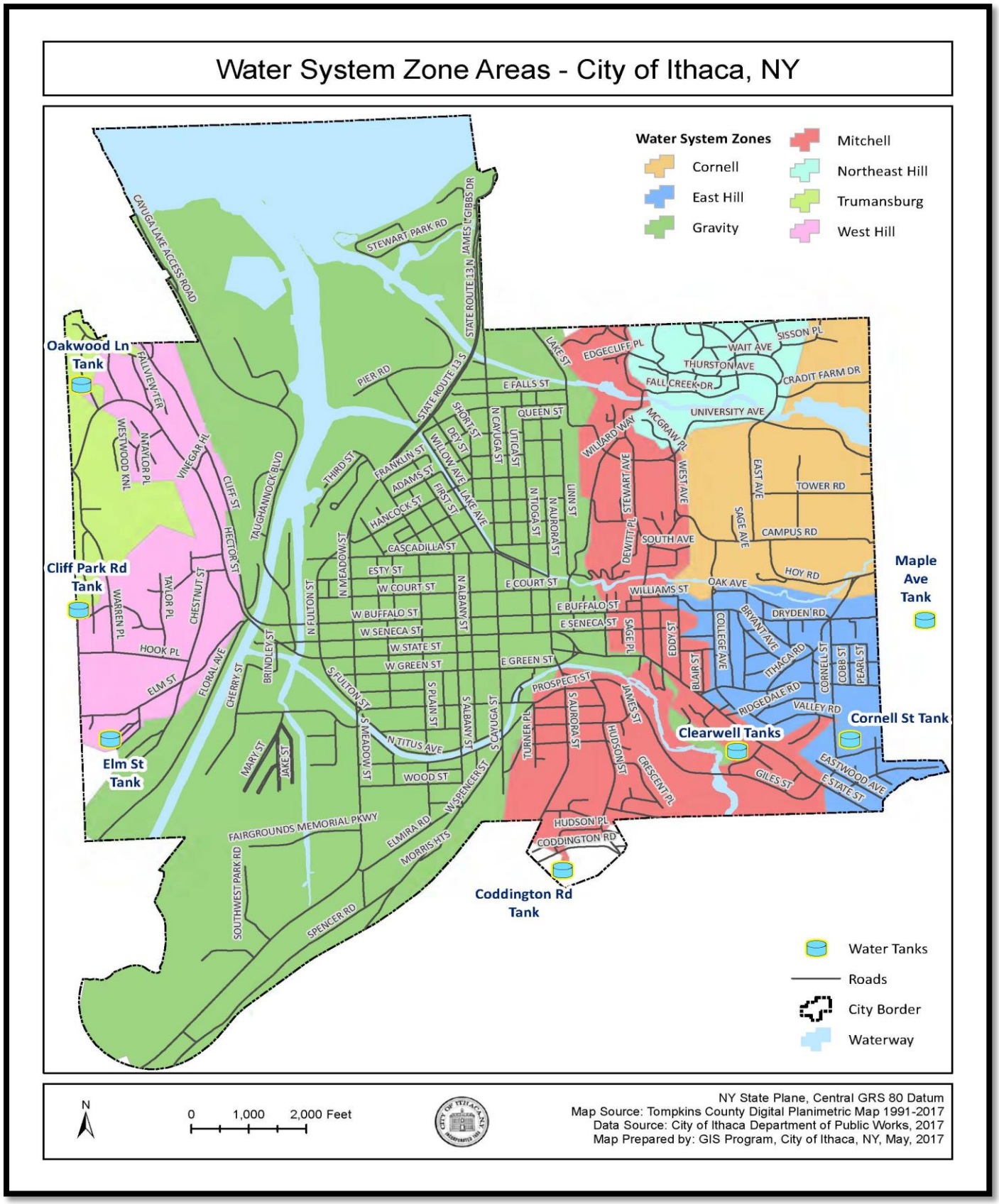
Harmful algae blooms (HABs) have been in the news for a few years now and have been increasing word wide. To date, no issues have been detected at our reservoir. Last year, Ithaca College began working with staff to refine the City's draft cyanotoxin response plan. Monitoring equipment was deployed in the reservoir and will be used into the future to better track changes in water quality and chlorophyll levels. The US EPA UCMR program (see page 10) in 2018-2019 included monitoring for HAB toxins and none were detected.

Preliminary research on tributary inputs started in 2019 with Ithaca College. An enhanced manganese tracking project was also started that year with Cornell University. The projects originated as separate efforts but have since joined together to enhance the applicability of the final results. The goal of these projects is to improve treatment efficiencies at the water plant and improve the stability of water quality.

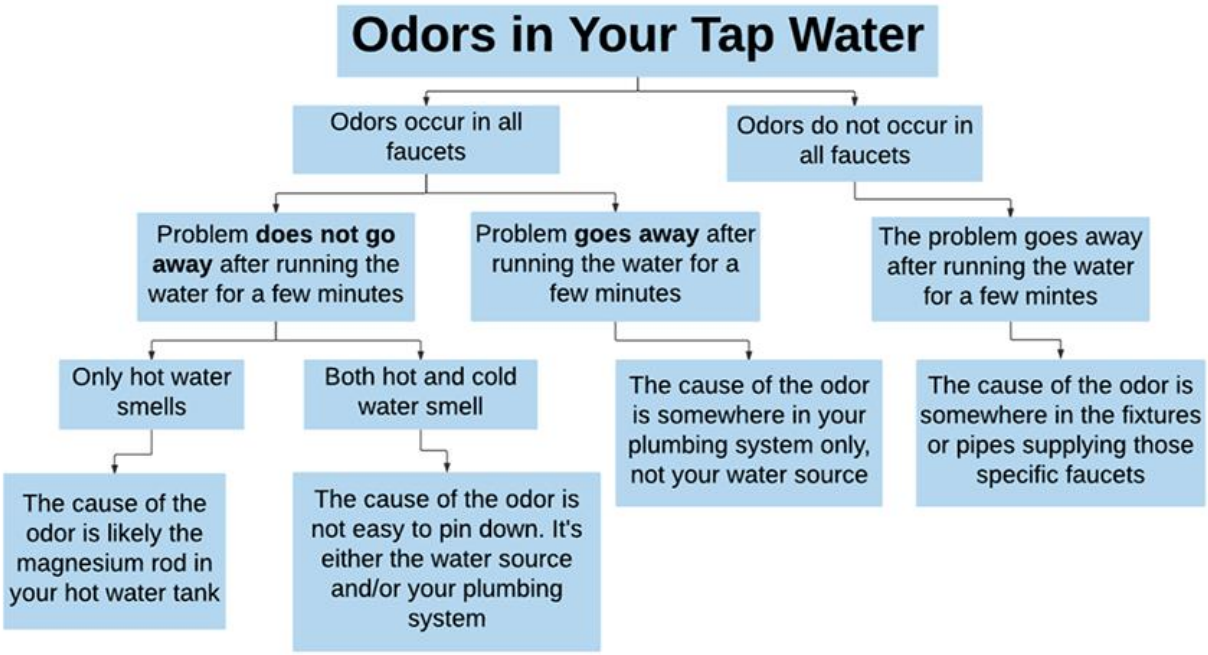
We ask that all our customers help us protect our water source. Ways to help include:

- **Adhering to the "no trespassing" signs at the reservoir**
- **Properly using and disposing of harmful materials (motor oil, paint, medicines, etc.) using Tompkins County resources such as household hazardous waste program or medication drop boxes**
- **Reporting suspicious activity**
- **Reduce, reuse and recycle as much as possible. Pick up litter in our natural areas.**
- **Participating in stream cleanup activities such as those coordinated by the Cayuga Lake Watershed Network, www.cayugalake.org**

L. MAP OF DIFFERENT ZONES OF WATER SYSTEM



LOCATING THE SOURCE OF THE ODOR



Why does my water taste or smell of chlorine? (also medicinal or metallic odors)

Chlorine is added during water treatment as a disinfectant to kill harmful bacteria. This is to ensure the quality of the drinking water is maintained through the pipe network to the point when it reaches your tap.

The concentrations of chlorine used to clean water are entirely harmless and continually monitored. Water leaving our treatment plant will contain less than four parts per million of chlorine and this will reduce even further before reaching your home.

Some people are more sensitive than others to the smell or taste of chlorine and may become aware of occasional changes in chlorine levels in their tap water. For example, the taste of chlorine may be more noticeable at times of day when water use is high. This is because the water is reaching you quicker and contains more chlorine than when it has been standing in the pipes. Levels of chlorine may also become more noticeable if we've been working on the water mains.

If you find the taste of chlorine unacceptable, a good solution is to fill a jug of tap water and keep it in the fridge. Not only will the chilled water taste better, it will lose that chlorine smell. You can also remove chlorine from the water by using an activated carbon filter. Be sure to follow the manufacturer's instructions regarding replacement of the filter as they can become sources of bacterial contamination if left in place too long.

MUSTY AND EARTHY ODORS

Seasonal variations in environmental conditions can lead to fluctuations in algal activity that create taste and odor compounds. These variations most commonly occur in the early spring and fall.

Is the water safe to drink?
Yes. The taste and odor is purely an aesthetic issue.

What causes the taste and odor?
Seasonal variations cause algae in our source water (Six Mile Creek) to release unpleasant taste and odor compounds. These compounds are naturally occurring and not harmful to people. They are released to the water in extremely tiny quantities (nanograms/Liter or parts per trillion), but for those with sensitive noses and palates their arrival is quite obvious. The reason for the release can be due to several factors, including:

- Significant increases in algae levels, commonly known as an algal bloom
- Change in algae types from those that do not produce taste and odor compounds to those that do
- A die-off of certain types of algae due to seasonal variations in water temperature or sunlight availability or other environmental conditions
- Seasonal turnover of the reservoir water column in the fall when the surface water cools and settles and remixes with water containing low oxygen from the deep region.

What steps does the City of Ithaca take to control the taste and odor?
We utilize treatment techniques such as sodium permanganate and chlorine dioxide to minimize the unpleasant taste and odors. However at times, levels of taste and odor compounds can be high enough that our water treatment processes cannot remove 100% of the compounds from our finished drinking water.

How long will the taste and odor last?
The length of historical taste and odor episodes has typically been no more than a few weeks in duration. While treatment for taste and odor in our source water is a routine part of the normal water treatment process, the peak periods where customers may notice this condition is generally only for a few days or up to a couple weeks. The time it takes for the taste and odor of the water to improve varies from household to household and is impacted by the fact that our drinking water has to work its way through the water distribution system, which contains over 100 miles of water lines, before it is delivered to your home. While the taste and odor may be completely removed and water restored to normal at the water treatment plant, it may take several days for these improvements to reach customers across town.

What steps can be taken at home by customers to minimize the taste and odor? Some customers have reported improved taste and odor by adding a lemon wedge to a refrigerated open pitcher of drinking water. Additionally, standard home water filtration systems that contain fresh carbon may help to mitigate the tastes and odors of these substances.