BROCKVILLE DRINKING WATER SYSTEM

BROCKVILLE
CITY OF THE 1000 ISLANDS

2019 ANNUAL WATER QUALITY REPORT

P. Raabe, P. Eng., Director of Environmental Services
C. Drake, Supervisor Water Systems

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EXECUTIVE SUMMARY

The City of Brockville's Water Systems Division is pleased to provide the 2019 Annual Drinking Water Quality Report. The purpose of this report is to keep the public and Council informed regarding the quality of the City's drinking water and the performance and maintenance of our water treatment and distribution systems.

The City of Brockville is dedicated to delivering a safe, reliable, drinking water supply while remaining compliant with all regulatory requirements. Achievement of those commitments is supported by risk-based process evaluation, staff competency, effective communication, and appropriate contingency/incident response measures. The managers and employees of the City of Brockville who are directly involved in the production and delivery of safe drinking water are committed to and share in the responsibilities for implementing, maintaining, and contributing to the continual improvement of the drinking water quality. The water delivered to the consumers in the City of Brockville and a portion in the Township of Elizabethtown-Kitley continues to be safe, meeting all drinking water quality regulatory standards.

This Annual Drinking Water Quality Report is prepared in accordance with the Municipal Drinking Water Licence, Drinking Water Works Permit for the Brockville Drinking Water System and Ontario Regulation 170/03, Section 11 and Schedule 22. Included with this report are analytical data, plant flow, adverse water quality incidents and corrective action resolutions, as well as a process flow schematic of the facility.

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LIST OF ACRONYMS & DEFINITIONS

AWQI	Adverse Water Quality Incidents Examples of adverse water results: ▪ An analytical result that exceeds a health-based water quality standards ▪ Any evidence that disinfection may not have been effective ▪ Low chlorine residuals
C of A	Certificate of Approval
CFU	colony forming units
CGSB	Canadian General Standards Board
DWQMS	Drinking Water Quality Management Standard
GUDI	groundwater under the direct influence of surface water
L/s	litres per second
m^3/d	cubic metres per day
mg/L	milligrams per litre
mL	milliliter
ML/d	Mega (million) litres per day
MECP	Ministry of the Environment, Conservation and Parks (Ontario)
MOH	Medical Officer of Health
PVC	Poly Vinyl Chloride
O. Reg.	Ontario Regulation
PTTW	Permit to Take Water
R.R.O.	Revised Regulations Ontario (1990)
SCADA	Supervisory Control and Data Acquisition
SDWA	Safe Drinking Water Act, 2002
WTP	Water Treatment Plant

1. INTRODUCTION

This Annual Water Quality Report is for the period from January 1st to December 31st, 2019 and includes reporting for both the municipal drinking water treatment and distribution systems that the City of Brockville owns and operates and the water distribution system that the Township of Elizabethtown-Kitley owns and the City of Brockville operates.

This report contains three different reports required for the City of Brockville and the Elizabethtown-Kitley Drinking Water Systems:

- Section 11 Annual Report, as per Section 11 of O. Reg. 170/03
- Summary report as per Schedule 22 of O. Reg. 170/03
- Summary of the raw water values that were submitted to the Ministry of the Environment, Conservation and Parks under O. Reg. 387/04 Water Taking & Transfer

This annual report is available to the public at no charge. Users of this drinking water system have been notified that this annual report is available by placing a notice on the City of Brockville's website and water billing inserts. The 2019 Annual Water Quality Report is available to the public at no charge at the following locations:

- City of Brockville's website - www.brockville.com
- City of Brockville – Public Library
- City of Brockville – Customer Service office, City Hall
- City of Brockville – Water Systems Division, 20 Rivers Ave., 613-342-8772 ext. 5512
- Township of Elizabethtown-Kitley's website - http://www.elizabethtown-kitley.on.ca
- Township of Elizabethtown-Kitley's Municipal Office – 6544 New Dublin Road, RR#2 Addison

2. LEGISLATED REQUIREMENTS

2.1 Drinking-Water Systems Regulation (O. Reg. 170/03)

Under Schedule 22 of the Drinking Water Systems Regulation (O. Reg. 170/03), Summary Reports for Municipalities, annual reports to the owners of large municipal residential systems and small municipal systems are required. The summary report must be submitted no later than March 31st to members of municipal council. The contents must list the requirements of the *Safe Drinking Water Act, 2002*, the regulations, the system's approval and any order that the system failed to meet at any time during the reporting period covered, specify the duration of the failure, and the measures taken to correct the failure.

In addition, the report must include a summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly averages, maximum daily flows and daily instantaneous peak flows. The summary must be compared to the rated capacity and flows provided in the system's Municipal Drinking Water Licence.

The City of Brockville is the Owner of the Water Treatment Plant, trunk and local water distribution systems, and the City of Brockville is the Operating Authority for the Township of Elizabethtown-Kitley's water distribution system.

2.2 Summary of Regulatory Requirements

Acts and Regulations

Regulated systems must meet the requirements of Ontario's *Safe Drinking Water Act, 2002* and its regulations. Most notably, the Drinking Water Systems Regulation sets out treatment and testing requirements for all categories of regulated water systems, including small non-municipal and seasonal operations.

Safe Drinking Water Act, 2002

In the Part Two Report of the Walkerton Inquiry, Justice O'Connor recommended that the Ontario government enact a *Safe Drinking Water Act, 2002* to deal with matters related to treatment and distribution of drinking water. As articulated by Justice O'Connor, the purpose of the *Safe Drinking Water Act, 2002* is to gather in one place all legislation and regulations relating to the treatment and distribution of drinking water.

Summary of Provincial Legislation Significant to Water Operations

ACT	O. Reg.
WATER OPPORTUNITIES and WATER CONSERVATION ACT	
➢ Water Opportunities and Water Conservation Act, 2010	**Bill 72**
CLEAN WATER ACT, 2006	
➢ Source Protection Areas and Regions	O. Reg. 284/10
➢ Source Protection Committees	O. Reg. 288/10
➢ Terms of Reference	O. Reg. 287/07
SAFE DRINKING WATER ACT, 2002	
➢ Drinking Water Systems Regulation	O. Reg. 170/03
➢ Certification of Drinking-Water System Operators and Water Quality Analysts	O. Reg. 128/04
➢ Drinking Water Testing Services - relating to laboratory licensing	O. Reg. 248/03
➢ Schools, private schools and day nurseries	O. Reg. 243/07
➢ Compliance and Enforcement Regulation	O. Reg. 242/05
➢ Ontario Drinking Water Quality Standards	O. Reg. 169/03
➢ Definitions of Words and Expressions Used in the Act	O. Reg. 171/03
➢ Definition of Deficiency and Municipal Drinking Water System	O. Reg. 172/03
➢ Licensing of Municipal Drinking-Water Systems	O. Reg. 188/07
➢ Financial Plans	O. Reg. 453/07

ONTARIO WATER RESOURCES ACT	
➢ Licensing of Sewage Works Operators	O. Reg. 129/04
➢ Approval Exemption	O. Reg. 525/98
➢ Wells	R.R.O. 1990, Reg. 903
➢ Revoking Ontario Regulation 459/00	O. Reg. 175/03
➢ Revoking Ontario Regulation 505/01	O. Reg. 176/03
➢ Water Taking	O. Reg. 387/04
➢ Charges for Industrial and Commercial Water Users	O. Reg. 450/07
ENIVIRONMENTAL PROTECTION ACT	
➢ Certificate of Approval Exemptions - Air	O. Reg. 524/98
ENIVIRONMENTAL BILL OF RIGHTS ACT	
➢ Prescribing the Safe Drinking Water Act, 2002	O. Reg. 257/03

3. ANNUAL WATER QUALITY SUMMARY FOR 2019

The City of Brockville's Water Systems Division is responsible for the Brockville Drinking Water System under O. Reg. 170/03 including water treatment plant, trunk water distribution system (elevated storage, reservoirs, booster stations) and local water distribution systems. Staff's primary responsibility is water treatment and distribution in compliance with all applicable legislation and municipal drinking water licences and drinking water works permits. Routine water quality testing and continuous monitoring of water quality and quantity is conducted to ensure compliance. All data from SCADA, process control point data, in-house laboratory results and external laboratory results are all captured in a WaterTrax data management system.

3.1 Water Quality Data

Raw and treated water is sampled and tested for chemical, physical and microbiological parameters in accordance with the requirements of O. Reg. 170/03 and individual municipal licences and permits. Sampling is also conducted in the distribution system primarily for bacteriological indicators and evidence of sustained chlorine residuals. Enhanced sampling programs are also defined by the Water Systems Division, and testing procedures followed and where necessary submitted to external accredited laboratory for analysis. This level of water quality monitoring ensures public health and public confidence in the water supply.

The majority of analysis is conducted by an external accredited laboratory, with some specialized analysis contracted to other accredited laboratories. In accordance with Schedule 16 of O. Reg. 170/03, all required notifications of adverse water quality incidents are provided to the Spills Action Centre and Medical Officer of Health.

Operational Testing:

The following table is a summary of the operational testing completed in 2019 (as per O. Reg. 170/03, Schedules 6 and 7).

PARAMETER TESTED:	# of Grab Samples	RESULTS		
		Minimum	Maximum	Average
Turbidity – Raw (NTU)	Continuous monitoring	0.10	5.00	0.43
Turbidity – Filter 1 (NTU)	Continuous monitoring	0.03	0.33	0.06
Turbidity – Filter 2 (NTU)	Continuous monitoring	0.03	0.42	0.05
Turbidity – Treated (NTU)	Continuous monitoring	0.03	1.00	0.06
Chlorine – Pre Filter (mg/l)	Continuous monitoring	0.01	3.00	1.00
Chlorine – Reservoir (Main Plant) (mg/l)	Continuous monitoring	1.67	2.45	2.05
Chlorine – Plant Effluent (mg/l)	Continuous monitoring	0.94	2.39	2.02
Chlorine – Distribution System Parkedale Reservoir (mg/l)	Continuous monitoring	1.29	2.37	1.76
Chlorine – Elizabethtown-Kitley Distribution System (mg/l)	52	0.84	1.68	1.17
Fluoride – Plant Effluent (mg/l)	365	0.12	0.82	0.53
UV Dosage (mJ/cm^2)	Continuous monitoring	39	87	n/a
UV Intensity (mW/cm^2)	Continuous monitoring	27	105	n/a
UV Transmittance (%)	365	95	95	95

Additional Testing as Required by the Municipal Drinking Water Licence, Order or Other Legal Instrument for 2019:

TYPE OF LEGAL INSTRUMENT:	PARAMETER
Municipal Drinking Water Licence 152-101 Section 1.5	TSS Residue – Monthly
Residue Management – Composite Sample	no samples required - residue management - continuous discharge to sanitary sewer

Microbiological Testing:

Microbiological testing completed under the Schedule 10, 11 or 12 of O. Reg. 170/03 during 2019 reporting period.

Sample Description:	Number of Samples	Range of E.Coli Or Fecal Results CFU/100ml		Range of Total Coliform Results CFU/100ml		Number of HPC Samples	Range of HPC Results CFU/ml	
		Min.	Max.	Min.	Max.		Min.	Max.
Raw	52	0	16	0	>400	52	<10	>2000
Treated	56	0	1	0	17	52	<10	80
Distribution	519	0	0	0	0	317	<10	30

Chemical Testing:
The following Tables are a summary of the chemical testing completed in 2019 (as per O. Reg. 170/03, Schedule 13).

Schedule 23
Summary of Inorganic parameters tested during this reporting period or the most recent sample results:

Parameter	Sample Date	Result Value	Unit of Measure	Exceeded the Standard	Exceeded Half the Standard
Antimony	Jan. 2/19	<0.0001	mg/l	No	No
Arsenic	Jan. 2/19	0.0004	mg/l	No	No
Barium	Jan. 2/19	0.019	mg/l	No	No
Boron	Jan. 2/19	0.017	mg/l	No	No
Cadmium	Jan. 2/19	<0.000015	mg/l	No	No
Chromium	Jan. 2/19	<0.002	mg/l	No	No
Mercury	Jan. 2/19	<0.00002	mg/l	No	No
Selenium	Jan. 2/19	<0.001	mg/l	No	No
Sodium	Jan. – Dec. (13 samples)	15.7*	mg/l	No	n/a
Uranium	Jan. 2/19	0.00023	mg/l	No	No
Nitrite	Quarterly (4 samples)	<0.1*	mg/l	No	No
Nitrate	Quarterly (4 samples)	0.3*	mg/l	No	No

average
n/a – not applicable

Schedule 24
Summary of Organic parameters sampled during this reporting period or the most recent sample results:

Parameter	Sample Date	Result Value	Unit of Measure	Exceeded the Standard	Exceeded Half the Standard
Alachlor	Jan. 2/19	<0.3	ug/l	No	No
Atrazine + N-dealkylated metabolites	Jan. 2/19	<0.5	ug/l	No	No
Azinphos-methyl	Jan. 2/19	<2	ug/l	No	No
Benzene	Jan. 2/19	<0.5	ug/l	No	No
Benzo(a)pyrene	Jan. 2/19	<0.005	ug/l	No	No
Bromoxynil	Jan. 2/19	<0.3	ug/l	No	No
Carbaryl	Jan. 2/19	<3	ug/l	No	No
Carbofuran	Jan. 2/19	<1	ug/l	No	No
Carbon Tetrachloride	Jan. 2/19	<0.2	ug/l	No	No
Chlorpyrifos	Jan. 2/19	<0.5	ug/l	No	No
Diazinon	Jan. 2/19	<1	ug/l	No	No
Dicamba	Jan. 2/19	<5	ug/l	No	No
1,2-Dichlorobenzene	Jan. 2/19	<0.1	ug/l	No	No
1,4-Dichlorobenzene	Jan. 2/19	<0.2	ug/l	No	No
1,2-Dichloroethane	Jan. 2/19	<0.1	ug/l	No	No
1,1-Dichloroethene	Jan. 2/19	<0.1	ug/l	No	No
Dichloromethane	Jan. 2/19	<0.3	ug/l	No	No
2-4 Dichlorophenol	Jan. 2/19	<0.1	ug/l	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	Jan. 2/19	<5	ug/l	No	No
Diclofop-methyl	Jan. 2/19	<0.5	ug/l	No	No
Dimethoate	Jan. 2/19	<1	ug/l	No	No

Parameter	Sample Date	Result Value	Unit of Measure	Exceeded the Standard	Exceeded Half the Standard
Diquat	Jan. 2/19	<5	ug/l	No	No
Diuron	Jan. 2/19	<5	ug/l	No	No
Glyphosate	Jan. 2/19	<25	ug/l	No	No
Malathion	Jan. 2/19	<5	ug/l	No	No
2-Methyl-4-Chlorophenoxyacetic acid (MCPA)	Jan. 2/19	<10	mg/l	No	No
Metolachlor	Jan. 2/19	<3	ug/l	No	No
Metribuzin	Jan. 2/19	<3	ug/l	No	No
Monochlorobenzene	Jan. 2/19	<0.2	ug/l	No	No
Paraquat	Jan. 2/19	<1	ug/l	No	No
Pentachlorophenol	Jan. 2/19	<0.1	ug/l	No	No
Phorate	Jan. 2/19	<0.3	ug/l	No	No
Picloram	Jan. 2/19	<5	ug/l	No	No
Polychlorinated Biphenyls(PCB)	Jan. 2/19	<0.05	ug/l	No	No
Prometryne	Jan. 2/19	<0.1	ug/l	No	No
Simazine	Jan. 2/19	<0.5	ug/l	No	No
THM (NOTE: shows latest annual average)	Quarterly *(min)* (4 samples)	27.8*	ug/l	No	No
HAA's (NOTE: shows latest annual average)	Quarterly *(min)* (4 samples)	19.7*	ug/l	No	No
Terbufos	Jan. 2/19	<0.3	ug/l	No	No
Tetrachloroethylene	Jan. 2/19	<0.2	ug/l	No	No
2,3,4,6-Tetrachlorophenol	Jan. 2/19	<0.1	ug/l	No	No
Triallate	Jan. 2/19	<10	ug/l	No	No
Trichloroethylene	Jan. 2/19	<0.1	ug/l	No	No
2,4,6-Trichlorophenol	Jan. 2/19	<0.1	ug/l	No	No
Trifluralin	Jan. 2/19	<0.5	ug/l	No	No
Vinyl Chloride	Jan. 2/19	<0.2	ug/l	No	No

average

LEAD SAMPLING:

Brockville Drinking Water System (Lead Sampling Exemption for plumbing only)

Sampling Period – Winter (December 15th to April 15th)	Plumbing	Distribution
Number of individual samples	(Lead Sampling Regulatory Relief)	4
Number of sample points (locations)	N/A	4
Number of individual sample exceedances	N/A	0
Number of sample points with an exceedance during the period	N/A	0
Percentage of sample points with an exceedance	N/A	0
Is the system required to have a Corrosion Control Plan prepared?	NO	NO
Do the reduced sampling & frequency requirements apply to the system?	NO	N/A
Do the plumbing sample exemptions apply to the system?	YES	YES

Sampling Period - Summer (June 15th to October 15th)	Plumbing	Distribution
Number of individual samples	(Lead Sampling Regulatory Relief)	4
Number of sample points (locations)	N/A	4
Number of individual sample exceedances	N/A	0
Number of sample points with an exceedance during the period	N/A	0
Percentage of sample points with an exceedance	N/A	0
Is the system required to have a Corrosion Control Plan prepared?	NO	NO
Do the reduced sampling & frequency requirements apply to the system?	NO	N/A
Do the plumbing sample exemptions apply to the system?	YES	N/A

Elizabethtown-Kitley Distribution System (Lead Sampling Exemption for plumbing only)

Sampling Period – Winter (December 15th to April 15th)	Plumbing	Distribution
Number of individual samples	(Lead Sampling Regulatory Relief)	0
Number of sample points (locations)	N/A	0
Number of individual sample exceedances	N/A	0
Number of sample points with an exceedance during the period	N/A	0
Percentage of sample points with an exceedance	N/A	0
Is the system required to have a Corrosion Control Plan prepared?	NO	NO
Do the reduced sampling & frequency requirements apply to the system?	NO	YES
Do the plumbing sample exemptions apply to the system?	YES	N/A

Sampling Period - Summer (June 15th to October 15th) – sampled November 7, 2019	Plumbing	Distribution
Number of individual samples	(Lead Sampling Regulatory Relief)	2
Number of sample points (locations)	N/A	2
Number of individual sample exceedances	N/A	0
Number of sample points with an exceedance during the period	N/A	0
Percentage of sample points with an exceedance	N/A	0
Is the system required to have a Corrosion Control Plan prepared?	NO	NO
Do the reduced sampling & frequency requirements apply to the system?	NO	YES
Do the plumbing sample exemptions apply to the system?	YES	N/A

4. BROCKVILLE DRINKING WATER SYSTEM

4.1 Water System Description

Drinking-Water System Number:	220001263
Drinking-Water System Name:	Brockville Drinking Water System
Drinking-Water System Owner:	City of Brockville
Accredited Operating Authority:	City of Brockville
Municipal Drinking Water Licence:	152-101
Drinking Water Works Permit:	152-201
Permit To Take Water:	8577-5ZCP45
Drinking-Water System Category:	Large Municipal
Design Capacity:	36.4 ML/D
Treatment:	Direct Filtration Class III
Local Distribution:	Class II
Trunk Distribution:	Class III
Source Water:	St Lawrence River
Population Served:	22,000

Connected Drinking-Water Systems:

Drinking-Water System Number:	260007777
Drinking-Water System Name:	Elizabethtown-Kitley Distribution System
Drinking-Water System Owner:	Township of Elizabethtown-Kitley
Accredited Operating Authority:	City of Brockville
Municipal Drinking Water Licence:	257-101
Drinking Water Works Permit:	257-201
Drinking-Water System Category:	Large Municipal Class I
Water Source:	City of Brockville DWS
Population Served:	350

4.1.1 Water Treatment Plant

The City of Brockville's Water Treatment Plant is a Class III direct filtration facility located at 20 Rivers Avenue, located on the St. Lawrence River and serves the City of Brockville (population 22,000), and a portion of the Township of Elizabethtown-Kitley (population 350). The Water Distribution System is separated into a Trunk Water Distribution System and Local Water Distribution System. The Trunk WDS is a Class III System (Certificate #3811) and the Local

System is a Class II System (Certificate #2193). A 900 mm raw water intake pipe equipped with zebra mussel control lies on the bottom of the St. Lawrence River extending 300 metres offshore at a depth of 10.5 metres. The treatment process has a design maximum flow rate of 36.4 ML/d and is composed of a number of sub-units:

- low lift pumping station
- coagulation and flocculation using polyaluminum chloride (PAC)
- pre- and post-filter disinfection with chlorine gas
- two granular activated carbon filters
- fluoride addition
- reservoir and high lift pumping station
- final treated water UV disinfection and additional chlorination

4.1.2 Treatment Chemicals Used

All chemicals used in the operation of the drinking water system meets all applicable standards set by both the American Water Works Association ("AWWA") and the American National Standards Institute ("ANSI") safety criteria standards NSF/60 and NSF/61

Chemical	Application	Supplier
Chlorine Gas	Pre, Post Filter, Plant Effluent (Primary Disinfection)	Brenntag Canada
Poly Aluminum Chloride XL-6 (SternPAC) PAX XL-1900 (ACH)	Pre Filter(Coagulant)	Kemira Water Solutions
Hydrofluorosilicic acid (HFSA)	Plant Effluent (Fluoride)	Brenntag Canada

4.1.3 Water Distribution System – Trunk and Local Systems

The City of Brockville's Distribution system comprises of a Class III Trunk Distribution and a Class II Local Distribution. The distribution system consists of a number of underground pipes ranging in size from 100 mm in diameter to 600 mm diameter and are made of a variety of materials including, cast iron, ductile iron, poly vinyl chloride, concrete, steel, HDPE and asbestos cement. In addition there are over 8,330 service connections, 890 fire hydrants and 2,800 valves. The distribution also consists of a number of treated water storage facilities and booster stations as indicated below.

- Parkedale Avenue Reservoir
  The Parkedale Avenue Reservoir, Booster Pumping Station and Re-chlorination Facility services two geographical areas which are Zone 1, which is the area South of Highway 401, and Zone 2 which is the area North of Highway 401. It is a 7,600 m^3 capacity reservoir at-grade, single cell, concrete, non-baffled, treated water reservoir.

- Perth Street Elevated Storage Tank (Water Tower)
  The City of Brockville has a 1,900 m^3 overhead storage tank located on Perth St. It is a single cell, steel, non-baffled treated water storage tank.

- Water Booster Stations
  There are three (3) booster pump stations (First Ave., Sunset Blvd., Parkedale Ave.) which are part of the distribution system. The purpose of booster stations is to ensure consistent pressure is maintained throughout the system.

- Feeder Main & Local WDS
  600 mm single feeder main from the WTP to the Church St./Perth St. area where flow splits between the Water Tower and the Local and Trunk distribution systems.

4.2 2019 Flow Summary

In 2019 the maximum or peak daily raw water flow was 23,577 L/min which occurred on May 28, 2019 and was below the permitted maximum amount of 25,278 L/min as indicated in the table below. In addition, the annual average daily raw water flow to the WTP was 11,057,240 L/day or 30.4% of its maximum approved treatment capacity of 36,400,000 L/day.

Maximum Permitted Water Taking (PTTW) – WTP

Condition:	Maximum Permitted Water Taking
Maximum Amount of Water Taken per Minute	25,278 (L/min)
Maximum Amount of Water Taken per Day	36,400 (m3/d)

The Permit to Take Water specifies the maximum flow into individual treatment systems as indicated below.

Maximum Flow to Treatment System – WTP

Treatment System/Stage:	Maximum Flow Rate (m3/d)
GAC Filters – Flow	19,600 each
UV Disinfection System	36,400 each

The summary of the volume of water taken daily and the flows of the water supplied during the 2019 calendar year is provided in **Appendix C** and includes 2019 flow data and historical flow of past years of pumping at the WTP.

The historical total plant effluent volume is also displayed in **Appendix C**. The total annual plant effluent volume for 2019 is 3.5% less than the total annual plant effluent volume from 2018. This information is provided for interest and to evaluate the treatment system trends over time in order to prepare for any future improvements required to meet this demand.

4.3 Adverse Test Results

In accordance with Schedule 16 of O. Reg. 170/03, all required notifications of adverse water quality incidents were provided to the Medical Officer of Health (MOH) and the Spills Action Centre (SAC). In 2019 there were a total of two (2) reports filed with SAC as summarized below.

AWQI Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
May 8, 2019 AWQI 145346	TC / EC	TC 16 EC 1	Notification to MOH & SAC Resample – raw and treated water, bacti bottles mislabeled resulting in AWQI Resampling conducted - all resample samples clean All reports submitted to MOH and SAC	May 13, 2019
May 13, 2019 AWQI 145387	Treated Water Discharge – Sodium	38mg/L	Notification to MOH & SAC Resample – raw and treated water Resampling conducted - all resample samples within MAC (13.6mg/L and14.0mg/L respectively) All reports submitted to MOH and SAC	May 15, 2019

4.4 Operator Certification

The *Certification of Drinking-Water System Operators and Water Quality Analysts* (O. Reg. 128/04) requires owners to ensure that every operator employed in the facility holds a Licence applicable to that type of facility. All operators in the Water Systems Division hold the required certifications for treatment and distribution.

4.5 Capital Program

The 2019 Capital Program can be found in **Appendix B** of this Report. All works are subject to the annual budget process and approval by Council. A 30 Year Capital Replacement Equipment Plan has been developed that includes an extensive breakdown of all capital equipment that requires allocated funds for refurbishment or replacement. This is not included in the Annual Summary Report but can be made available upon request.

5. TOWNSHIP OF ELIZABETHTOWN-KITLEY WATER DISTRIBUTION SYSTEM

5.1 Water System Description

The City of Brockville provides treated water from its Water Treatment Plant to the Elizabethtown-Kitley Water Distribution System (Class I) west of the City. This is facilitated through a 14 kilometer water main that extends along County Road #2 to the Country Club, through a meter chamber and associated appurtenances. This distribution system services approximately 350 residential customers. This system was installed in 1998 by the Ministry of Transportation and the Ontario Clean Water Agency and turned over to the Township of Elizabethtown-Kitley in 1999.

A booster station at Lily Bay provides for increased pressure only. The Township Fire Department is aware of this operational constraint and does not use the distribution system for firefighting or training purposes. An automated flushing station at the end of the service line is required to maintain free chlorine residual above the regulated minimum level of 0.20 mg/L. City Staff operate and maintain this system on behalf of the Township as the Operating Authority.

Township of Elizabethtown-Kitley

Drinking-Water System Number:	260007777
Drinking-Water System Name:	Elizabethtown-Kitley Distribution System
Drinking-Water System Owner:	Township of Elizabethtown-Kitley
Accredited Operating Authority:	City of Brockville
Municipal Drinking Water Licence:	257-101
Drinking Water Works Permit:	257-201
Drinking-Water System Category:	Large Municipal Class 1
Water Source:	City of Brockville DWS
Population Served:	350

5.2 Adverse Test Results

No adverse water quality incidents reported to SAC in 2019 for the Township of Elizabethtown-Kitley WDS.

5.3 Historical Flow Results

A summary of the volume of water taken daily and the flows of the water supplied during the 2019 calendar year is provided in **Appendix C**.

The historical flow is also displayed in **Appendix C**. The total flow for 2019 is 19% more than the total flow from 2018. This information is provided for interest and to evaluate the system flow trends over time in order to prepare for any future improvements required to meet this demand.

6. CONCLUSION

The City of Brockville serves approximately 22,000 residents and about 350 residents in the Township of Elizabethtown-Kitley. One of the City's most important responsibilities is to protect public health by providing its residents with clean, safe drinking water. Routine water quality testing and continuous monitoring of the water quality and quantity is completed by City Staff at the Water Treatment Plant and throughout the distribution systems to demonstrate that the City consistently meets or exceeds the standards set by the MECP.

In Ontario, water taking, treatment and distribution are governed by a number of Acts and Regulations. This report fulfills the reporting requirements of the Drinking Water System Regulation (O. Reg. 170/03) made under the Safe Drinking Water Act for all of the municipal drinking water treatment systems in the City of Brockville and the Township of Elizabethtown-Kitley, and covers the period from January 1st to December 31st 2019. As required under this same regulation, the report is prepared prior to March 31st and is filed for review and approved by both the City of Brockville's and Elizabethtown-Kitley's municipal council. Copies of the report are also on hand at the Public Library, the Customer Service Office at City Hall, the Water Treatment Plant at 20 Rivers Avenue, Brockville and the Township of Elizabethtown-Kitley's Municipal Office at 6544 New Dublin Road, RR#2 Addison.

The contents of this report highlights the requirements of the Safe Drinking Water Act, the regulations, and the systems' approval including any reportable events and the corresponding corrective actions undertaken in 2019. In addition, the report also includes a summary of the quantities and flow rates of the water supplied during the calendar year, including monthly averages, maximum daily flows, and daily instantaneous peak flow rates. The summaries are compared to the rated capacity and flow rates in the system approvals.

The Water Systems Division has taken all necessary steps to comply with all regulatory requirements in the production and distribution of safe drinking water and to conform to the requirements of implementing and maintaining a Drinking Water Quality Management System. The dedication and commitment of all Water Systems Staff ensures a safe reliable drinking water supply to consumers of the City of Brockville and a portion of the Township of Elizabethtown-Kitley.

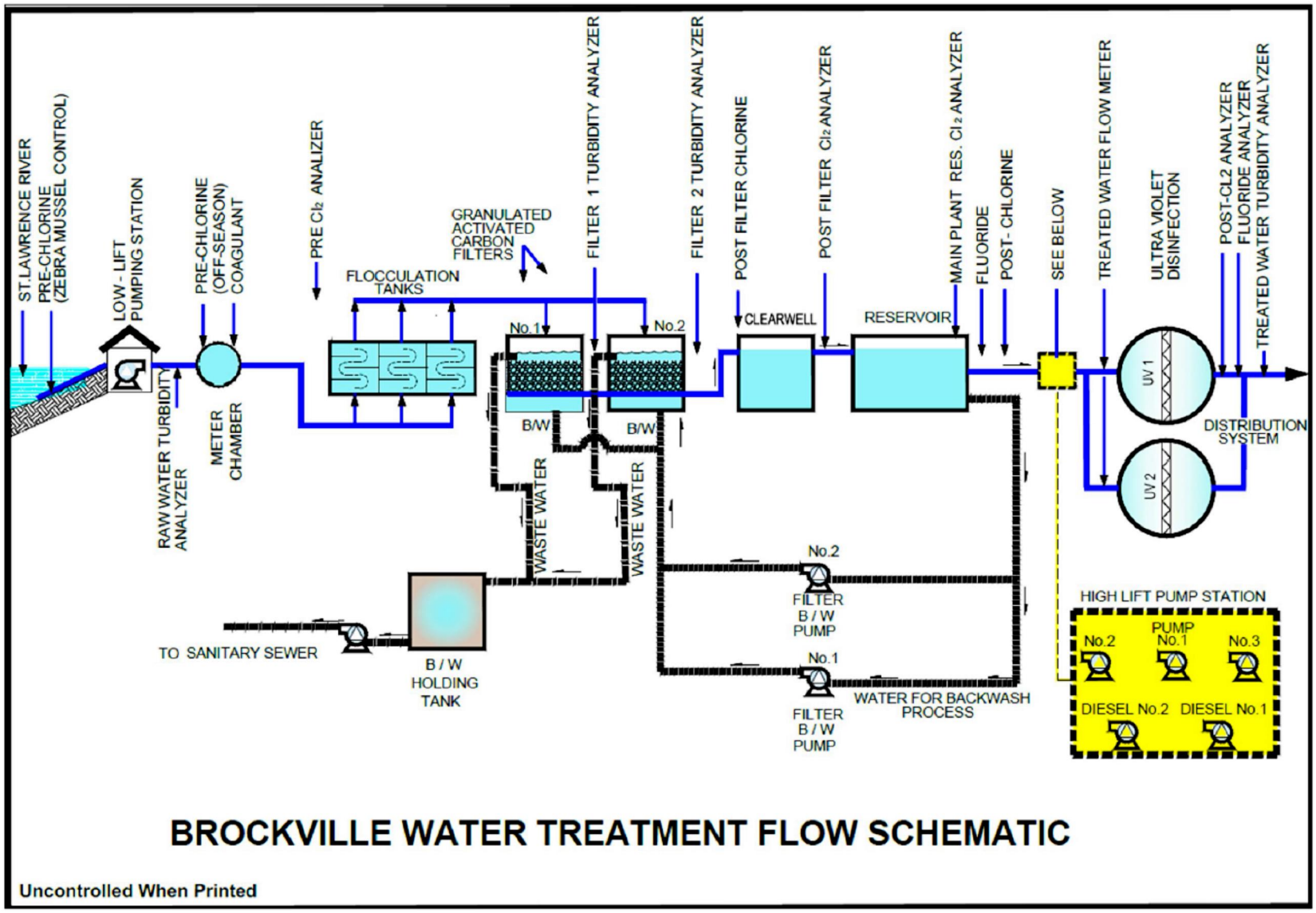
7. KEY CONTACTS

Craig Drake
Supervisor - Water Systems
Phone: 613-342-8772 ext. 5512
Fax: 613-345-6163
Email: cddrake@brockville.com

Peter Raabe, P. Eng.
Director of Environmental Services
Phone: 613-342-8772 ext. 3257
Fax: 613-342-5035
Email: praabe@brockville.com

City of Brockville Drinking Water Operational Plan

DRINKING WATER SYSTEM PROCESS DIAGRAM



BROCKVILLE WATER TREATMENT FLOW SCHEMATIC

Uncontrolled When Printed

2019 CAPITAL PROGRAM

PROJECT NAME:	Water Equipment/Construction	**YEAR PROPOSED:**	**2019**
LOCATION:	Brockville Water Treatment Plant, Trunk Distribution System and Booster Stations	**Cost Centre: 08WTPW**	
HISTORY:	LENGTH OF PROJECT:	Ongoing	
	YEAR FIRST INTRODUCED:	2001	
SCOPE:	Provides for the capital needs of the Water Treatment Plant, Trunk Distribution System and Booster Stations. Funding is provided through water revenues.		

PROJECT ID:	PROJECT DESCRIPTION:	PRJ. MGR:	BUDGET:
	WATER TREATMENT PLANT:		
07-5-898002-3010	Main Plant Variable Frequency Drives		110,000
03-5-383776-2010	Engineering - Coagulant Feed System Upgrades		25,000
03-5-383776-2010	Coagulant Feed System Upgrades		75,000
	OVERHEAD TANK		
03-5-383776-2010	Cathodic Protection / Exterior Paint Touchup		75,000
			285,000

WHY REQUIRED: Advantages & Benefits	Allows for coordinated planning of the Capital Requirements required to meet the needs of the Water Treatment system through the Water Distribution Reserve. This also ensures that all costs are being captured and financed through the water rates.

PREPARED BY (PROJECT MANAGER): D. RICHARDS
DATE: June 19, 2018

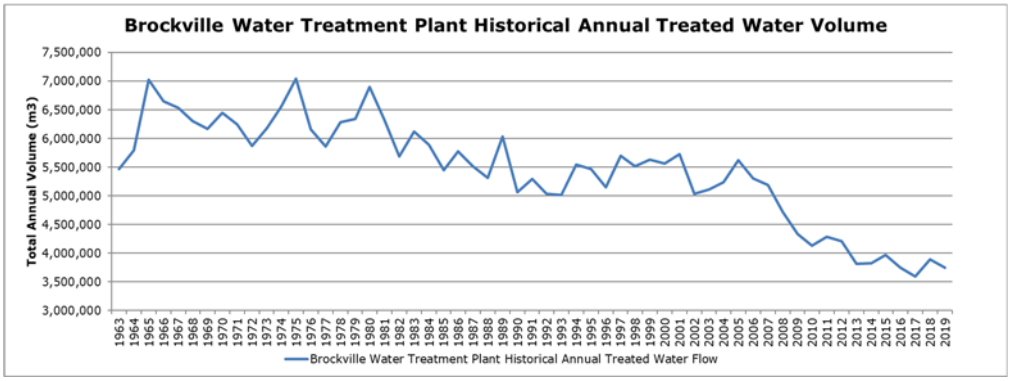
BROCKVILLE WATER SYSTEMS ANNUAL FLOW REPORT 2019

Month	WTP Raw Avg Flow (m3/day)	WTP Raw Max Flow (m3/day)	WTP Raw Peak Flow (L/min)	WTP Raw Total Flow (m3)	WTP Treated Avg Flow (m3/day)	WTP Treated Max Flow (m3/day)	Rated Capacity (m3/day)	Rated Flow Capacity (%)	WTP Treated Total Monthly Volume (m3)
January	11,595	13,643	19,317	359,456	10,934	12,831	36,400	35%	338,958
February	10,939	11,472	13,413	306,300	10,323	10,820	36,400	30%	289,057
March	10,701	11,312	12,699	331,721	10,025	10,419	36,400	29%	310,777
April	10,591	11,080	16,827	317,720	9,857	10,332	36,400	28%	295,724
May	10,959	13,383	23,577	339,734	10,156	12,349	36,400	34%	314,833
June	11,259	12,133	21,740	337,757	10,384	11,245	36,400	31%	311,515
July	12,310	13,543	21,036	381,597	11,391	12,579	36,400	35%	353,122
August	12,477	13,274	21,871	386,788	11,533	12,447	36,400	34%	357,520
September	11,698	12,582	29,310	350,958	10,775	11,671	36,400	32%	323,241
October	10,369	11,198	20,201	321,446	9,564	10,306	36,400	28%	296,489
November	9,749	10,414	12,623	292,484	9,096	9,858	36,400	27%	272,873
December	10,039	10,524	12,508	311,221	9,325	9,750	36,400	27%	289,090
TOTAL				4,037,180					3,753,200

BROCKVILLE WATER SYSTEMS HISTORICAL ANNUAL VOLUMES

Year	Annual Volume (m3)
1963	5,468,128
1964	5,792,558
1965	7,026,093
1966	6,652,020
1967	6,531,729
1968	6,302,901
1969	6,174,018
1970	6,447,978
1971	6,246,122
1972	5,876,886
1973	6,179,755
1974	6,552,608
1975	7,049,823
1976	6,157,384
1977	5,862,139
1978	6,283,413
1979	6,340,110
1980	6,905,996
1981	6,324,999
1982	5,685,995
1983	6,119,997
1984	5,894,998
1985	5,451,999
1986	5,780,998
1987	5,515,998
1988	5,319,997
1989	6,034,455
1990	5,064,771
1991	5,297,094
1992	5,037,999

Year	Annual Volume (m3)
1993	5,013,019
1994	5,548,256
1995	5,467,001
1996	5,148,340
1997	5,698,474
1998	5,519,157
1999	5,631,225
2000	5,565,808
2001	5,726,410
2002	5,032,500
2003	5,117,740
2004	5,238,190
2005	5,625,869
2006	5,308,800
2007	5,189,831
2008	4,715,116
2009	4,332,102
2010	4,128,747
2011	4,291,115
2012	4,213,592
2013	3,815,746
2014	3,822,724
2015	3,972,362
2016	3,744,720
2017	3,595,184
2018	3,889,242
2019	3,753,200

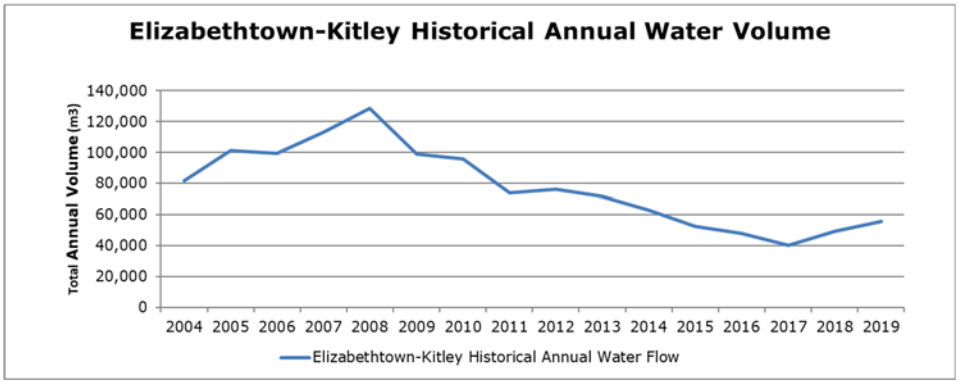


ELIZABETHTOWN-KITLEY WATER DISTRIBUTION ANNUAL VOLUME REPORT

Month	Avg Flow (m3)	Max Flow (l/min)	Total Volume (m3)
January	126	1,528	3,905
February	118	1,446	3,315
March	130	1,096	4,033
April	198	2,834	5,954
May	145	1,252	4,506
June	165	1,170	4,958
July	190	1,968	5,904
August	205	1,299	6,358
September	173	1,107	5,198
October	121	1,381	3,764
November	128	2,836	3,829
December	130	1,169	4,029
TOTAL			55,753

ELIZABETHTOWN- KITLEY WATER DISTRIBUTION HISTORICAL ANNUAL VOLUME

Year	TOTAL FLOW (m3)
2004	81,913
2005	101,402
2006	99,254
2007	113,068
2008	128,460
2009	98,782
2010	95,876
2011	74,052
2012	76,372
2013	71,552
2014	62,873
2015	52,646
2016	47,965
2017	40,185
2018	49,216
2019	55,753



BROCKVILLE
CITY OF THE 1000 ISLANDS

2019 WATER LOSS REPORT

	(m3)
Water Treatment Plant	3,753,199
Accounted for Water	
Water sold to customers	
Residential	1,080,383
Industrial	1,581,309
Sales to Elizabethtown-Kitley (East of Brockville)	65,803
Sales to Elizabethtown-Kitley (West of Brockville)	40,607
Total Billed Water	**2,768,102**
Total NRW	985,097
NRW Accounted for	26.2%
Flat Rate Water Users	44,100
Industrial Fire flow testing	5,000
Chlorinator Flow	
Watermain Breaks/Service Leaks	361,391
Anti-Freeze Taps	28,058
Fire Fighting and Training	2,080
Hydrant Fire Flow testing and flushing	24,538
Flushing Stations	75,390
Parks and Recreation Water Use	11,182
NRW used (accounted for)	**551,739**
	14.7%
Total Lost Water	**433,358**
Percentage of Lost Water	**11.55%**

Steve Allen, C.E.T.
February 17, 2020

Township of Elizabethtown-Kitley

2019 WATER LOSS REPORT

	(m3)
Flow Through Totalizer meter	55,751
TOTAL METERED WATER	**55,751**
Water sold to Residential Customers (west of totalizer)	40,607
Total Billed Water	**40,607**
Total NRW	**15,144**
	27.2%
NRW Accounted for	
Watermain Breaks	0
Localized Flushing for Sampling and Complaints	0
Hydrant Fire Flow testing	**1000
Flushing Stations	1,636
NRW Used (accounted for)	**1,636**
	2.9%
Total Lost Water	**13,508**
Percentage of Lost Water *	**24.23%**

Steve Allen
February 21, 2020