Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Annual Summary Report

Zurich Drinking Water System

2019

Prepared for the Municipality of Bluewater

By the Ontario Clean Water Agency

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SECTION 1

Statement of Compliance

This report is a summary of water quantity and quality information for the Zurich Drinking Water System and published in accordance with Schedule 22 of Ontario's Safe Drinking Water Act, Ontario Regulation 170/03 for the reporting period of January 1, 2019 to December 31, 2019. The Zurich Drinking Water System is categorized as a Large Municipal Residential Drinking Water System.

This report was prepared by the Ontario Clean Water Agency on behalf of the Municipality of Bluewater.

The Zurich Drinking Water System was operated and maintained in such a manner that the water supplied to the consumers serviced by the system satisfied all the requirements in the Safe Drinking Water Act, the Regulations, the Drinking Water Works Permit Number: 045-204, Issue Number: 02, the Municipal Drinking Water Licence Number: 045-104, Issue Number 5 and the Permit to Take Water 3617-9RXSNN. A Ministry of Environment, Conservation & Parks (MECP) inspection occurred February 21st 2019; one (1) non-compliance issues were identified. Inspection report # 1-ICT01 was received March 26th, 2019; inspection report rating was 100.00%.

SECTION 2

Details of the non-compliance issues as well as how and when any non-compliance issues were corrected

There was one (1) non-compliance issue identified during the February 21, 2019 MECP Inspection;. The MECP Inspection Report No. 1-ICT01 was received on March 26th, 2019 with an inspection report rating was 100.00 %.

Non-compliance:
The following instance of non-compliance was also noted during the inspection.
Concerns have arisen with discrepancies between daily treated water and total daily raw flow totals. Over the course of the review period, the daily treated water flow volumes have been 25% to 60% greater than raw flow volumes:

Action(s) Required:

1) By April 30, 2019, investigate the potential source of measurement anomalies on the treated flow meter, included but not limited to:
   a) Ensuring proper operation and functioning of the air relief valves located on the discharge piping of each of the high lift pumps;
   b) Elimination of any other source that may be causing entrained air to result in artificially high flow readings from the treated water flow meter, including with the assistance of a manufacturer's representative;
      i) the flow meter setup and piping configuration, and
      ii) the setup of the pressure relief-sustaining valve.
2) By April 30, 2019, submit a report to the issuing officer on:
   a) The results of investigations identified in item 1) above.
   b) Bluewater's timeline for construction of the proposed high-lift header replacement, routed so as to not pass through the reservoir.

Resolution:
Multiple troubleshooting activities were conducted in 2018 to determine why the TW flow meter was recording false high values. Management organized a site visit by all applicable parties to further investigate possible causes for the false high flow meter reading on April 17, 2019.

A report was submitted to MECP with the results of the site investigations as related to the false TW flow meter readings as requested. Ryan Steckly of BM Ross Engineers, submitted an activities timeline per the Zurich high lift header replacement project to Larry McGregor, Bluewater's Interim Director of Public Works. System upgrades to correct flow meter discrepancies were completed in August and September of 2019. Flow meter discrepancy issues are now resolved.

Details of adverse water quality or potential issues reported as well as how and when any adverse water quality issues were corrected

There was two (2) incidents of adverse water quality or potential for adverse water quality issues reported in 2019.

AWQI # 144461

On January 7, 2019 Adverse Water Quality Incident # 144461 was issued. A two inch service line was discovered leaking extensively. The line was isolated prior to the excavation of the break; OIC deemed this a Category 2 Watermain break.

Action(s) Required:
The waterline was repaired per MECP Watermain Disinfection Procedure. Waterlines were flushed and samples collected. Two samples from the affected area and one upstream sample were collected; all sample results were compliant.

Resolution:
January 7, 2019 samples submitted identified 0cfu/100ml

AWQI # 147165
On August 9, 2019 Adverse Water Quality Incident # 147165 was issued due to Total Coliform of 4cfu/100mL reported from a hydrant sample.

The Zurich DWS was undergoing upgrades at the time of this AWQI; samples were obtained during the upgrade as the system was being supplied by tankers. There were a total of nine samples obtained on August 7 from the tankers and in the distribution system. The adverse was from one of the samples taken from a hydrant in the distribution system, all other samples had no adverse results.

Action(s) Required:
Flushed and re-sampled from the location of the adverse and upstream and downstream locations of the adverse. Samples were collected on August 9th and 10th; resample results were compliant.

Resolution:
August 9, 2019 samples submitted identified 0cfu/100ml.
August 10, 2019 samples submitted identified 0cfu/100ml.

There were no spill incidents reported in 2019.

SECTION 3
Summary and discussion of quantity of water supplied

In accordance with Schedule 22-2 (3) “the report must also include the following information for the purpose of enabling the owner of the system to assess the capability of the system to meet existing and planned uses of the system.”

1. A summary of the quantities and totalized volume of water supplied during the period covered by this report including monthly averages, maximum daily and the annual total flow with respect to DWS #260001469.

The total flow for the reporting period for the Municipal Drinking Water License (License Number: 045 -104 Issue No. 5) for the Zurich Drinking Water System was 113,620.3 m^3/yr. The average monthly flow for 2019 was 9,468.4 m^3; the average daily flow was 310.71 m^3/ day. The maximum monthly flow for the reporting period was 15,929.83 m^3 recorded in August 2019. The maximum daily flow for 2019 was 613.84 m^3/ day and occurred on August 01, 2019.

Zurich Drinking Water System
2019 Water Flows - Cubic Meters

Month	Total Raw Flow m3	Total Treated Flow m3	Monthly Treated Average m3/day	Maximum Daily Treated Flow m3/day	Rated Capacity approved in MDWL (m3/d)
January	8626.98	8626.98	278.29	368.13	1,150
February	7522	7522	268.64	295.15	1,150
March	8374.53	8374.53	270.15	328.67	1,150
April	8094.26	8094.26	269.81	312.15	1,150
May	8834.78	8834.78	284.99	362.74	1,150
June	9683.24	9683.24	322.77	412.56	1,150
July	13220.99	13220.99	426.48	521.48	1,150
August	15929.83	15929.83	513.87	613.84	1,150
September	9587.42	9345.62	311.52	552.25	1,150
October	8459	8294.06	267.55	326.62	1,150
November	7716	7586	252.87	268	1,150
December	8283	8108	261.55	281	1,150
Total	114332	113620.3	-	-	-
Average	n/a	n/a	310.71	-	-

There were no exceedances of the rated capacity. The maximum daily flow for 2019 was 613.84.m³ on August 01, 2019, this is 53.4 % of the rated capacity. The average daily flow for 2019 was 310.71 m³ which is 27.02 % of the rated capacity.

Ontario **Drinking-Water Systems Regulation O. Reg. 170/03**

ANNUAL REPORT

Drinking-Water System Number:	220001469
Drinking-Water System Name:	Zurich Drinking Water System
Drinking-Water System Owner:	Municipality of Bluewater
Drinking-Water System Category:	Large Municipal Residential System
Period being reported:	January 1, 2019 – December 31, 2019

Complete if your Category is Large Municipal Residential or Small Municipal Residential	***Complete for all other Categories.***
Does your Drinking-Water System serve more than 10,000 people? No **Is your annual report available to the public at no charge on a web site on the Internet?** Yes **Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.** Corporation of the Municipality of Bluewater 14 Mill Ave., Zurich, Ontario N0M 2T0	**Number of Designated Facilities served:** Not applicable **Did you provide a copy of your annual report to all Designated Facilities you serve?** Not applicable **Number of Interested Authorities you report to:** Not applicable **Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility?** Not applicable

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:
Not applicable

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?
Not applicable

Indicate how you notified system users that your annual report is available, and is free of charge.

[X] Public access/notice via the web
[X] Public access/notice via Government Office-Water Department Office
[ ] Public access/notice via a newspaper
[X] Public access/notice via Public Request
[ ] Public access/notice via a Public Library
[ ] Public access/notice via other method _____

Describe your Drinking-Water System

The Zurich Water Supply and Distribution System serves the community of Zurich located in the Municipality of Bluewater; approximate population served is 1,000 with a rated capacity of 1,150 m³/ day.

Well: System uses two wells, one 88.4 m deep well and one 96.3 m deep well both equipped with a submersible pumps with a rated capacity of 13.3 L/s.

Pumphouse consisting of:
- Two raw piping systems equipped with a water meter, discharging into the reservoir
- Two vertical turbine high lift pumps each with a rated capacity of 11.3 L/s
- Two sodium hypochlorite chemical metering pumps each rated at 1.6 L/hr
- One 20 L sodium hypochlorite tank
- Two iron sequestering metering pumps (one duty and one standby)
- One 20 L sodium silicate tank
- Back-up power supplied by one 100 kW, 125 KVA diesel standby generator

List all water treatment chemicals used over this reporting period

Sodium Hypochlorite
Sodium Silicate

Were any significant expenses incurred to?

[X] Install required equipment
[X] Repair required equipment
[X] Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred:

The following system parts were purchased and /or repairs made in 2019;

- Watermain Repair - Water Service Repair
- Parts Inventory re-stocked
- SCADA Upgrade

Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
AWQI # 144461 issued January 7, 2019	OIC on site deemed repair a Category 2 Watermain break.	Total Coliform = 0 E. coli = 0	cfu/100ml	A 2" service line leak was deemed a Category 2 Watermain break by responding OIC. Repairs were completed; 2 samples collected in the affected area and 1 sample upstream of the affected area. All sample results were compliant	January 10, 2019
AWQI # 147165 issued August 9, 2019	Total Coliform Count	4	cfu/100ml	Flushed and re-sampled from the location of the adverse & upstream, downstream locations from adverse. Samples were taken on August 9th and 10th; resample results were compliant.	August 12, 2019

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

	Number of Samples	Range of E.Coli Or Fecal Results (min – max)	Range of Total Coliform Results (min – max)	Number of HPC Samples	Range of HPC Results (min – max)
Raw	106	0 – 0	0 – 0	-	-
Treated	53	0 – 0	0 – 0	53	<10 - 1630
Distribution	184	0 – 0	0 – 4	78	<10 - >2000

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

	Number of Grab Samples	Range of Results min- max
Raw Water Turbidity (NTU)	24	0.09 – 0.93
Treated Water Chlorine (mg/l)	*8760	0.75 – 1.39
Distribution Chlorine (mg/l)	374	0.44 – 1.37

* Continuous monitoring

Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

Not applicable

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

TREATED WATER	Sample Date (mm/dd/yyyy)	Sample Result	MAC	Exceedances	
				MAC	1/2 MAC
Antimony: Sb (ug/L) - TW	2/21/2017	< 0.02	6.0	No	No
Arsenic: As (ug/L) - TW	2/21/2017	8.3	25.0	No	No
Barium: Ba (ug/L) - TW	2/21/2017	34.7	1000.0	No	No
Boron: B (ug/L) - TW	2/21/2017	237	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2/21/2017	< 0.009	5.0	No	No
Chromium: Cr (ug/L) - TW	2/21/2017	0.62	50.0	No	No
Mercury: Hg (ug/L) - TW	2/21/2017	< 0.01	1.0	No	No
Selenium: Se (ug/L) - TW	2/21/2017	< 0.04	10.0	No	No
Uranium: U (ug/L) - TW	2/21/2017	0.860	20.0	No	No

TREATED WATER	Sample Date (mm/dd/yyyy)	Sample Result	MAC	Exceedances	
				MAC	1/2 MAC
Additional Inorganics					
Fluoride (mg/L) - TW	2/21/2017	2.09	1.5	Yes	Yes
Nitrite (mg/L) - TW	1/7/2019	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	4/1/2019	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	7/2/2019	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	10/7/2019	<MDL 0.003	1.0	No	No
Nitrate (mg/L) - TW	1/7/2019	<MDL 0.006	10.0	No	No
Nitrate (mg/L) - TW	4/1/2019	<MDL 0.006	10.0	No	No
Nitrate (mg/L) - TW	7/2/2019	<MDL 0.006	10.0	No	No
Nitrate (mg/L) - TW	10/7/2019	0.021	10.0	No	No
Sodium: Na (mg/l) – TW	2/21/2017	41.1	20	Yes	Yes
Sodium: Na (mg/L) - TW	2/27/2017	44.0	20	Yes	Yes

Summary of lead testing under Schedule 15.1 during this reporting period

Location Type	Date Sampled	Number of Samples	Range of Lead Results ug/l (min – max)	Alkalinity mg/l (min – max)	pH (min – max)	Number of Exceedances
Distribution	Mar. 25, 2019	2	0.47 – 0.89	168 - 183	6.70 – 6.75	0
Distribution	Sept. 12, 2019	2	0.08 – 0.10	160 - 162	6.55 – 6.91	0

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

Treated Water	Sample Date (mm/dd/yyyy)	Sample Result	Exceedances	
			MAC	1/2 MAC
Alachlor (ug/L) - TW	2/21/2017	< 0.02	5.00	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2/21/2017	< 0.01	5.00	No
Atrazine (ug/L) – TW	2/21/2017	<0.01	n/a	n/a
Azinphos-methyl (ug/L) - TW	2/21/2017	< 0.05	20.00	No
Benzene (ug/L) - TW	2/21/2017	< 0.32	1.00	No
Benzo(a)pyrene (ug/L) - TW	2/21/2017	< 0.004	0.01	No
Bromoxynil (ug/L) - TW	2/21/2017	< 0.33	5.00	No
Carbaryl (ug/L) - TW	2/21/2017	< 0.05	90.00	No
Carbofuran (ug/L) - TW	2/21/2017	< 0.01	90.00	No
Carbon Tetrachloride (ug/L) - TW	2/21/2017	< 0.16	2.00	No
Chlorpyrifos (ug/L) - TW	2/21/2017	< 0.02	90.00	No
Desethyl atrazine (ug/L) – TW	2/21/2017	<0.01	n/a	n/a
Diazinon (ug/L) - TW	2/21/2017	< 0.02	20.00	No
Dicamba (ug/L) - TW	2/21/2017	< 0.20	120.00	No
1,2-Dichlorobenzene (ug/L) - TW	2/21/2017	< 0.41	200.00	No
1,4-Dichlorobenzene (ug/L) - TW	2/21/2017	< 0.36	5.00	No
1,2-Dichloroethane (ug/L) - TW	2/21/2017	< 0.35	5.00	No
1,1-Dichloroethylene (ug/L) - TW	2/21/2017	< 0.33	14.00	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2/21/2017	< 0.35	50.00	No
2,4-Dichlorophenol (ug/L) - TW	2/21/2017	< 0.15	900.00	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2/21/2017	< 0.19	100.00	No
Diclofop-methyl (ug/L) - TW	2/21/2017	< 0.40	9.00	No
Dimethoate (ug/L) - TW	2/21/2017	< 0.03	20.00	No
Diquat (ug/L) - TW	2/21/2017	< 1.0	70.00	No
Diuron (ug/L) - TW	2/21/2017	< 0.03	150.00	No
Glyphosate (ug/L) - TW	2/21/2017	< 1.0	280.00	No
Malathion (ug/L) - TW	2/21/2017	< 0.02	190.00	No
Metolachlor (ug/L) - TW	2/21/2017	< 0.01	50.00	No
Metribuzin (ug/L) - TW	2/21/2017	< 0.02	80.00	No
MCPA (mg/L) – TW	2/21/2017	0.00012	0.1	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2/21/2017	< 0.3	80.00	No
Paraquat (ug/L) - TW	2/21/2017	< 1.0	10.00	No
PCB (ug/L) - TW	2/21/2017	< 0.04	3.00	No
Pentachlorophenol (ug/L) - TW	2/21/2017	< 0.15	60.00	No
Phorate (ug/L) - TW	2/21/2017	< 0.01	2.00	No
Picloram (ug/L) - TW	2/21/2017	< 1.0	190.00	No
Prometryne (ug/L) - TW	2/21/2017	< 0.03	1.00	No
Simazine (ug/L) - TW	2/21/2017	< 0.01	10.00	No
Terbufos (ug/L) - TW	2/21/2017	< 0.01	1.00	No
Tetrachloroethylene (ug/L) - TW	2/21/2017	< 0.35	30.00	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2/21/2017	< 0.20	100.00	No
Triallate (ug/L) - TW	2/21/2017	< 0.01	230.00	No
Trichloroethylene (ug/L) - TW	2/21/2017	< 0.44	5.00	No
2,4,6-Trichlorophenol (ug/L) - TW	2/21/2017	< 0.25	5.00	No
Trifluralin (ug/L) - TW	2/21/2017	< 0.02	45.00	No
Vinyl Chloride (ug/L) - TW	2/21/2017	< 0.17	2.00	No

DISTRIBUTION WATER	Running Annual Average	Result Value	Unit of Measure ug/l	Exceedance
Trihalomethane: Total (ug/L):show the latest annual average	January – December 2019	17.75	ug/l	No
Total Haloacetic Acids: Total (ug/L):show the latest annual average	January – December 2019	< 5.3	ug/l	NA

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
Jan. 20 2017	Fluoride	1.75	mg/l	Re-sampled	Jan. 26 2017
Jan. 26 2017	Fluoride	2.08	mg/l	Naturally occurring; no further action	Not applicable
Feb. 21 2017	Sodium	41.1	mg/l	Re-sampled	Feb. 27 2017
Feb. 27 2017	Sodium	44.0	mg/l	Naturally occurring; no further action	Not applicable