Ontario Clean Water Agency
Agence Ontarienne Des Eaux

March 22, 2017

Amanda Froese, Director of Public Works
Town of Saugeen Shores
600 Tomlinson Dr.
Box 820
Port Elgin, Ontario
N0H 2C0

Re: Annual Report (amended) Version 2, Requirement under O. Reg. 170/03, Section 11

Dear Ms. Froese,

Further to the 2016 Annual Report that was submitted on February 28, 2017, attached is the 2016 Annual Report (amended) Version 2 for the Saugeen Shores Drinking Water System. The revisions made to Version 2 of the document are:

- In regards to the *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:*
  - Corrected the Date of the Incident to 2016/01/10
  - Corrected the Corrective Action Date to 2016/01/10
  - Specified that it was a water supply valve
  - Specified that it was water flow

This report was completed in accordance with Section 11 of Ontario Regulation 170/03. It is required that an Annual Report for the previous calendar year be prepared no later than February 28th of each year.

Section 12 of Ontario Regulation 170/03 requires that the Annual Report be made available for inspection, at no charge, by any member of the public during regular business hours. The report should be made available for inspection at the office of the Municipality or at a location that is convenient for the users of the water system.

Should you require further clarification of information regarding this report, please feel free to contact me.

Kind regards,

Karen Lorente

Karen Lorente
Regional Hub Manager
OCWA, Georgian Highlands Region

Ontario Clean Water Agency
Agence Ontarienne Des Eaux

SAUGEEN SHORES
DRINKING WATER SYSTEM

Large Municipal Residential

SECTION 11
ANNUAL REPORT

For the period of
JANUARY 1, 2016 TO DECEMBER 31, 2016

Prepared by the Ontario Clean Water Agency
For the Town of Saugeen Shores

Drinking Water System Number:	210000078
Drinking Water System Name:	Saugeen Shores Drinking Water System
Drinking Water System Owner:	The Corporation of the Town of Saugeen Shores
Drinking Water System Category:	Large Municipal Residential
Reporting Period:	January 1, 2016 – December 31, 2016

Does the Drinking Water System serve more than 10,000 people?

Yes.

Is your annual report available to the public at no charge on a web site on the Internet?

Yes.

Location where the Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection:

Town of Saugeen Shores
600 Tomlinson Drive
Port Elgin, Ontario
N0H 2C0
519-832-2008

Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Saugeen First Nations

Did you provide a copy of the annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?

Yes

How system users are notified that the annual report is available, and is free of charge:

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

Description of Drinking Water System:

The Saugeen Shores Drinking Water System (DWS) is a Class III Treatment and a Class III Distribution System.

The Southampton Water Treatment Plant is supplied by Lake Huron, the treatment system consists of:

- Low lift pumping station (raw water well, treatment and control facilities, strainers)
- Membrane filtration systems (with a cleaning system and residuals management)
- Sodium Hypochlorite Treatment
- SCADA system with operation control instrumentation (including process and compliance monitoring)
- 2 generator sets (back-up power supply)

The distribution system is made up of the following:

- Storage reservoir, booster pump station
- Elevated storage tanks (2)
- Approximately 8 kilometers of trunk watermains
- Approximately 146 kilometers of distribution watermains

The Southampton WTP Facility provides treated water to Southampton and Port Elgin via the Saugeen Shores Distribution System. There are two pressure zones, Zone 1 and Zone 2. Zone 1 provides water to the Southampton portion of the Saugeen Shores Distribution System and Zone 2 provides water to the Port Elgin portion of the Saugeen Shores Distribution System.

The Southampton WTP draws raw water from Lake Huron through a 1600 m long, 762 mm diameter HDPE intake pipe with a raw water sample line and a chlorine gas feed line for zebra mussel control.

There is a 600 mm diameter concrete standby intake pipe, with a wooden intake crib and flat sealed top and a 38 mm diameter solution feed for zebra mussel control inside the concrete pipe. There is an underground inlet chamber equipped with a manually cleaned raw water screen.

The low lift pumping is located on the shores of Lake Huron consisting of a raw water well with a 20 m long by 14 m wide heated superstructure housing the pumping, treatment and control facilities. This includes:

- Three (3)VFD-controlled vertical turbine pumps (two duty, one standby) each rated at 104 L/s at a total dynamic head (TDH) of 37 m
- Two (2) self-cleaning strainers (one duty, one standby) with one (1) 1.5 m^3 strainer backwash wastewater storage tank
- Dual chlorine gas feeder sytem (duty and standby) each rated at 50 lbs/day (22.7 kg/day) and a chlorine feed line to the diffuser located in the mouth of the intake pipe for zebra mussel control and pre-chlorination
- a 230 kW diesel engine standby power generator set and associated equipment

The Southampton WTP is an approximately 31 m long by 19 m wide enclosed building located at 140 Island St., Southampton, ON. It houses the facilities described below, in addition to a laboratory/control room, electrical/mechanical room, storage room and washroom:

- Membrane Filtration System:
    - Four (4) individual submerged membrane trains (each with a capacity of 5950 m^3/day)
    - Five (5) permeate pumps (four duty, one shelf standby) each rated at 73 L/s at 11.5 m TDH
    - Two (2) back-pulse pumps (one duty, one standby) each rated at 73 L/s at 13.5 m TDH
    - Two (2) Clean-in-place (CIP) membrane wash pumps (one duty, one standby) each

rated at 56 L/s at 13.5 m TDH
    - Two (2) Vacuum Pumps (one duty, one standby) each rated at 22 L/s at 3.0 m TDH
    - Two (2) oil free compressors rated at 37.4 m^3/hr
    - Two (2) air blowers (one duty, one standby) each rated at 4.4 m^3/min at 31.5 kPa
    - A sodium hypochlorite feed system consisting of two metering pumps for recovery cleaning (one duty, one standby) with capacity of 28.1 L/min, two (2) metering pumps for biogrowth protection (one duty, one standby) with capacity of 2.78 L/min and one 1000 L storage tank
    - citric acid feed system consisting of two metering pumps (one duty and one standby) with capacity of 0.37 L/s and one 200 L storage tank
    - dechlorination feed system consisting of two metering pumps (one duty and one standby) with capacity of 2.06 L/min and one 200 L storage tank
    - sodium hydroxide feed system consisting of two metering pumps (one duty and one standby) with capacity of 2.83 L/min and one 60 L storage tank
- Membrane Wastewater Treatment System:
    - one flocculator/clarifier including coagulation and sedimentation chambers equipped with draining system discharging sludge by gravity to sanitary sewer
    - two equalization tanks with total volume of 160 m^3, for membrane back pulse water equalization
    - two tank drain/recirculation pumps (one duty and one standby) each rated at 24 L/s at 7.9 m TDH
    - two pumps (one duty and one standby) rated at 22 L/s at 12 m TDH to pump equalized wastewater to clarifier
    - alum feed system consisting of one storage tank and two mechanical metering pumps (one duty and one standby) each rated at 5.94 L/hr
    - one 25 m^3 neutralization tank
    - two 8.8 m long x 7 m wide decant chambers discharging clarifier effluent by gravity to the adjacent surface drainage ditch
    - dechlorination feed system consisting of two metering pumps (one duty and one standby) with capacity of 0.32 L/hr and storage tank
- Sodium Hypochlorite Disinfection System:
    - Two (2) storage tanks
    - Two (2) metering pumps (one duty, one standby) for post-chlorination, each rated at 20 L/hr
- High Lift Works:
    - Two (2) clear wells in parallel at the WTP with a total storage volume of 3720 m^3. It is complete with intra basin baffling for storage and chlorine contact
    - Four (4) vertical turbine pumps (one duty, three standby). Pump #1 has a rated capacity of 50 L/s at TDH of 49.9m, Pumps #2 and #3 have a rated capacity at 60 L/s at a TDH of 49.9 m, and Pump #4 has a rated capacity at 54 L/s at a TDH of 79.9 m.
    - Zone 2: Three (3) vertical turbine pumps (one duty, two standby), each rated at 54 L/s at a TDH of 80 m
- Standby Power
    - 750 kW diesel engine standby power generator set and associated equipment located in a separate room of the Plant Enclosure Building.

Treated water may be fed from Zone 1 to fill Zone 2 in case of an emergency condition or failure of either Zone 1 or Zone 2 Pumps, using Pump #4.

List of water treatment chemicals used during the reporting period:

- Sodium Hypochlorite 12%
- Poly-aluminum chloride
- Citric Acid
- Sodium Hydroxide
- Calcium Thiosulphate

Significant expenses were incurred to:

X	Install required equipment
X	Repair required equipment
X	Replace required equipment
	No significant expenses were incurred

Description of expenses:

- Pretreatment at the LLPS was converted from sodium hypochlorite to chlorine gas.
- Replacement/refurbishment of Pump#1, Zone 1
- Hydrant and secondary valve replacement
- Valve box replacement/ maintenance, raising level repair
- Hydrant parts, conversion kits
- Watermain and services as part of Summerside Development (along Devonshire Road and Waterloo Street)
- Bricker St. N end, watermain tie-ins Highway 21 & 6th & Guyers
- Abandon dead end at South Rankin and Shore Road
- Installation of new dialer at the highlift pumping station.
- Installation of new water trunk main

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:

Date of Incident (yyyy/mm/dd)	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date (yyyy/mm/dd)
2016/01/10	Free Chlorine Residual	0	mg/L	OA operator received a call-in to the MacGregor Park facility due to a low chlorine alarm. OA operator arrived on-site and surveyed the facility. The operator observed that the water supply valve to the main line coming in was completely closed and that there was no water flow. OA operator restored water flow to the line and observed a chlorine residual of 0.8 mg/L. The purpose of the water shut-off by MacGregor Park employees was due to a water leak.	2016/01/10

Table 1. Microbiological testing done under Schedule 10, 11 or 12 of Regulation 170/03 during this reporting Period

Location	Number of Samples	Range of E.coli Results		Range of Total Coliforms Results		Number of HPC Samples	Range of HPC Samples	
		Minimum	Maximum	Minimum	Maximum		Minimum	Maximum
Raw (RW)	52	0	50	0	4800	n/a	n/a	n/a
Treated (TW)	52	0	0	0	0	52	0	46
Distribution (DW)	310	0	0	0	0	105	0	300

Table 2. Operational testing done under Schedule 7, 8 or 9 during the period covered by this Annual Report.

	Number of Grab Samples	Range of Results	
		Minimum	Maximum
Turbidity, Filter 1 (NTU)	8760	0	0.553
Turbidity, Filter 2 (NTU)	8760	0	0.565
Turbidity, Filter 3 (NTU)	8760	0	1
Turbidity, Filter 4 (NTU)	8760	0	0.17
Chlorine Residual - Zone 1 (mg/L)	8760	0.22	1.90
Chlorine Residual – Zone 2 (mg/L)	8760	0.82	1.83
Free Chlorine Residual – DW (mg/L)[1]	8760	0.00*	2.01

NOTE: Record the unit of measure if it is not milligrams per litre.
NOTE: For continuous monitors use 8760 as the number of samples
NOTE: Zone 1 & Zone 2 pumps pull from the same clearwell source, thus one can be used to verify the other.
*0.00 result caused by maintenance (membrane sensor change out), not a true reading.

Table 3. Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

Date of Order of MDWL	Parameter	Date Sampled	Annual Average Result	MDWL Allowable Annual Average Concentration	Annual Maximum Result	MDWL Allowable Maximum Concentration
April 29, 2016 MDWL #093-101 (Issue 2)	Filter Backwash Suspended Solids (composite)	Monthly	2 mg/L	15 mg/L	2 mg/L	25 mg/L

Table 4. Summary of Inorganic parameters tested during this reporting period or most recent sample results

Parameter	Sample Date	Sample Result	Exceedance
Antimony: Sb (ug/L) - TW	2016/01/05	0.06	No
Arsenic: As (ug/L) - TW	2016/01/05	0.4	No
Barium: Ba (ug/L) - TW	2016/01/05	14.4	No
Boron: B (ug/L) - TW	2016/01/05	15.5	No
Cadmium: Cd (ug/L) - TW	2016/01/05	<MDL 0.003	No
Chromium: Cr (ug/L) - TW	2016/01/05	0.11	No
Mercury: Hg (ug/L) - TW	2016/01/05	<MDL 0.01	No
Selenium: Se (ug/L) - TW	2016/01/05	0.13	No
Uranium: U (ug/L) - TW	2016/01/05	0.357	No
Fluoride (mg/L) - TW	2016/01/05	0.09	No
Nitrite (mg/L) - TW	2016/01/05	<MDL 0.003	No
Nitrite (mg/L) - TW	2016/04/04	<MDL 0.003	No
Nitrite (mg/L) - TW	2016/07/04	<MDL 0.003	No
Nitrite (mg/L) - TW	2016/10/03	<MDL 0.003	No
Nitrate (mg/L) - TW	2016/01/05	0.874	No
Nitrate (mg/L) - TW	2016/04/04	1.05	No
Nitrate (mg/L) - TW	2016/07/04	0.269	No
Nitrate (mg/L) - TW	2016/10/03	0.288	No
Sodium: Na (mg/L) - TW	2016/01/05	7.08	No

NOTE: There is no "MAC" for Sodium. The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.

[1] Data from 2016 SCADA Yearly Report. Chlorine residual of the Port Elgin Reservoir.

Table 5. Summary of lead testing under Schedule 15.1 during this reporting period.

Location Type	Number of Samples	Range of Lead Results		Number of Exceedances
		Minimum	Maximum	
Plumbing	n/a	n/a	n/a	n/a
Distribution (ug/L)	-	-	-	-

NOTE: This system now qualifies for the plumbing exemption as per Ontario Regulation 170/03 Schedule 15.1-5 (9) (10). Distribution lead samples are only taken every 36 months. The last set of distribution lead samples was taken in 2014. The next set of distribution lead samples is scheduled for 2017.

Table 6. Summary of Organic parameters sampled during this reporting period or most recent sample results.

Parameter	Sample Date	Result Value	Exceedance
Alachlor (ug/L) - TW	2016/01/05	<MDL 0.02	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2016/01/05	0.03	No
Azinphos-methyl (ug/L) - TW	2016/01/05	<MDL 0.05	No
Benzene (ug/L) - TW	2016/01/05	<MDL 0.32	No
Benzo(a)pyrene (ug/L) - TW	2016/01/05	<MDL 0.004	No
Bromoxynil (ug/L) - TW	2016/01/05	<MDL 0.33	No
Carbaryl (ug/L) - TW	2016/01/05	<MDL 0.05	No
Carbofuran (ug/L) - TW	2016/01/05	<MDL 0.01	No
Carbon Tetrachloride (ug/L) - TW	2016/01/05	<MDL 0.16	No
Chlorpyrifos (ug/L) - TW	2016/01/05	<MDL 0.02	No
Diazinon (ug/L) - TW	2016/01/05	<MDL 0.02	No
Dicamba (ug/L) - TW	2016/01/05	<MDL 0.2	No
1,2-Dichlorobenzene (ug/L) - TW	2016/01/05	<MDL 0.41	No
1,4-Dichlorobenzene (ug/L) - TW	2016/01/05	<MDL 0.36	No
1,2-Dichloroethane (ug/L) - TW	2016/01/05	<MDL 0.35	No
1,1-Dichloroethylene (ug/L) - TW	2016/01/05	<MDL 0.33	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2016/01/05	<MDL 0.35	No
2,4-Dichlorophenol (ug/L) - TW	2016/01/05	<MDL 0.15	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2016/01/05	<MDL 0.19	No
Diclofop-methyl (ug/L) - TW	2016/01/05	<MDL 0.4	No
Dimethoate (ug/L) - TW	2016/01/05	<MDL 0.03	No
Diquat (ug/L) - TW	2016/01/05	<MDL 1.0	No
Diuron (ug/L) - TW	2016/01/05	<MDL 0.03	No
Glyphosate (ug/L) - TW	2016/01/05	<MDL 1.0	No
Malathion (ug/L) - TW	2016/01/05	<MDL 0.02	No
Metolachlor (ug/L) - TW	2016/01/05	<MDL 0.01	No
Metribuzin (ug/L) - TW	2016/01/05	<MDL 0.02	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2016/01/05	<MDL 0.3	No
Paraquat (ug/L) - TW	2016/01/05	<MDL 1.0	No
PCB (ug/L) - TW	2016/01/05	<MDL 0.04	No
Pentachlorophenol (ug/L) - TW	2016/01/05	<MDL 0.15	No
Phorate (ug/L) - TW	2016/01/05	<MDL 0.01	No
Picloram (ug/L) - TW	2016/01/05	<MDL 1.0	No
Prometryne (ug/L) - TW	2016/01/05	<MDL 0.03	No
Simazine (ug/L) - TW	2016/01/05	<MDL 0.01	No
Terbufos (ug/L) - TW	2016/01/05	<MDL 0.01	No
Tetrachloroethylene (ug/L) - TW	2016/01/05	<MDL 0.35	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2016/01/05	<MDL 0.2	No
Triallate (ug/L) - TW	2016/01/05	<MDL 0.01	No
Trichloroethylene (ug/L) - TW	2016/01/05	<MDL 0.44	No
2,4,6-Trichlorophenol (ug/L) - TW	2016/01/05	<MDL 0.25	No
Trifluralin (ug/L) - TW	2016/01/05	<MDL 0.02	No
Vinyl Chloride (ug/L) - TW	2016/01/05	<MDL 0.17	No
Alachlor (ug/L) - TW	2016/01/05	<MDL 0.02	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2016/01/05	0.03	No
Azinphos-methyl (ug/L) - TW	2016/01/05	<MDL 0.05	No
Benzene (ug/L) - TW	2016/01/05	<MDL 0.32	No
Benzo(a)pyrene (ug/L) - TW	2016/01/05	<MDL 0.004	No

Bromoxynil (ug/L) - TW	2016/01/05	<MDL 0.33	No
Carbaryl (ug/L) - TW	2016/01/05	<MDL 0.05	No
Carbofuran (ug/L) - TW	2016/01/05	<MDL 0.01	No
Carbon Tetrachloride (ug/L) - TW	2016/01/05	<MDL 0.16	No
Chlorpyrifos (ug/L) - TW	2016/01/05	<MDL 0.02	No
Diazinon (ug/L) - TW	2016/01/05	<MDL 0.02	No
Dicamba (ug/L) - TW	2016/01/05	<MDL 0.2	No
1,2-Dichlorobenzene (ug/L) - TW	2016/01/05	<MDL 0.41	No
Trihalomethane: Total (ug/L) Annual Average - DW	2016 (Quarterly)	46.0	No

Table 7. List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Result Value	Unit of Measure	Date of Sample
n/a	n/a	n/a	n/a

NOTE: This is required only if DWS category is large municipal residential, small municipal residential, large municipal non-residential, small municipal non-residential, large non municipal non-residential)