

O.Reg 170 SECTION 11 ANNUAL REPORT

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| Drinking-Water System Number: | 210000078 |
| Drinking-Water System Name: | The Southampton Water Treatment Plant & Distribution System |
| Drinking-Water System Owner: | Town of Saugeen Shores |
| Drinking-Water System Category: | Large Municipal Residential |
| Period being reported: | January 1, 2013 to December 31, 2013 |

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| <p><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></p> <p>Does your Drinking-Water System serve more than 10,000 people? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</p> <div style="border: 1px solid black; padding: 5px;"> <p>Town of Saugeen Shores 600 Tomlinson Drive Port Elgin, Ontario N0H 2C0 519-832-2008</p> </div> | <p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served: <input style="width: 100px; height: 20px;" type="text"/></p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Number of Interested Authorities you report to: <input style="width: 100px; height: 20px;" type="text"/></p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes <input type="checkbox"/> No <input type="checkbox"/></p> |
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List Drinking-Water Systems, which receive all of their drinking water from your system:

- Saugeen First Nations

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?
Yes No

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

- Public access/notice via the web
- 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 _____

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Describe your Drinking-Water System

Class 3 Distribution, Class 3 Treatment

Note: The Southampton WTP Facility provides the treated water to Southampton and Port Elgin through the Saugeen Shores Distribution System. There are two pressure Zones. Zone 1 provides water to Southampton part of the Saugeen Shores Distribution System and Zone 2 provides water to Port Elgin part of Saugeen Shores Distribution System.

The Southampton Water Treatment Plant (WTP) draws its raw water from Lake Huron through a 1600 m long, 750 mm diameter intake pipe with a chlorine solution feed line for zebra mussel control and a raw water sample line. There is also a backup 600 mm diameter concrete pipe. It has 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 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 self-cleaning strainers (one duty and one standby) with a 1.5 m³ strainer backwash wastewater storage tank
- metering pumps (one duty and one standby) each rated at 20 L/hr and a chlorine solution feed line to the diffuser located in the mouth of the intake pipe for pre chlorination and/or zebra mussel control
- a 230 kW diesel engine standby power generator set and associated equipment

The Southampton WTP is approximately 31 m long by 19 m wide enclosed building located at 140 Island St. housing all the facilities described below as well as a laboratory/control room, an electrical/mechanical room, a storage room and a washroom.

The membrane filtration system is comprised of the following components:

- four individual submerged membrane trains (each with a capacity of 5950 m³/day
- five permeate pumps (four duty and one shelf standby) each rated at 73 L/s at 11.5 m TDH
- two back pulse pumps (one duty and one standby) each rated at 73 L/s at 13.5 m TDH
- two Clean-in-place (CIP) membrane wash pumps (one duty and one standby) each rated at 56 L/s at 13.5 m TDH
- two Vacuum Pumps (one duty and one standby) each rated at 22 L/s at 3.0 m TDH
- two oil free compressors rated at 37.4 m³/hr
- two air blowers (one duty and one standby) each rated at 4.4 m³/min at 31.5 kPa
- sodium hypochlorite feed system consisting of two metering pumps for recovery cleaning (one duty and one standby) with capacity of 28.1 L/min, two metering pumps for biogrowth protection (one duty and 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
- sodium bisulfate feed system (calcium thiosulphate as of July 2012) consisting of two metering pumps (one duty and one standby) with capacity of 2.06 L/min and one 60 L storage tank

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- 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

The Membrane Wastewater Treatment System is comprised of:

- 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 m³, 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 3.0 L/hr
- one 25 m³ neutralization tank
- two 8.8 m long x 7 m wide decant chambers discharging clarifier effluent by gravity to the adjacent surface drainage ditch
- sodium bisulfate feed system consisting of two metering pumps (one duty and one standby) with capacity of 0.32 L/hr and storage tank

There are two clear wells in parallel at the Water Treatment Plant with a total storage volume of 3720 m³. It is complete with intra basin baffling for storage and chlorine contact

There are also two sets of high lift pumps that consist of the following:

- Four vertical turbine pumps (two duty, two standby), two pumps rated at 60 L/s at a TDH of 50 m and one pump rated at 50 L/s at a TDH of 49.7 m and one pump rated at 65 L/s at a THD of 80 m.
- Three vertical turbine pumps (two duty, one standby), each rated at 54 L/s at a TDH of 80 m

A sodium hypochlorite disinfection system is used at the Southampton WTP. The system consists of two storage tanks and two metering pumps (one duty and one standby) for post chlorination, each rated at 20 L/hr

Finally, there is a 750 kW diesel engine standby power generator set and associated equipment located in a separate room of the Plant Enclosure Building.

List all water treatment chemicals used over this reporting period

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

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Were any significant expenses incurred to?

- Install required equipment
- Repair required equipment
- Replace required equipment

Describe

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| <p>Replaced protective coating on clarifier Replaced Zone #1 flow meter Replaced level transmitters Replaced Zone #2 check valves Rebuilt reservoir pumps Replaced reservoir SCADA/PLC Replaced high lift pump soft start controller</p> |
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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 |
|---------------|--|--------|-----------------|--|------------------------|
| 2013/06/26 | Filter Effluent Turbidity analyzer failure | | | Reset analyzer, third party field service and calibration. | 2013/06/26 |

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 (min #) - (max #) | Range of Total Coliforms Results (min #) - (max #) | Number of HPC Samples | Range of HPC Samples (min #) - (max #) |
|-------------------|-------------------|--|---|-----------------------|---|
| Raw - RW | 53 | 0 - 168 | 0 - 1,880 | | |
| Treated - TW | 53 | 0 - 0 | 0 - 0 | 53 | 0 - 6 |
| Distribution - DW | 321 | 0 - 0 | 0 - 0 | 109 | 0 - 3 |

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

| | Number of Grab Samples | Range of Results (#-#) |
|---|------------------------|--|
| Turbidity | 8760 | #1 0.013 – 0.656 NTU #2 0.000 – 0.588 NTU #3 0.013 – 1.000 NTU #4 0.002 – 1.000 NTU |
| Chlorine | 8760 | 0.12 – 2.39 |
| Chlorine Residual Distribution System | 365 | 0.70 – 1.57 |
| <i>NOTE: Record the unit of measure if it is not milligrams per litre.</i> | | |

NOTE: For continuous monitors use 8760 as the number of samples.

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

| Parameter | Sample Date | Sample Result | Exceedance |
|--------------------------|-------------|---------------|------------|
| Antimony: Sb (ug/L) - TW | 2013/01/14 | 0.02 | No |
| Arsenic: As (ug/L) - TW | 2013/01/14 | 0.50 | No |
| Barium: Ba (ug/L) - TW | 2013/01/14 | 14.80 | No |
| Boron: B (ug/L) - TW | 2013/01/14 | 23.00 | No |
| Cadmium: Cd (ug/L) - TW | 2013/01/14 | < 0.0030 | No |
| Chromium: Cr (ug/L) - TW | 2013/01/14 | 0.50 | No |
| Lead: Pb (ug/L) – DW | | | |
| Mercury: Hg (ug/L) - TW | 2013/01/14 | < 0.010 | No |
| Selenium: Se (ug/L) - TW | 2013/01/14 | < 1.00 | No |
| Sodium: Na (mg/L) - TW | 2013/01/14 | 6.94 | No |
| Uranium: U (ug/L) - TW | 2013/01/14 | 0.229 | No |
| Fluoride: F (mg/L) - TW | 2013/01/14 | 0.08 | No |
| Nitrite (mg/L) - TW | 2013/01/14 | < 0.0050 | No |
| Nitrite (mg/L) - TW | 2013/04/02 | < 0.0030 | No |
| Nitrite (mg/L) - TW | 2013/07/02 | < 0.0030 | No |
| Nitrite (mg/L) - TW | 2013/10/01 | < 0.0030 | No |
| Nitrate (mg/L) - TW | 2013/01/14 | 0.340 | No |
| Nitrate (mg/L) - TW | 2013/04/02 | 0.392 | No |
| Nitrate (mg/L) - TW | 2013/07/03 | 0.306 | No |
| Nitrate (mg/L) - TW | 2013/10/01 | 0.282 | No |

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

| Date of order or C of A | Parameter | Date Sampled | Result | C of A Limit | Unit of Measure |
|------------------------------|---------------------------------|--------------|-------------------------|--------------|-----------------|
| MDWL # 093-101 2011/08/01 | Suspended Solids (composite) | Monthly | Annual Average < 2.0 | 15 | mg/L |

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

| Parameter | Sample Date | Result Value | Exceedance |
|--|-------------|--------------|------------|
| Alachlor (ug/L) - TW | 2013/01/14 | < 0.02 | No |
| Aldicarb (ug/L) - TW | 2013/01/14 | < 0.01 | No |
| Aldrin + Dieldrin (ug/L) - TW | 2013/01/14 | < 0.01 | No |
| Atrazine + N-dealkylated metabolites (ug/L) - TW | 2013/01/14 | 0.03 | No |
| Azinphos-methyl (ug/L) - TW | 2013/01/14 | < 0.02 | No |
| Bendiocarb (ug/L) - TW | 2013/01/14 | < 0.01 | No |
| Benzene (ug/L) - TW | 2013/01/14 | < 0.32 | No |
| Benzo(a)pyrene (ug/L) - | 2013/01/14 | < 0.004 | No |
| Bromoxynil (ug/L) - TW | 2013/01/14 | < 0.33 | No |
| Carbaryl (ug/L) - TW | 2013/01/14 | < 0.01 | No |
| Carbofuran (ug/L) - TW | 2013/01/14 | < 0.01 | No |
| Carbon Tetrachloride (ug/L) - TW | 2013/01/14 | < 0.16 | No |
| Chlordane:Total (ug/L) - TW | 2013/01/14 | < 0.01 | No |
| Chlorpyrifos (ug/L) - TW | 2013/01/14 | < 0.02 | No |
| Cyanazine (ug/L) - TW | 2013/01/14 | < 0.03 | No |
| Diazinon (ug/L) - TW | 2013/01/14 | < 0.02 | No |
| Dicamba (ug/L) - TW | 2013/01/14 | < 0.20 | No |
| 1,2-Dichlorobenzene (ug/L) - TW | 2013/01/14 | < 0.41 | No |
| 1,4-Dichlorobenzene (ug/L) - TW | 2013/01/14 | < 0.36 | No |
| Dichlorodiphenyltrichloroethane(DDT) + metabolites (ug/L) - TW | 2013/01/14 | < 0.01 | No |

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| 1,2-Dichloroethane (ug/L) - TW | 2013/01/14 | < 0.35 | No |
| 1,1-Dichloroethylene (ug/L) - TW | 2013/01/14 | < 0.33 | No |
| Dichloromethane (ug/L) - TW | 2013/01/14 | < 0.35 | No |
| 2,4-Dichlorophenol (ug/L) - | 2013/01/14 | < 0.15 | No |
| 2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW | 2013/01/14 | < 0.19 | No |
| Diclofop-methyl (ug/L) - TW | 2013/01/14 | < 0.40 | No |
| Dimethoate (ug/L) - TW | 2013/01/14 | < 0.03 | No |
| Dinoseb (ug/L) - TW | 2013/01/14 | < 0.36 | No |
| Diquat (ug/L) - | 2013/01/14 | < 1.0 | no |
| Diuron (ug/L) - TW | 2013/01/14 | < 0.03 | No |
| Glyphosate (ug/L) - | 2013/01/14 | < 6 | No |
| Heptachlor+Hepachlor Epoxide (ug/L) - TW | 2013/01/14 | < 0.01 | No |
| Lindane: (ug/L) - TW | 2013/01/14 | < 0.01 | No |
| Malathion (ug/L) - TW | 2013/01/14 | < 0.02 | No |
| Methoxychlor (ug/L) - TW | 2013/01/14 | < 0.01 | No |
| Metolachlor (ug/L) - TW | 2013/01/14 | < 0.01 | No |
| Metribuzin (ug/L) - TW | 2013/01/14 | < 0.02 | No |
| Monochlorobenzene (ug/L) - TW | 2013/01/14 | < 0.30 | No |
| Paraquat (ug/L) - | 2013/01/14 | < 1 | No |
| Parathion (ug/L) - TW | 2013/01/14 | < 0.02 | No |
| Pentachlorophenol (ug/L) - TW | 2013/01/14 | < 0.15 | No |
| Phorate (ug/L) - TW | 2013/01/14 | < 0.01 | No |
| Picloram (ug/L) - TW | 2013/01/14 | < 0.25 | No |
| Polychlorinated Bichenysl(PCB) (ug/L) - | 2013/01/14 | < 0.04 | No |
| Prometryne (ug/L) - TW | 2013/01/14 | < 0.03 | No |
| Simazine (ug/L) - TW | 2013/01/14 | < 0.01 | No |
| ***THM (ug/L) - DW | 2013 | 27.0 | No |
| Temephos (ug/L) - TW | 2013/01/14 | < 0.01 | No |
| Terbufos (ug/L) - TW | 2013/01/14 | < 0.01 | No |
| Tetrachloroethylene (ug/L) - TW | 2013/01/14 | < 0.35 | No |
| 2,3,4,6-Tetrachlorophenol (ug/L) - TW | 2013/01/14 | < 0.14 | No |
| Triallate (ug/L) - TW | 2013/01/14 | < 0.01 | No |
| Trichloroethylene (ug/L) - TW | 2013/01/14 | < 0.43 | No |

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|--|------------|--------|----|
| 2,4,6-Trichlorophenol (ug/L) - TW | 2013/01/14 | < 0.25 | No |
| 2,4,5-Trichlorophenoxy acetic acid (ug/L) - TW | 2013/01/14 | < 0.22 | No |
| Trifluralin (ug/L) - TW | 2013/01/14 | < 0.02 | No |
| Vinyl Chloride (ug/L) - TW | 2013/01/14 | < 0.17 | No |

*** Annual average (THMs)

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 |
|-----------|--------------|-----------------|----------------|
| | | | |

(Only if DWS category is large municipal residential, small municipal residential, large municipal non residential, small municipal non residential, large non municipal non residential)

Summary of lead testing under Schedule 15.1 during this reporting period

(applicable to the following drinking water systems; large municipal residential systems, small municipal residential systems, and non-municipal year-round residential systems)

| Location Type | Number of Samples | Range of Lead Results (min#) – (max #) | Number of Exceedances |
|---------------------|-------------------|---|-----------------------|
| Plumbing | 0 | | |
| Distribution | 0 | | |

This system now qualifies for the plumbing exemption as per Ontario Regulation 170/03 schedule 15.1-5 (9) (10). The next round distribution lead sampling is scheduled for the 2014 winter sampling period.