ANNUAL REPORT

Drinking-Water System Number:	260005502
Drinking-Water System Name:	Southwest Middlesex Distribution System
Drinking-Water System Owner:	Corporation of the Municipality of Southwest Middlesex
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1st to December 31st, 2018

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? Yes [ ] No [X] **Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No [ ]** **Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.** 153 McKellar St. Glencoe, ON N0L 1M0	**Number of Designated Facilities served:** **Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [ ] No [ ]** **Number of Interested Authorities you report to:** **Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [ ] No [ ]**

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

Drinking Water System Name	Drinking Water System Number
Newbury Distribution System	260005463
Bothwell Distribution System	260002551

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 [X] No [ ]

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**
- **[ ] Public access/notice via a newspaper**
- **[X] Public access/notice via Public Request**
- **[X] Public access/notice via a Public Library**
- **[ ] Public access/notice via other method _____**

Describe your Drinking-Water System

The Southwest Middlesex Distribution System services the communities of Melbourne, Appin, Glencoe, Wardsville and rural areas of Southwest Middlesex receiving water from the West Elgin Distribution System.

In addition to the watermains, valves, and fire hydrants, the Southwest Middlesex Distribution System consists of a reservoir, a high lift pumping station, re-chlorination facilities and elevated storage facilities.

The following are significant features on the system:

Southwest Middlesex Booster Pumping Station:

Reservoir

-One two-celled ground reservoir located on Graham Road in the Village of West Lorne which has an approximate volume of 1893 m^3.

High Lift Pumping Station

-Four fixed speed horizontal split-case pumps: 2 pumps rated for 2943m^3/d and 2 emergency backup pumps rated for 1226m^3/d, with a firm pumping capacity of 5395m^3/d.
-One flow meter installed on the common outlet pipe

Re-chlorination

-Sodium hypochlorite re-chlorination system, equipped with two chemical metering pumps to feed either to the inlet of the reservoir or discharge outlet line from the pump station
-SCADA controls for supplying water to the Southwest Middlesex Distribution System along with monitoring and alarms

Glencoe Tower:

-Two chemical metering pumps for sodium hypochlorite discharging to the outlet of the tower
-One 200L chemical solution storage tank with secondary containment
-Capacity of 3600m^3
-SCADA for monitoring and alarms

Melbourne Chamber:
-flow control valve operated by the SCADA system to maintain levels and pressure in the Melbourne and Glencoe distribution systems.

Melbourne Standpipe:
-Two chemical metering pumps for sodium hypochlorite discharging to the standpipe outlet
-One 200L chemical solution storage tank with secondary containment
-Capacity 1589m^3
-SCADA for monitoring and alarms

List all water treatment chemicals used over this reporting period

Sodium Hypochlorite 12%

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

-Heater repairs
-Pipe replacement at Southwest Reservoir
-Pump repairs
-Installed new pH probe at reservoir
-Installed new Chlorine injector at Glencoe Tower
-SCADA computer replaced
-New PRV at Pratt Siding
Hydrant and secondary valve repairs
-Watermain and service repairs

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
N/A	N/A	N/A	N/A	N/A	N/A

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

	No. of Samples Collected for period being reported	Range of E.Coli Results		Range of Total Coliform Results		Number of HPC Samples	Range of HPC Results	
		Minimum #	Maximum #	Minimum #	Maximum #		Minimum #	Maximum #
Distribution	325	0	0	0	0	171	0	2000

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

	No. of Samples Collected for period being reported	Range of Results	
		Minimum	Maximum
Free Chlorine Residual (mg/L)	472	0.16	3.80

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

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

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
n/a	n/a	n/a	n/a	n/a

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 Results		MAC (ug/L)	Number of Exceedances
		Minimum	Maximum		
Distribution - Lead Results (μg/L)	0	n/a	n/a	n/a	n/a
Distribution - Alkalinity (mg/L)	6	93	102	n/a	n/a
Distribution - pH	6	6.97	7.60	n/a	n/a

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

DISTRIBUTION WATER	Sample Date (mm/dd/yyyy)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Trihalomethane: Total (µg/L)	Running Average	81.75	100.00	No	Yes
Haloacetic Acid: Total (ug/L)	Running Average	20.25	n/a	n/a	n/a

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
THM	81.75	µg/L	Running Annual Average

ANNUAL REPORT

Drinking-Water System Number:	260091117
Drinking-Water System Name:	Tri-County Drinking Water System
Drinking-Water System Owner:	Tri-County Water Board
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1st to December 31st, 2018

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? Yes [ ] No [X] **Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No [ ]** **Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.** West Elgin Municipal Office 22413 Hoskins Line Rodney, ON N0L 2C0	**Number of Designated Facilities served:** **Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [ ] No [ ]** **Number of Interested Authorities you report to:** **Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [ ] No [ ]**

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

Drinking Water System Name	Drinking Water System Number
West Elgin Distribution System	260094627

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 [X] No [ ]

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**
- **[ ] 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 Tri-County Drinking Water System consists of the Tri-County Water Treatment Plant (WTP) and the Tri-County Transmission Main. The Tri-County WTP is a membrane filtration surface water treatment facility with a total design capacity of 12,160m^3/day, located at 9210 Graham Road in the Municipality of West Elgin. The low lift pumping station is located south of the WTP at 8662 Graham Road, on the shores of Lake Erie.

The water treatment facility consists of an intake system, a low lift pumping station, a treatment system and distribution pumping system. The Tri-County Drinking Water System serves the following systems: Southwest Middlesex, West Elgin, Dutton-Dunwich, Newbury and Bothwell Distribution Systems. The Southwest Middlesex and West Elgin Distribution Systems receive all their water directly from the Tri-County Drinking Water System. Dutton-Dunwich receives a portion of their water supply from the Tri-County Drinking Water System with the remainder coming from the Southwold Distribution System. Newbury and Bothwell Distribution Systems receive water indirectly from the Tri-County Drinking Water System via the Southwest Middlesex Distribution System.

Intake

The intake consists of one 700mm diameter polyethylene pipe extending approximately 610m into Lake Erie at a depth of 5.7m. A zebra mussel chemical control system is used seasonally. There is a second intake located at the shoreline, this is used only as a backup if required due to water quality or a blockage. The raw water is screened by two coarse screens.

Low Lift Pumping Station

Raw water is pumped from the low lift wet wells by four low lift pumps to the Water Treatment Plant.

Treatment Plant

Filtration

At the water treatment plant the water is pre-filtered by four automatic strainers to protect the filter membranes from coarser particles and algae in the raw water.

After the water has been strained it enters the membrane filtration system which removes fine particles, sediment, algae, protozoa and bacteria. Filtered water can be directed through the UV advanced oxidation process (AOP) unit to the treated water storage tanks.

Disinfection

Disinfection is achieved by the use of sodium hypochlorite for primary disinfection. Note that UV is intended for use with hydrogen peroxide (AOP) for taste and odour control. The treated water is stored in treated water storage tanks where it is pumped into the distribution network by the high lift pumps. Post chlorination of the treated water is done at two points. The first dosing point is upstream of the treated water storage tanks and the second dosing point is downstream of the four high lift pumps before the distribution header.

Process Drain Water
Waste water from the floor drains and online analyzers are directed to the process water handling facilities that include a settling basin and constructed wetlands. Flush water that cleans the pre-strainers and the membranes is also sent to the process water handling facilities.

Monitor and Control
The water treatment process and distribution components are controlled by a dedicated Supervisory Control and Data Acquisition (SCADA) computer system and monitored by certified operators.

Standby Power
Two diesel generators are available to permit the treatment plant to remain in operation should a power failure occur.

Distribution
The Tri-County Distribution System includes the transmission main to the West Lorne Standpipe.

West Lorne Standpipe
The West Lorne Standpipe capacity is 2,889m^3.

List all water treatment chemicals used over this reporting period

Chlorine Gas
Sodium Hypochlorite 12%
Hydrogen Peroxide 50%
Citric Acid 50%*
Caustic Soda 50%*
Calcium Thiosulfate (Captor) 30%*
*used in the cleaning process of the membranes

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

-Repairs to Air Compressor
-Replace valve positioner on surge relief valve
-SCADA maintenance
-Upgrade pneumatic manifolds
-Replace smart positioner on Rack 1, air compressor line,
-Highlift pump optimization
-Repair Milltronics sensor for storage tank
-Replaced chlorine probe
-Replace thermostat in chemical room
-Install pH control system with CO2 monitoring system
-Replace motor on excess recirculation pump
-UV reactor maintenance
-Replaced flow control valve on Rack 2
-Replaced motor and pump on low lift pump #1
-Replaced UPS battery back up on UV reactors
-Replaced safety valve on pressure tank
-Fix leak on Storage Tank #2
-Replaced solenoid valves on pressure relief valve
-Clean out low lift raw well
-Replaced pressure relief valve 7051, 7061
-Install new security system
-Upgrade communications with remote sites to fibre optic

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
2018-07-11	Total Coliform and E. coli	NDOGN	cfu/100mL	Resample	2017-07-13
2018-08-09	Total Coliform	1	cfu/100mL	Resample	2018-08-13

Note: NDOGN-No Data Overgrown with non-target bacteria

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

	No. of Samples Collected	Range of E.Coli Results (cfu/100mL)		Range of Total Coliform Results (cfu/100mL)		Number of HPC Samples	Range of HPC Results (cfu/mL)	
		Minimum	Maximum	Minimum	Maximum		Minimum	Maximum
RW	52	0	NDOGT*	0	NDOGT*	n/a	n/a	n/a
TW	55	0	0	0	0	55	<10	20
Distribution	110	0	0	0	8	108	<10	70

*NDOGT = No Data, overgrown with Target Bacteria

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 #)	Unit of Measure
Turbidity (Rack 1)	8760	0.01 – 0.65	ntu
Turbidity (Rack 2)	8760	0.01 – 7.24*	ntu
Turbidity (Rack 3)	8760	0.01 – 0.99	ntu
Turbidity (Rack 4)	8760	0.01 – 0.38	ntu
Free Chlorine (Primary Disinfection)	8760	0.92 – 3.03	mg/L
Free Chlorine (Secondary Disinfection)	8760	0.46 – 4.49	mg/L
Free Chlorine (Distribution—Grab)	420	0.64 – 2.08	mg/L

*Turbidity spikes lasted less than 1 minute

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

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

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
2017-04-21	Suspended Solids	2018-01-03 2018-04-03 2018-07-04 2018-10-02	297 54 3 3 Avg.: 89.3*	mg/L

*reported as a non-compliance of legislative requirements of the MDWL limit of 25mg/L, ref# 144796.

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

TREATED WATER	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
Antimony: Sb (ug/L) - TW	2018/01/09	0.14	6.0	No	No
Arsenic: As (ug/L) - TW	2018/01/09	1.1	10.0	No	No
Barium: Ba (ug/L) - TW	2018/01/09	22.3	1000.0	No	No
Boron: B (ug/L) - TW	2018/01/09	20.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2018/01/09	0.005	5.0	No	No
Chromium: Cr (ug/L) - TW	2018/01/09	0.14	50.0	No	No
Mercury: Hg (ug/L) - TW	2018/01/09	0.03	1.0	No	No
Selenium: Se (ug/L) - TW	2018/01/09	0.21	50.0	No	No
Uranium: U (ug/L) - TW	2018/01/09	0.362	20.0	No	No
Additional Inorganics					
Fluoride (mg/L) - TW	2014/05/12	0.11	1.5	No	No
Nitrite (mg/L) - TW	2018/01/02	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW					
Nitrite (mg/L) - TW	2018/07/03	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2018/10/01	<MDL 0.003	1.0	No	No
Nitrate (mg/L) - TW	2018/01/02	0.144	10.0	No	No
Nitrate (mg/L) - TW					
Nitrate (mg/L) - TW	2018/07/03	0.074	10.0	No	No
Nitrate (mg/L) - TW	2018/10/01	0.129	10.0	No	No
Sodium: Na (mg/L) - TW	2016/09/12	14.5	20*	No	Yes
*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.					

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 Results		MAC (ug/L)	Number of Exceedances
		Minimum	Maximum		
Distribution - Lead Results (ug/L)	4	0.01	0.01	10	0
Distribution - Alkalinity (mg/L)	4	94	97	n/a	n/a
Distribution - pH	4	7.58	8.32	n/a	n/a

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

TREATED WATER	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Alachlor (ug/L) - TW	2018/01/09	<MDL 0.02	5.00	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2018/01/09	0.09	5.00	No	No
Azinphos-methyl (ug/L) - TW	2018/01/09	<MDL 0.05	20.00	No	No
Benzene (ug/L) - TW	2018/01/09	<MDL 0.32	1.00	No	No
Benzo(a)pyrene (ug/L) - TW	2018/01/09	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TW	2018/01/09	<MDL 0.33	5.00	No	No
Carbaryl (ug/L) - TW	2018/01/09	<MDL 0.05	90.00	No	No
Carbofuran (ug/L) - TW	2018/01/09	<MDL 0.01	90.00	No	No
Carbon Tetrachloride (ug/L) - TW	2018/01/09	<MDL 0.16	2.00	No	No
Chlorpyrifos (ug/L) - TW	2018/01/09	<MDL 0.02	90.00	No	No
Diazinon (ug/L) - TW	2018/01/09	<MDL 0.02	20.00	No	No
Dicamba (ug/L) - TW	2018/01/09	<MDL 0.2	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW	2018/01/09	<MDL 0.41	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW	2018/01/09	<MDL 0.36	5.00	No	No
1,2-Dichloroethane (ug/L) - TW	2018/01/09	<MDL 0.35	5.00	No	No
1,1-Dichloroethylene (ug/L) - TW	2018/01/09	<MDL 0.33	14.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2018/01/09	<MDL 0.35	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW	2018/01/09	<MDL 0.15	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2018/01/09	<MDL 0.19	100.00	No	No
Diclofop-methyl (ug/L) - TW	2018/01/09	<MDL 0.4	9.00	No	No
Dimethoate (ug/L) - TW	2018/01/09	<MDL 0.03	20.00	No	No
Diquat (ug/L) - TW	2018/01/09	<MDL 1.0	70.00	No	No
Diuron (ug/L) - TW	2018/01/09	<MDL 0.03	150.00	No	No

TREATED WATER	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Glyphosate (ug/L) - TW	2018/01/09	<MDL 1.0	280.00	No	No
Malathion (ug/L) - TW	2018/01/09	<MDL 0.02	190.00	No	No
Metolachlor (ug/L) - TW	2018/01/09	0.02	50.00	No	No
Metribuzin (ug/L) - TW	2018/01/09	<MDL 0.02	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2018/01/09	<MDL 0.3	80.00	No	No
Paraquat (ug/L) - TW	2018/01/09	<MDL 1.0	10.00	No	No
PCB (ug/L) - TW	2018/01/09	<MDL 0.04	3.00	No	No
Pentachlorophenol (ug/L) - TW	2018/01/09	<MDL 0.15	60.00	No	No
Phorate (ug/L) - TW	2018/01/09	<MDL 0.01	2.00	No	No
Picloram (ug/L) - TW	2018/01/09	<MDL 1.0	190.00	No	No
Prometryne (ug/L) - TW	2018/01/09	<MDL 0.03	1.00	No	No
Simazine (ug/L) - TW	2018/01/09	<MDL 0.01	10.00	No	No
Terbufos (ug/L) - TW	2018/01/09	<MDL 0.01	1.00	No	No
Tetrachloroethylene (ug/L) - TW	2018/01/09	<MDL 0.35	10.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2018/01/09	<MDL 0.2	100.00	No	No
Triallate (ug/L) - TW	2018/01/09	<MDL 0.01	230.00	No	No
Trichloroethylene (ug/L) - TW	2018/01/09	<MDL 0.44	5.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW	2018/01/09	<MDL 0.25	5.00	No	No
2-methyl-4-chlorophenoxyacetic acid (MCPA) (ug/L) - TW	2018/01/09	<MDL 0.12	100.00	No	No
Trifluralin (ug/L) - TW	2018/01/09	<MDL 0.02	45.00	No	No
Vinyl Chloride (ug/L) - TW	2018/01/09	<MDL 0.17	1.00	No	No
DISTRIBUTION WATER					
Trihalomethane: Total (ug/L) Annual Average - DW	2018	36.8	100.00	No	No
HAA Total (ug/L) Annual Average - DW	2018	28.4		N/A	N/A

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