



OPTIONAL ANNUAL REPORT TEMPLATE

Drinking-Water System Number:	220001272
Drinking-Water System Name:	Perth Drinking Water System
Drinking-Water System Owner:	The Corporation of the Town of Perth
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1 2017 to Dec 31 2017

<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 [] No [x]</p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes [x] No []</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; margin-top: 10px;"> <p>The 2017 Summary Report will be prepared and forwarded to the Town of Perth Municipal Council by March 2018. Paper copies will be available at the Water Treatment Plant and electronic copies available on the municipal website.</p> </div>	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served: <input style="width: 100px;" type="text" value="20-25"/></p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [x] No [] Available on Website</p> <p>Number of Interested Authorities you report to: <input style="width: 100px;" type="text" value="n/a"/></p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [] No [] n/a</p>
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Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

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
Tay Valley Township	n/a

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.

- 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 _____

Describe your Drinking-Water System

Water Treatment Subsystem

The Water Treatment Plant is a Class III facility and was constructed in 1964 replacing the old Plant on Leslie Street, which was built in 1897. The water source is the Tay River, with our intake located at the Links O' Tay Golf Course. At the plant, conventional filtration practices are followed using a multiple barrier approach, including disinfection at various points in the process.

The surface water, or raw water, flows into the plant's intake wells, pretreated, and then onward to the raw water wells. The raw water's quantity and quality is monitored in order for proper chemical dosages to occur. Raw water pretreatment consists of double screening for solids, and disinfection when needed with chlorine dioxide. Water is then subject to the clarification process, involving coagulation, flocculation, and sedimentation stages. Clarified water under is the directed to the filtration process, where filter beds consisting of granular activated carbon and sand, further removes suspended solids. The filtered water's turbidity is continuously monitored and the filters are regenerated (backwashed) when required. Filter effluent water is directed to the clearwell for primary disinfection.

In the clearwell, the initial primary disinfection occurs as filter effluent water is exposed to the disinfecting agent, Sodium Hypochlorite. The treated water then passes to the reservoir, where further contact time is allowed to occur with the disinfectant. Prior to entering the reservoir, calcium hydroxide (lime) is added for pH adjustment, and fluoride (as recommended by the Ministry of Health).

The underground reservoir at the plant has a storage capacity of approximately 750,000 gallons (3,000,000 liters). It remains there until demand requires it in the distribution system. Before pumping the water directly into the distribution system, secondary disinfection occurs (sodium Hypochlorite) to bring the free chlorine residual up to a level required to maintain a residual throughout the distribution system.

A process wastewater residue management system is being put in place to now capture solids that were previously being directly back into the Tay River. A geo-tube membrane captures the solids and releases the cleaned discharge water. The sedimentation tank wastewater is currently being treated, with the filter backwash wastewater portion scheduled to be initiated in 2018.

Water Distribution Subsystem

The distribution subsystem is comprised of approximately 40 km of water mains constructed primarily of cast, PVC and ductile iron pipe ranging in diameter from 100 mm to 400mm. The system serves a population of approximately 6000, supplies approximately 2300 service connections, and has approximately 245 hydrant installations. A hydrant flushing program occurs twice a year, to help maintain the system integrity and proper operations.

An elevated tank, with storage capacity of 945 m³, provides system pressure and storage. In the fall of 2007 upgrades to the tank included installation of a water mixing system to ensure adequate disinfection is maintained while water is stored in the tank. The system is checked on a weekly basis to ensure that drinking water remains safe, free of bacteria and disinfected.



List all water treatment chemicals used over this reporting period

Poly-Aluminum Chloride (PAX XL-6 - coagulant)
 Activated Carbon (GAC – filter beds)
 Sodium Hypochlorite (Primary disinfection)
 Sodium Hypochlorite (Secondary Disinfection)
 Calcium Hydroxide (Lime – pH adjustment)
 Sodium Silicofluoride (Fluoride)
 Polymer (Geo-tube process sludge)
 Hydrochloric Acid (Chlorine Dioxide)
 Sodium Chlorite (Chlorine Dioxide)
 Sodium Hypochlorite (Chlorine Dioxide)

Were any significant expenses incurred to?

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

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

- Installation of SCADA programming upgrades to initiate process automation.
- Numerous operational components were upgraded or installed throughout the plant to allow for process automation to be developed for unmanned facility operations.
- Industrial UPS power units installed to allow a dedicated backup power to exist for several key and critical plant operations – required for on-site automation.
- Continued electrical and SCADA circuitry upgrades to allow further automation.
- Rebuilding of backwash control equipment, and link to SCADA communication.
- Electrical hook up and control panel link of air scour valves
- Replaced electrical panel for lime, fluoride automated ops, and linked to SCADA.
- Automated coagulant tank day tank filling installed, and linked to SCADA.
- Filter #2 actuator control panel installed for local ops.
- Preparation work for WTP 2018 Main MCC replacement
- Replacement of bulk Sodium Hypochlorite fill line.
- Replacement Sodium Hypochlorite metering pumps - suction header and vent pipe.
- Geo-tube polymer - barrel mixing setup, chemical suction system
- Replacement of Treated Water temperature probe, repairs to transmitter.
- Completed reservoir access #2 widening work, reservoir influent valve removal.
- WTP lighting to LED; WTP exterior door air gap sealing.
- Boulton Street water main replacement.
- Elevated tank communication system upgraded.

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

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	52	<2 - 900	12 - 3960	n/a	n/a
Treated	52	Absent in all Samples	Absent in all Samples	52	<10 - 20
Distribution	208	Absent in all Samples	Absent in all Samples	208	<10-70

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
Free Chlorine Residual (Primary Disinfection)	8760	0.52 - 1.86	mg/L
Free Chlorine Residual (Secondary Disinfection – WTP Effluent)	8760	1.10 – 2.37	mg/L
Free Chlorine Residual (Secondary Disinfection – Water Distribution)	365	0.07 – 2.00	mg/L
Turbidity (Filter #1)	8760	0.03 – 0.36	NTU
Turbidity (Filter #2)	8760	0.02 – 0.35	NTU
Fluoride	365	0.29 – 0.86	mg/L

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
MDWL 160-101 Sched C, sec 4.4	TSS (Residue Mgmt) (Phase I)	Annual Avg.	6.64	mg/L
		(16 Jan 2017)	(5.33)	
		(13 Feb 2017)	(13.33)	
		(13 Mar 2017)	(18.00)	
		(10 Apr 2017)	(6.67)	
		(08 May 2017)	(5.87)	
		(05 Jun 2017)	(4.00)	
		(09 Jul 2017)	(4.00)	
		(14 Aug 2017)	(4.33)	
		(11 Sep 2017)	(6.00)	
		(10 Oct 2017)	(4.00)	
		(14 Nov 2017)	(4.33)	
		(11 Dec 2017)	(4.00)	

MDWL 160-101 Sched C, sec 4.4	Total Chlorine Residual (Residue Mgmt) (Phase I)	Annual Avg. (Monthly Range)	0.002 (0.00-0.01)	mg/L
MDWL 160-101 Sched C, sec 4.1	Chlorate	16 Jan 2017 03 Apr 2017 10 July 2017 02 Oct 2017	0.16 0.08 0.22 0.19	mg/L mg/L mg/L mg/L
MDWL 160-101 Sched C, sec 4.1	Chlorite	16 Jan 2017 03 Apr 2017 10 July 2017 02 Oct 2017	<0.01 0.01 <0.01 <0.01	mg/L mg/L mg/L mg/L

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	10 July 2017	<0.0001	mg/L	N
Arsenic	10 July 2017	0.0003	mg/L	N
Barium	10 July 2017	0.039	mg/L	N
Boron	10 July 2017	0.015	mg/L	N
Cadmium	10 July 2017	<0.000014	mg/L	N
Chromium	10 July 2017	<0.002	mg/L	N
Mercury	10 July 2017	<0.00002	mg/L	N
Selenium	10 July 2017	<0.001	mg/L	N
Sodium	10 July 2017	0.00021	mg/L	N
Uranium	10 July 2017	<0.00005	mg/L	N
Nitrite	16 Jan 2017 03 Apr 2017 10 July 2017 02 Oct 2017	<0.1 <0.1 <0.1 <0.1	mg/L mg/L mg/L mg/L	N
Nitrate	16 Jan 2017 03 Apr 2017 10 July 2017 02 Oct 2017	0.3 <0.1 <0.1 <0.1	mg/L mg/L mg/L mg/L	N
Sodium	03 Apr 2017	11.5	mg/L	N
*Lead <i>Done along with Sched 15.1</i>	10 July 2017	0.00094	mg/L	N

*only for drinking water systems testing under Schedule 15.2; this includes large municipal non-residential systems, small municipal non-residential systems, non-municipal seasonal residential systems, large non-municipal non-residential systems, and small non-municipal non-residential systems

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 #)	Unit of Measure	Number of Exceedances
Plumbing	n/a			
Distribution (Jan 30, 2017)	3	0.00006 to 0.00722	mg/L	0

The Municipality was required to conduct lead sampling in the 2016 calendar year. As well, Distribution staff did record pH and Alkalinity of two separate samples (winter and summer).

Period	Number of Distribution Samples	Range of pH results (min#) – (max #)	Range of Alkalinity Results (min#) – (max #)	Temperature Range (min#) – (max #)
Dec 15, 2016- Apr 15, 2017 (Jan 30, 2017)	3	7.51 – 7.81	68-78	8.5 - 8.8
June 15, 2017- Oct 15, 2017 (Oct 03, 2017)	3	7.20 – 8.00	57-61	18.4 -20.4

The Municipality also conducted non-regulatory Inorganic Parameter Testing as part of a self-initiated drinking water quality assurance program.

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Fluoride <i>Done along with Sched 7.0</i>	03 Apr 2017	0.40	mg/L	N
Copper	16 Jan 2017	<0.002	mg/L	N
	10 July 2017	0.002		
Iron	16 Jan 2017	<0.005	mg/L	N
	10 July 2017	0.010		
Manganese	16 Jan 2017	0.020	mg/L	N
	10 July 2017	0.011		
Lead	10 July 2017	<0.00002	mg/L	N
Calcium	02 Oct 2017	23.6	mg/L	N
Aluminum	02 Oct 2017	0.04	mg/L	N
Sulphate	16 Jan 2017	31.0	mg/L	N
	10 July 2017	7.0		
Chloride	16 Jan 2017	37.0	mg/L	N
	10 July 2017	24.9		

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
THM (Total Trihalomethanes) (NOTE: show latest annual average)	Annual Average (16 Jan 017) (03 Apr 2017) (10 July 2017) (02 Oct 2017)	48.025 (36.8) (31.0) (62.4) (61.9)	µg/L	N

HAA (Haloacetic Acids)	Annual Average (16 Jan 2017) (03 Apr 2017) (10 July 2017) (02 Oct 2017)	49.850 (24.2) (24.6) (114.0) (36.6)	µg/L	N
Alachlor	10 July 2017	<0.3	µg/L	N
Atrazine + N-dealkylated metabolites	10 July 2017	<0.5	µg/L	N
Azinphos-methyl	10 July 2017	<1	µg/L	N
Benzene	10 July 2017	<0.5	µg/L	N
Benzo(a)pyrene	10 July 2017	<0.005	µg/L	N
Bromoxynil	10 July 2017	<0.3	µg/L	N
Carbaryl	10 July 2017	<3	µg/L	N
Carbofuran	10 July 2017	<1	µg/L	N
Carbon Tetrachloride	10 July 2017	<0.2	µg/L	N
Chlorpyrifos	10 July 2017	<0.5	µg/L	N
Diazinon	10 July 2017	<1	µg/L	N
Dicamba	10 July 2017	<5	µg/L	N
1,2-Dichlorobenzene	10 July 2017	<0.1	µg/L	N
1,4-Dichlorobenzene	10 July 2017	<0.2	µg/L	N
1,2-Dichloroethane	10 July 2017	<0.1	µg/L	N
1,1-Dichloroethylene (vinylidene chloride)	10 July 2017	<0.1	µg/L	N
Dichloromethane	10 July 2017	<0.3	µg/L	N
2-4 Dichlorophenol	10 July 2017	<0.1	µg/L	N
2,4-Dichlorophenoxy acetic acid (2,4-D)	10 July 2017	<5	µg/L	N
Diclofop-methyl	10 July 2017	<0.5	µg/L	N
Dimethoate	10 July 2017	<1	µg/L	N
Diquat	10 July 2017	<5	µg/L	N
Diuron	10 July 2017	<5	µg/L	N
Glyphosate	10 July 2017	<25	µg/L	N
Malathion	10 July 2017	<5	µg/L	N
MCPA (2-methyl-4-chlorophenoxyacetic acid)	10 July 2017	<0.00012	µg/L	N
Metolachlor	10 July 2017	<3	µg/L	N
Metribuzin	10 July 2017	<3	µg/L	N
Monochlorobenzene	10 July 2017	<0.2	µg/L	N
Paraquat	10 July 2017	<1	µg/L	N
Pentachlorophenol	10 July 2017	<0.1	µg/L	N
Phorate	10 July 2017	<0.3	µg/L	N
Picloram	10 July 2017	<5	µg/L	N
Polychlorinated Biphenyls (PCB)	10 July 2017	<0.05	µg/L	N
Prometryne	10 July 2017	<0.1	µg/L	N
Simazine	10 July 2017	<0.5	µg/L	N
Terbufos	10 July 2017	<0.3	µg/L	N
Tetrachloroethylene	10 July 2017	<0.2	µg/L	N
2,3,4,6-Tetrachlorophenol	10 July 2017	<0.1	µg/L	N
Triallate	10 July 2017	<10	µg/L	N
Trichloroethylene	10 July 2017	<0.1	µg/L	N
2,4,6-Trichlorophenol	10 July 2017	<0.1	µg/L	N

Trifluralin	10 July 2017	<0.5	µg/L	N
Vinyl Chloride	10 July 2017	<0.2	µg/L	N

The Municipality also conducted non-regulatory Inorganic Parameter Testing as part of a self-initiated drinking water quality assurance program.

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
THM (WTP discharge)	Annual Average	31.000	µg/L	N
	(16 Jan 017)	(27.0)		
	(03 Apr 2017)	(22.9)		
	(10 July 2017)	(39.5)		
	(02 Oct 2017)	(34.6)		

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
HAA (Haloacetic Acids)	49.850	µg/L	Annual Average