



## 2016 ANNUAL REPORT

<b>Drinking-Water System Number:</b>	<b>220001254</b>
<b>Drinking-Water System Name:</b>	<b>James W. King Water Treatment Plant</b>
<b>Drinking-Water System Owner:</b>	<b>Separated Town of Gananoque</b>
<b>Drinking-Water System Category:</b>	<b>Large Municipal Residential</b>
<b>Period being reported:</b>	<b>January 1, 2016 to December 31, 2016</b>

The Town of Gananoque owns and operates a Large Municipal Residential Water System. The annual report is available to the public at The Public Works Office at 665 Charles Street North, Gananoque between 7 AM and 3 PM and on the Town's website. Notification that this report is available for the public is achieved through the Town's website and Radio Station.

### **Description of Gananoque's Drinking-Water System**

The raw water source is the St. Lawrence River. Water enters the water plant via a 600 mm intake pipe which extends along the river bottom for 416 meters and terminates at depth of about 6 meters below the water surface. Chlorine is added at the intake or low lift wet well for zebra mussel control and disinfection.

Chlorinated raw water passes through two removable stationary screens into a wet well where one of three vertical turbine pumps, each having a capacity of 60 L/sec., pumps water into a rapid mix tank.

Water and alum are mixed together in the rapid mix chamber. Alum is a coagulant used to join suspended particles in the water into floc. Water then flows into the flocculation tanks where it is stirred gently to allow the particles of floc and suspended particles to join and create larger floc.

Two dual media filters each containing 750 mm of filter GAC over 250 mm of silica sand receives water from the flocculation tanks. The GAC media has eliminated the need for PAC addition seasonally for taste and odour control. These filters remove the floc as water passes through the dual media into clearwells.

Filtered water flows into the clearwells, storage reservoir and high left well. A total of 3,144 m<sup>3</sup> of treated water can be stored. Chlorine is added to the water as it first enters the clearwells to provide sufficient chlorine contact time and adequate free chlorine residual is maintained to ensure the water is safe for consumption.

For filter cleaning, called backwashing, air is forced backwards through the filter media to loosen the floc caught during filtration, and then treated water is pumped through the media in a reverse direction, to wash loosened floc and sediment into the backwash tanks. Each tank has a pump which discharges backwash water into the sanitary sewer system.

There are four high lift pumps: two 100 HP pumps in normal rotating operation and two 200 HP fire pumps, which move water to the distribution system and elevated water storage tank. Up to 1,327 m<sup>3</sup> of treated water is stored in the elevated water tank which supplies water to the distribution system when the high lift pumps are off. A 400 KVA diesel-driven standby generator provides enough power to run the water plant.

There are approximately 48 km of water mains; they range in size from 75 mm to 350 mm, and they supplied an average of 1737m<sup>3</sup> of water daily to the residents, businesses, and industries in Gananoque in 2016. There are approximately 230 fire hydrants connected to the distribution system.

The water plant provides multiple barriers against bacteriological contamination. Water samples are collected from the distribution system, raw water, and treated water weekly, quarterly and annually. Samples are sent to an accredited laboratory for analysis, satisfying the regulated sampling requirements. Chlorine levels in the distribution system are checked daily and at the time of sampling. chlorine residual and turbidity of the treated water is monitored continuously to ensure safe water leaving the plant.

**Chemicals used over this reporting period include:**

- Aluminum Sulfate
- Gaseous Chlorine

**Significant expenses incurred throughout the year:**

- Painting Water Treatment Plant Roof - \$67,000
- Gas Chlorination System- Ordered - \$65,000 (delivery and installation estimated March 2017)
- Victoria Avenue – Water portion of full replacement - \$783,000
- Henrietta Street – Water portion of full replacement -\$130,000
- Water Meter Replacement – Water portion only - \$63,000

**Microbiological testing done during this reporting period (Schedule 10 of ON reg. 170/03):**

	Number of Samples	Range of E.Coli Results (min #)-(max #)  Limit = 0 in finished water	Range of Total Coliform Results (min #)-(max #)  Limit = 0 in finished water	Range of HPC Results (min #)-(max #)  Limit = 500 cfu/ mL in finished water
<b>Raw</b>	52	0 - OG	0 - OG	NA
<b>Treated*</b>	52	0 - 0	0 - 0	<10 - 40
<b>Distribution*</b>	208	0 - 0	0 - 0	<10 - 80

**Operational testing done under Schedule 7 of Regulation 170/03 during the period covered by this Annual Report:**

	Number of Grab Samples	Range of Results (min #) - (max #)
<b>Turbidity(Filters)</b>	8760	0.025 – 1.131* NTU
<b>Chlorine(Treated)</b>	8760	1.64 – 3.99 mg/l
<b>Distribution Chlorine</b>	525	0.14 – 2.69 mg/l

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

\*This was a non-reportable event. 45-second duration spike returning immediately to normal.

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

Parameter	Sample Date	Result Value	Unit of Measure	Limit
<b>Antimony</b>	Jan 14/16	0.0002	mg/L	0.006
<b>Arsenic</b>	Jan 14/16	0.0004	mg/L	0.025
<b>Barium</b>	Jan 14/16	0.023	mg/L	1.0
<b>Boron</b>	Jan 14/16	0.020	mg/L	5.0
<b>Cadmium</b>	Jan 14/16	<0.00002	mg/L	0.005
<b>Chromium</b>	Jan 14/16	<0.002	mg/L	0.05
<b>*Lead (For Systems Testing Under Sch. 15.2)</b>	Oct. 20/15	0.00017	mg/L	0.01
<b>Mercury</b>	Jan 14/16	0.00002	mg/L	0.001
<b>Selenium</b>	Jan 14/16	0.001	mg/L	0.01
<b>Sodium</b>	Jan 13/15	14.1	mg/L	20
<b>Uranium</b>	Jan 14/16	0.00026	mg/L	0.02
<b>Fluoride</b>	Jan 13/15	0.2	mg/L	1.5
<b>Nitrite</b>	Jan 13/16	<0.1	mg/L	1.0
<b>Nitrate</b>	Jan13/16	0.3	mg/L	10.0

**Summary of lead testing under Schedule 15.1 during this reporting period:**

Location Type	Number of Samples (Locations)	Lead Results (mg/L) (min#) - (max#)	Number of Exceedances >0.01 mg/L (Individual Bottles)	Alkalinity (ppm) (min#) – (max #)
<b>Distribution</b>	-	-	-	-
<b>Residential</b>	7	0.00046-0.0101	1	-
<b>Non-Residential</b>	-	-	-	-

Note: The Town of Gananoque received relief from regulatory lead sampling requirements granted in Issue 4 (Draft) of the Municipal Drinking Water Licence beginning December 15, 2016 to April 15, 2017.

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

Parameter	Sample Date	Result Value	Unit of Measure	Limit
Alachlor	Jan 15/16	<0.3	ug/L	5
Aldicarb	Jan 13/15	<3	ug/L	9
Aldrin + Dieldrin	Jan 13/15	<0.02	ug/L	0.7
Atrazine + metabolites	Jan 15/16	<0.5	ug/L	5
Azinphos-methyl	Jan 15/16	<1	ug/L	20
Bendiocarb	Jan 13/15	<3	ug/L	40
Benzene	Jan 15/16	<0.5	ug/L	5
Benzo(a)pyrene	Jan 15/16	<0.005	ug/L	0.01
Bromoxynil	Jan 15/16	<0.3	ug/L	5
Carbaryl	Jan 15/16	<3	ug/L	90
Carbofuran	Jan 15/16	<1	ug/L	90
Carbon Tetrachloride	Jan 15/16	<0.2	ug/L	5
Chlordane (Total)	Jan 13/15	<0.04	ug/L	7
Chlorpyrifos	Jan 15/16	<0.5	ug/L	90
Cyanazine	Jan 13/15	<0.5	ug/L	10
Diazinon	Jan 15/16	<1	ug/L	20
Dicamba	Jan 15/16	<5	ug/L	120
1,2-Dichlorobenzene	Jan 15/16	<0.1	ug/L	200
1,4-Dichlorobenzene	Jan 15/16	<0.2	ug/L	5
Dichlorodiphenyltrichloroethane (DDT) + metabolites	Jan 13/15	<0.01	ug/L	30
1,2-Dichloroethane	Jan 15/16	<0.1	ug/L	5
1,1-Dichloroethene (vinylidene chloride)	Jan 15/16	<0.1	ug/L	14
Dichloromethane	Jan 15/16	<0.3	ug/L	50
2-4 Dichlorophenol	Jan 15/16	<0.1	ug/L	900
2,4-Dichlorophenoxy acetic acid (2,4-D)	Jan 15/16	<5	ug/L	100
Diclofop-methyl	Jan 15/16	<0.5	ug/L	9
Dimethoate	Jan 15/16	<1	ug/L	20
Dinoseb	Jan 13/15	<0.5	ug/L	10
Diquat	Jan 21/16	<5	ug/L	70
Diuron	Jan 15/16	<5	ug/L	150
Glyphosate	Jan 21/16	<25	ug/L	280
Heptachlor + Heptachlor Epoxide	Jan 13/15	<0.1	ug/L	3
Lindane (Total)	Jan 13/15	<0.1	ug/L	4
Malathion	Jan 15/16	<5	ug/L	190
Methoxychlor	Jan 13/15	<0.1	ug/L	900
Metolachlor	Jan 15/16	<3	ug/L	50
Metribuzin	Jan 15/16	<3	ug/L	80
Monochlorobenzene	Jan 15/16	<0.2	ug/L	80
Paraquat	Jan 21/16	<1	ug/L	10
Parathion	Jan 13/15	<3	ug/L	50
Pentachlorophenol	Jan 15/16	<0.1	ug/L	60
Phorate	Jan 15/16	<0.3	ug/L	2
Picloram	Jan 15/16	<5	ug/L	190
Polychlorinated Biphenyls(PCB)	Jan 19/16	<0.05	ug/L	3

Prometryne	Jan 15/16	<0.1	ug/L	1
Simazine	Jan 15/16	<0.5	ug/L	10
THM (NOTE: show latest annual average)	Jan. 12 , April 20 , July 15, Oct. 11 /16	23.33	ug/L	100
Temephos	Jan 13/15	<10	ug/L	280
Terbufos	Jan 15/16	<0.3	ug/L	1
Tetrachloroethylene	Jan 15/16	<0.2	ug/L	30
2,3,4,6-Tetrachlorophenol	Jan 15/16	<0.1	ug/L	100
Triallate	Jan 15/16	<10	ug/L	230
Trichloroethylene	Jan 15/16	<0.1	ug/L	5
2,4,6-Trichlorophenol	Jan 15/16	<0.1	ug/L	5
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	Jan 13/15	<10	ug/L	280
Trifluralin	Jan 15/16	<0.5	ug/L	45
Vinyl Chloride	Jan 15/16	<0.2	ug/L	2

### 2016 In-House Lab Results:

Daily in-house lab work is performed; values are compared to on-line analyzers for accuracy. Note: Turbidity off-the-filters is also tested in-house, this is included in the main body of the report within minimum and maximum values. In-house tested post chlorine residuals are also included within the continuous monitoring minimum and maximum values.

Monthly Average	Raw Water			Treated Water		
	Turbidity N.T.U.	pH	Temperature ° Celsius	pH	Temperature ° Celsius	Aluminum mg/L ECR Al
Jan.	0.348	8.16	3.8	7.54	4.9	0.067
Feb.	0.368	8.10	2.7	7.35	3.4	0.163
March	0.437	8.20	2.8	7.40	3.7	0.052
April	0.572	8.30	5.6	7.37	6.1	0.055
May	0.468	8.35	10.3	7.37	10.7	0.052
June	0.567	8.32	16.6	7.36	16.3	0.075
July	0.803	8.36	22.4	7.40	21.5	0.154
August	0.688	8.32	24.5	7.40	24.1	0.152
Sept.	0.766	8.33	23	7.40	22.9	0.145
Oct.	0.397	8.16	17.3	7.44	17.5	0.104
Nov.	0.215	8.18	10.7	7.49	11.3	0.080
Dec.	0.21	8.21	5.9	7.52	6.6	0.046