



2014 ANNUAL REPORT - FINAL

Drinking-Water System Number:	220001254
Drinking-Water System Name:	James W. King Water Treatment Plant
Drinking-Water System Owner:	Separated Town of Gananoque
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2014 to December 31, 2014

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 2,463 m<sup>3</sup> of water daily to the residents, businesses, and industries in Gananoque in 2014. 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:**

Water Tower safety upgrades, overcoating and logo \$312,691  
Secondary backwash pump engineering \$15,789  
SCADA Upgrades \$137,926  
Low Lift Pump #2 – Pump and Motor Rehab \$9312  
Fluoride Room converted to Shower/Laundry Facilities and New WTP Sign \$11,332T  
Two filter effluent turbidity meters installed \$8783  
Two new actuators installed \$11,272

*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
Raw	52	0 - 2	0 - >400	NA
Treated*	52	0 - 0	0 - 0	<10 - 30
Distribution*	224	0 - 0	0 - 10	<10 - 20

*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 #)
Turbidity(Filters)	8760	0.0 – 0.531 NTU
Chlorine(Treated)	8760	1.56 – 3.31 mg/l
Distribution Chlorine	504	0.33 – 3.58 mg/l

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

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

Parameter	Sample Date	Result Value	Unit of Measure	Limit
Antimony	Jan 14/14	0.0002	mg/L	0.006
Arsenic	Jan 14/14	0.0008	mg/L	0.025
Barium	Jan 14/14	0.023	mg/L	1.0
Boron	Jan 14/14	0.021	mg/L	5.0
Cadmium	Jan 14/14	<0.00002	mg/L	0.005
Chromium	Jan 14/14	<0.002	mg/L	0.05
*Lead (For Systems Testing Under Sch. 15.2)	Jan 14/14	0.00013	mg/L	0.01
Mercury	Jan 14/14	0.00024	mg/L	0.001
Selenium	Jan 14/14	0.002	mg/L	0.01
Sodium	Jan 14/14	13.4	mg/L	20
Uranium	Jan 14/14	0.00029	mg/L	0.02
Fluoride	Jan 14/14	0.2	mg/L	1.5
Nitrite	Oct 21/14	<0.1	mg/L	1.0
Nitrate	Oct 21/14	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>	16	<0.00002 - 0.00102	0	84 - 88
<b>Residential</b>	57	<0.00002 - 0.01350	1	Not tested
<b>Non-Residential</b>	8	<0.00002 - 0.02330	1	Not tested

Note: The Town of Gananoque met the sampling requirements for the sampling period ending April 15, 2014 but unfortunately did not meet the requirements for the sampling period ending on Oct. 15, 2014. On October 15, 2014 application was made to the Ministry of Environment for full relief of lead sampling. At this point the application for full relief is accepted in principal however; final wording of the license conditions has not yet been received.

*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 14/14	<0.3	ug/L	5
Aldicarb	Jan 14/14	<3	ug/L	9
Aldrin + Dieldrin	Jan 14/14	<0.02	ug/L	0.7
Atrazine + N-dealkylated metabolites	Jan 14/14	<0.5	ug/L	5
Azinphos-methyl	Jan 14/14	<1	ug/L	20
Bendiocarb	Jan 14/14	<3	ug/L	40
Benzene	Jan 14/14	<0.5	ug/L	5
Benzo(a)pyrene	Jan 14/14	<0.005	ug/L	0.01
Bromoxynil	Jan 14/14	<0.3	ug/L	5
Carbaryl	Jan 14/14	<3	ug/L	90
Carbofuran	Jan 14/14	<1	ug/L	90
Carbon Tetrachloride	Jan 14/14	<0.2	ug/L	5
Chlordane (Total)	Jan 14/14	<0.04	ug/L	7
Chlorpyrifos	Jan 14/14	<0.5	ug/L	90
Cyanazine	Jan 14/14	<0.5	ug/L	10
Diazinon	Jan 14/14	<1	ug/L	20
Dicamba	Jan 14/14	<5	ug/L	120
1,2-Dichlorobenzene	Jan 14/14	<0.1	ug/L	200
1,4-Dichlorobenzene	Jan 14/14	<0.2	ug/L	5
Dichlorodiphenyltrichloroethane (DDT) + metabolites	Jan 14/14	<0.01	ug/L	30
1,2-Dichloroethane	Jan 14/14	<0.1	ug/L	5
1,1-Dichloroethene (vinylidene chloride)	Jan 14/14	<0.1	ug/L	14
Dichloromethane	Jan 14/14	<0.3	ug/L	50
2-4 Dichlorophenol	Jan 14/14	<0.1	ug/L	900

<b>2,4-Dichlorophenoxy acetic acid (2,4-D)</b>	Jan 14/14	<b>&lt;5</b>	<b>ug/L</b>	<b>100</b>
<b>Diclofop-methyl</b>	Jan 14/14	<b>&lt;0.5</b>	<b>ug/L</b>	<b>9</b>
<b>Dimethoate</b>	Jan 14/14	<b>&lt;1</b>	<b>ug/L</b>	<b>20</b>
<b>Dinoseb</b>	Jan 14/14	<b>&lt;0.5</b>	<b>ug/L</b>	<b>10</b>
<b>Diquat</b>	Jan 14/14	<b>&lt;5</b>	<b>ug/L</b>	<b>70</b>
<b>Diuron</b>	Jan 14/14	<b>&lt;5</b>	<b>ug/L</b>	<b>150</b>
<b>Glyphosate</b>	Jan 14/14	<b>&lt;25</b>	<b>ug/L</b>	<b>280</b>
<b>Heptachlor + Heptachlor Epoxide</b>	Jan 14/14	<b>&lt;0.1</b>	<b>ug/L</b>	<b>3</b>
<b>Lindane (Total)</b>	Jan 14/14	<b>&lt;0.1</b>	<b>ug/L</b>	<b>4</b>
<b>Malathion</b>	Jan 14/14	<b>&lt;5</b>	<b>ug/L</b>	<b>190</b>
<b>Methoxychlor</b>	Jan 14/14	<b>&lt;0.1</b>	<b>ug/L</b>	<b>900</b>
<b>Metolachlor</b>	Jan 14/14	<b>&lt;3</b>	<b>ug/L</b>	<b>50</b>
<b>Metribuzin</b>	Jan 14/14	<b>&lt;3</b>	<b>ug/L</b>	<b>80</b>
<b>Monochlorobenzene</b>	Jan 14/14	<b>&lt;0.2</b>	<b>ug/L</b>	<b>80</b>
<b>Paraquat</b>	Jan 14/14	<b>&lt;1</b>	<b>ug/L</b>	<b>10</b>
<b>Parathion</b>	Jan 14/14	<b>&lt;3</b>	<b>ug/L</b>	<b>50</b>
<b>Pentachlorophenol</b>	Jan 14/14	<b>&lt;0.1</b>	<b>ug/L</b>	<b>60</b>
<b>Phorate</b>	Jan 14/14	<b>&lt;0.3</b>	<b>ug/L</b>	<b>2</b>
<b>Picloram</b>	Jan 14/14	<b>&lt;5</b>	<b>ug/L</b>	<b>190</b>
<b>Polychlorinated Biphenyls(PCB)</b>	Jan 14/14	<b>&lt;0.05</b>	<b>ug/L</b>	<b>3</b>
<b>Prometryne</b>	Jan 14/14	<b>&lt;0.1</b>	<b>ug/L</b>	<b>1</b>
<b>Simazine</b>	Jan 14/14	<b>&lt;0.5</b>	<b>ug/L</b>	<b>10</b>
<b>THM (NOTE: show latest annual average)</b>	Jan. 14 , April 8, July 22 , Oct. 21/14	<b>42.2</b>	<b>ug/L</b>	<b>100</b>
<b>Temephos</b>	Jan 14/14	<b>&lt;10</b>	<b>ug/L</b>	<b>280</b>
<b>Terbufos</b>	Jan 14/14	<b>&lt;0.3</b>	<b>ug/L</b>	<b>1</b>
<b>Tetrachloroethylene</b>	Jan 14/14	<b>&lt;0.2</b>	<b>ug/L</b>	<b>30</b>
<b>2,3,4,6-Tetrachlorophenol</b>	Jan 14/14	<b>&lt;0.1</b>	<b>ug/L</b>	<b>100</b>
<b>Triallate</b>	Jan 14/14	<b>&lt;10</b>	<b>ug/L</b>	<b>230</b>
<b>Trichloroethylene</b>	Jan 14/14	<b>&lt;0.1</b>	<b>ug/L</b>	<b>5</b>
<b>2,4,6-Trichlorophenol</b>	Jan 14/14	<b>&lt;0.1</b>	<b>ug/L</b>	<b>5</b>
<b>2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)</b>	Jan 14/14	<b>&lt;10</b>	<b>ug/L</b>	<b>280</b>
<b>Trifluralin</b>	Jan 14/14	<b>&lt;0.5</b>	<b>ug/L</b>	<b>45</b>
<b>Vinyl Chloride</b>	Jan 14/14	<b>&lt;0.2</b>	<b>ug/L</b>	<b>2</b>

## **2014 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.	0.213	8.08	3.2	7.51	3.2	0.090
Feb.	0.200	8.00	2.7	7.52	2.4	0.073
March	0.167	8.07	2.7	7.54	2.8	0.099
April	0.419	8.25	5.7	7.49	4.6	0.062
May	0.418	8.14	13.6	7.40	10.1	0.076
June	0.354	8.25	18.2	7.55	14.7	0.122
July	0.516	8.20	20.7	7.52	19.3	0.161
August	0.661	8.37	23.6	7.52	21.6	0.148
Sept.	0.516	8.40	21.5	7.54	20.4	0.126
Oct.	0.382	8.22	17.4	7.59	16.6	0.099
Nov.	0.331	8.14	11.3	7.62	10.7	0.064
Dec.	0.267	8.16	6.3	7.56	5.5	0.050