



**Ontario Clean Water Agency  
Agence Ontarienne Des Eaux**

## **WIARTON WATER TREATMENT**

Large Municipal Residential Drinking Water System

### **SCHEDULE 22 SUMMARY REPORT**

**For the period of  
JANUARY 1, 2015 TO DECEMBER 31, 2015**

Prepared by the Ontario Clean Water Agency  
For The Corporation of the Town of South Bruce Peninsula

## Summary

This report is a summary of water quality and quantity information submitted in accordance with Schedule 22 of Ontario's Drinking Water System Regulation for the reporting period of January 1, 2015 to December 31, 2015 for the Wiarton Drinking Water System located in the Town of South Bruce Peninsula. The summary includes the following information:

- Any requirements of the Act and Regulation, Orders or System Approval(s) that the system failed to meet during the reporting period and the measures taken to correct each failure.
- A summary of the quantities and flow rates of water supplied during the reporting period, including monthly averages and maximum daily flows.
- A comparison of the average and monthly maximum daily flows to the approved capacity specified in the System Approval.

## Issues of Non-Compliance

The following lists the requirements of the Act, Regulations, System Approval(s) and any Order that the system failed to meet during the reporting period and the measures taken to correct each failure:

- No actions are required.

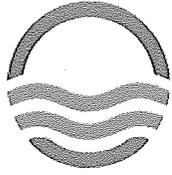
An MOECC Drinking Water System Inspection was performed on January 20, 2015. On February 13, 2015 the report for this inspection was issued, the Wiarton Drinking Water System received an inspection rating of 100%, and no non-compliances were issued.

## Assessment of Flowrates and Quantity of Water Supplied

The quantities and flowrates of water supplied during the reporting period covered by this report, including monthly average and maximum flowrates, flows and a comparison to the rated capacity can be found in Table 1. The rated capacity for the Wiarton WTP is 5400 m<sup>3</sup>/day as per the Municipal Drinking Water License. Average and maximum flows and flowrates for treated water are shown in Table 1 and were used to compare to the rated capacity of the plant.

**Table 1.** Average and Maximum Flowrate, Flow and Comparison to Rated Capacity by Month for 2015 for Treated Water

2015	Treated Water Flow				Treated Water Flowrate	
	Average Flow (m <sup>3</sup> /day)	Percent of Rated Capacity	Maximum Flow (m <sup>3</sup> /day)	Percent of Rated Capacity	Average Flowrate (l/s)	Maximum Flowrate (l/s)
January	847.51	16%	1128.25	21%	68.16	77.10
February	965.32	18%	1654.44	31%	68.24	76.89
March	1505.38	28%	1869.65	35%	68.37	78.07
April	1217.89	23%	1855.43	34%	68.20	78.65
May	949.68	18%	1190.46	22%	67.81	92.59
June	1005.99	19%	1860.73	34%	67.69	78.72
July	1174.23	22%	1599.61	30%	67.60	78.82
August	1136.60	21%	1804.98	33%	67.13	78.07
September	1065.09	20%	1503.64	28%	67.08	77.42
October	1092.05	20%	1562.15	29%	66.83	79.44
November	911.35	17%	1567.68	29%	66.64	76.46
December	889.79	16%	1232.67	23%	64.03	75.92



**Ontario Clean Water Agency  
Agence Ontarienne Des Eaux**

## **WIARTON TREATMENT SYSTEM**

Large Municipal Residential Drinking Water System

### **SECTION 11 ANNUAL REPORT**

**For the period of  
JANUARY 1, 2015 TO DECEMBER 31, 2015**

Prepared by the Ontario Clean Water Agency  
For The Town of South Bruce Peninsula

<b>Drinking Water System Number:</b>	220002681
<b>Drinking Water System Name:</b>	Warton Water Treatment Plant
<b>Drinking Water System Owner:</b>	Town of South Bruce Peninsula
<b>Drinking Water System Category:</b>	Large Municipal Residential
<b>Reporting Period:</b>	January 1, 2015 to December 31, 2015

**Does the Drinking Water System serve more than 10,000 people?**

No.

**Is your annual report available to the public at no charge on a web site on the Internet?**

Yes.

**Location where the Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection:**

Town of South Bruce Peninsula  
 315 George Street  
 Wiarton, Ontario  
 N0H 2T0

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

- Oxenden Distribution System (260004215)
- Oliphant Drinking Water System (220007695)

**Did you provide a copy of the annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?**

Yes

**How system users are notified that the 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: \_\_\_\_\_

**Description of Drinking Water System:**

The Wiarton Drinking Water System is a Class III Treatment and Class II Distribution System.

There are two raw water intakes, a main intake, and back-up intake. The main raw water polyethylene intake pipe, 450 mm in diameter, is approximately 180 m long, east of water treatment plant. It is located in Colpoy's Bay (Georgian Bay) with an intake structure composed of cement jute bags and steel gabions. The backup raw water 450 mm diameter polyethylene intake pipe, approximately 45 m long, east of water treatment plant, is also located in Colpoy's Bay (Georgian Bay), with an intake structure composed of cement jute bags and steel gabions. Both intakes are an approximate depth of 8 meters.

Two polyethylene lines, each 3/4 -inch diameter, are used to supply sodium hypochlorite to the intake diffuser for zebra mussel control. These lines are located within the intake pipes extending from the water treatment plant to the intake structures, one line for each intake.

A polyethylene line, also located within each of the intake pipes, is used to supply a raw water sample

(prior to chlorination for zebra mussel control) to the laboratory for testing purposes.

A raw water pumping station equipped with four 31.3 L/s pumps at 9.8 m total dynamic head (TDH) are used to draw water from a two-cell raw water well. Two (2) pumps usually run at any given time. Within the raw water well, a traveling screen is installed rated at a capacity of 9.391 m<sup>3</sup>/d and one bar screen (used as a standby).

Two high lift pumps each rated at 59.5 L/s at 77.7 TDH (one duty, one standby), are used to provide water to the distribution system and standpipe. Each pump is connected to a common header with one flow meter.

The water treatment plant building is approximately 26.7 m by 18.2 m and contains the low lift and high lift pumping stations, flocculation tanks, filters, chemical storage and pumping devices, standby diesel generator, office, laboratory, control and instrumentation equipment, washroom and utility rooms. The CofA specifies a rated treatment capacity not to exceed 62.3 L/s (allows for the production of 5,400 cubic meters per day if running continuously).

PAX – XL1900 is added and mixed in an in-line mechanical mixer on the raw water line. It is rated at a capacity of 5,400 m<sup>3</sup>/d.

There are two flocculation tanks each with a total volume of approximately 104 m<sup>3</sup>, designed to provide hydraulic mixing for flocculation. There are no clarifiers used in the treatment process.

Two direct filtration, dual-media, gravity filters each rated at 2,700 cubic meters per day (31.2 litres per second) and each having a total surface area of approximately 13.5 m<sup>2</sup>, are used to filter the floc. Anthracite and sand are the media used. The rated capacity of the plant is based on the design filtration rate of the filters (8.35 cubic meters of water per square meter of media per hour).

Each filter is equipped with a 156 L/s filter backwash pump, an agitator and an underdrain system. Each filtered water line has an online turbidimeter meter. The filtrate is chlorinated again prior to the water entering the clearwell.

Filter-to-waste piping connects to the filter effluent piping of both filters and allows filtered water back to discharge to the raw water well during filter ripening.

There is one un-baffled clearwell divided into two compartments (Cell No 1, 484 m<sup>3</sup> and Cell No 2, 267 m<sup>3</sup>) with a total useable water storage volume of approximately 751 m<sup>3</sup>.

A sodium hypochlorite disinfection system provided both primary and secondary disinfection. It consists of four metering pumps each rated at 6 L/hr feed 12% sodium hypochlorite to four injection points; 1) marine intake, crib for zebra mussel control (Pump NO 1), 2) low lift pump well for pre-chlorination (Pump No 2), 3) filter effluent pipes for post chlorination (Pump No 3), and 4) high lift pump header for chlorine residual control (Pump No 4). The sodium hypochlorite storage tank has a capacity of 20,543 L, and normally filled to around 5,000 L at any given time. The free chlorine residual in the treated water leaving the plant provided a method for secondary disinfection.

An activated carbon feed system for taste and odour control is installed and consists of a prefabricated package unit comprised of a feed hopper, bag loader, volumetric feeder, solution tank and explosion proof control panel and instrumentation, two metering pumps (one duty, one standby) and a chemical feed line to the in-line mixer. To date, the activated carbon system has not been used.

A coagulant feed system for enhancing flocculation is installed and consists of a 11,360 L capacity storage tank equipped with one metering pump, capable of pumping approximately 6 L/hr.

A sodium bisulphate feed system is installed and consists of a storage tank equipped with two metering pumps rated at 14L/hr, one feeding to the in-line mixer ahead of the flocculation tanks or to the raw water well either for de-chlorination or pH correction, the other one feeding to the surge tank ahead of the wastewater sedimentation tank for de-chlorination.

A manual polymer system is used for enhancing settling in the wastewater sedimentation tank. Two backwash wastewater surge tanks are used to initially collect the suspended solids that originated on the turbidity filters. Each tank has a total volume of approximately 256 m<sup>3</sup> and equipped with three submersible mixers and two transfer pumps that discharge to the in-line blender ahead of the wastewater sedimentation tank. A filter backwash wastewater sedimentation tank is also used and has a total volume of approximately 86 m<sup>3</sup>. Two sludge withdrawal pumps are used to discharge the sediment to the local sanitary sewer and a supernatant decant pipe work discharges to Colpoy's Bay after being de-chlorinated in the sedimentation tank.

A 225 kW diesel generator set (Kohler Poser Systems Model 250ROZD91), in a separate room of the water treatment plant building is used to provide emergency standby power to operate the entire plant. It has two 1,110 L fuel tanks, each joined together through a common supply line and capable of providing an estimated 26 hours of continuous operation (assuming a diesel consumption rate of 85 L/hour at 100% output) if the tanks are full.

Monitoring equipment (SCADA) includes on-line turbidity and chlorine analyzers, raw water flow meter, two filter effluent flow meters, finished water flow meter, filter wash water flow meter, and wash water turbidity analyzer.

Auto dialer equipment is linked to alarm outputs from the monitoring of the clear well high/low level, flocculated water conduit, overflow, filter over flow, low filters, flocculation tanks overflow, raw water high/low level chlorine residual, intrusion alarm, high building temperature, smoke alarms, building flood, low diesel fuel tank level and diesel failure.

The booster station consists of one floor and encompasses all the works including a 7.5 hp duty pump and three 25 hp fire pumps. The booster station has a rated capacity of 2,724 L per minute. A diesel generator is installed in the booster station facility. It has a power rating of 80 kW and is capable of keeping the booster station operating during power outages.

The booster station services a pressure zone in the area of Gould St., Daniel St., and Jenny St. Homes at an elevation higher than approximately 212 meters above sea level are served by the booster station.

An elevated storage tank with a capacity of 2,895 m<sup>3</sup> (637,000 Imperial Gallons) is located on Gould Street adjacent to the booster station.

Two ultraviolet (UV) disinfection reactors (Trojan UV Swift) are also used to provide primary disinfection at the plant. They are located on the high lift discharge header, each unit designed to provide a minimum pass through UV dose of 40 mJ/cm<sup>2</sup> at a minimum UV transmittance (UVT) of 90% and at a maximum flow rate of 87.4 L/s. Reactors are manually switched between duty and stand-by and only one unit operated at any given time.

The main plant programmable logic controller is electronically connected to each of the two UV units for communication purposes. Under normal automatic operation, water is not pumped from the plant unless

the duty UV unit is on and operational (dose is greater than 40 mJ/cm<sup>2</sup>, UVT is greater than or equal to 90%). During plant start-up, the programmable logic controller signals the duty UV unit to warm up, and the warm up sequence takes about three minutes. Once the warm up sequence is complete, a high lift pump starts and water is pumped from the clear well through the duty UV unit out to the distribution system. The duty UV light continues to operate as long as the high lift pump is running.

During plant shutdown, the programmable logic controller stops the high lift pump, and once it is stopped, the duty UV unit is signaled to shut down. The UV shut down sequence involves cooling of the UV lamps and takes about three minutes.

In situations where the duty UV unit fails during start-up, the high lift pump will not start. If the duty UV unit fails during normal operations or shutdown, the programmable logic controller signals the high lift pumps to stop and the UV unit cooling sequence is automatically initiated. The valve isolating the distribution system closes after about 30 seconds, the time required for the high lift pump to shut down. During this 30-second interval, the UV intensity and dosage from the duty UV unit is still high enough for adequate disinfection.

The Wiarton distribution system has approximately 1062 service connections and serves an estimated population of 2,300 residents. There are approximately 23.5 kilometers of water mains and approximately 87 fire hydrants. The system currently comprises of approximately 54% PVC piping and 46% cast iron and ductile iron (tougher than cast iron). Four thousand to five thousand meters of cast iron piping are reportedly still present.

The Wiarton Water Treatment Plant also serves the Oxenden Distribution System to the east of the Town of Wiarton. This distribution system is owned by the Township of Georgian Bluffs. It currently serves a residential area consisting of seasonal and permanent homes with 171 service connections and 23 vacant lots with an estimated population of less than 500 consumers.

The Wiarton Water Treatment Plant also provides drinking water to the Oliphant Drinking Water System which serves an estimated population of 225 residents.

**List of water treatment chemicals used during the reporting period:**

- Sodium Hypochlorite 12%
- PAX-XL1900 Coagulation
- LIPQIPAM A-307PG Flocculation
- Sodium Metabisulfite

**Significant expenses were incurred to:**

- Install required equipment
- Repair required equipment
- Replace required equipment
- No significant expenses were incurred

**Description of expenses:**

n/a.

**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:**

Date of Incident	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
December 31, 2015	Total Coliforms	320	cfu/ 100 mL	Re-sampled (upstream, at the site and downstream). When resampling the tap was flushed for 30 minutes prior to sampling. Samples were tested for E. coli and total coliforms. Results came back with 0 cfu/100 mL for e.coli and total coliform.	January 6, 2016

**Table 1. 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		Range of Total Coliforms Results		Number of HPC Samples	Range of HPC Samples	
		Minimum	Maximum	Minimum	Maximum		Minimum	Maximum
Raw (RW)	52	0	4	0	200	n/a	n/a	n/a
Treated (TW)	52	0	0	0	0	52	0	3
Distribution (DW)	162	0	0	0	320	53	0	9

**Table 2. Operational testing done under Schedule 7, 8 or 9 during the period covered by this Annual Report.**

	Number of Grab Samples	Range of Results	
		Minimum	Maximum
Turbidity, On-Line (NTU) - Filt1	8760	0	0.43
Turbidity, On-Line (NTU) - Filt2	8760	0	0.22
Free Chlorine Residual, On-Line (mg/L) - TW	8760	0.86	1.56
Free Chlorine Residual, In-House (mg/L) - DW	728	0.52	1.38

NOTE: Record the unit of measure if it is not milligrams per litre.

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

**Table 3. Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.**

Date of Order of MDWL	Parameter	Date Sampled	Result	MDWL Allowable Annual Average Concentration
March 19, 2015 094-102 (Issue 2)	Total Suspended Solids (Filter backwash - composite)	January 19, 2015 March 30, 2015 April 7, 2015 July 7, 2015 October 5, 2015	8.6 mg/L	25 mg/L

NOTE: Quarterly samples are required as per MDWL 094-102, Issue 2.

**Table 4. Summary of Inorganic parameters tested during this reporting period or most recent sample results**

Parameter	Sample Date (mm/dd/yyyy)	Sample Result	Exceedance
Antimony: Sb (ug/L) - TW	1/6/2015	0.1	No
Arsenic: As (ug/L) - TW	1/6/2015	0.3	No
Barium: Ba (ug/L) - TW	1/6/2015	12.8	No
Boron: B (ug/L) - TW	1/6/2015	15.7	No
Cadmium: Cd (ug/L) - TW	1/6/2015	<MDL 0.003	No
Chromium: Cr (ug/L) - TW	1/6/2015	<MDL 0.03	No
Mercury: Hg (ug/L) - TW	1/6/2015	0.02	No
Selenium: Se (ug/L) - TW	1/6/2015	<MDL 1.0	No
Uranium: U (ug/L) - TW	1/6/2015	0.04	No
Fluoride (mg/L) - TW	1/7/2013	0.08	No
Nitrite (mg/L) - TW	3/23/2015	<MDL 0.003	No
Nitrite (mg/L) - TW	4/7/2015	<MDL 0.003	No
Nitrite (mg/L) - TW	7/6/2015	<MDL 0.003	No
Nitrite (mg/L) - TW	10/5/2015	<MDL 0.003	No
Nitrate (mg/L) - TW	3/23/2015	0.264	No
Nitrate (mg/L) - TW	4/7/2015	0.261	No
Nitrate (mg/L) - TW	7/6/2015	0.216	No
Nitrate (mg/L) - TW	10/5/2015	0.22	No
Sodium: Na (mg/L) - TW	1/7/2013	6.46	No

NOTE: 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.

NOTE: Fluoride and Sodium are to be sampled every 60 months. The most current samples for Sodium were taken on January 7, 2013. The next set of Sodium samples are to be taken in January 2018. The most current samples for Fluoride were taken on January 7, 2013. The next set of Fluoride samples are to be taken in January 2018.

**Table 5. Summary of lead testing under Schedule 15.1 during this reporting period.**

Location Type	Number of Samples	Range of Lead Results		Number of Exceedances
		Minimum	Maximum	
Plumbing	n/a	n/a	n/a	n/a
Distribution (ug/L)	4	0.15	0.76	0

NOTE: This system now qualifies for the plumbing exemption as per Ontario Regulation 170/03 Schedule 15.1-5 (9) (10). Four (4) distribution lead samples are only taken every 36 months. (i.e. 2 samples per period). The most current set of samples was taken in 2015. The next set of lead samples will be taken in 2018.

**Table 6. Summary of Organic parameters sampled during this reporting period or most recent sample results.**

Parameter	Sample Date	Result Value	Exceedance
Alachlor (ug/L) - TW	1/6/2015	<MDL 0.02	No
Aldicarb (ug/L) - TW	1/6/2015	<MDL 0.01	No
Aldrin+Dieldrin (ug/L) - TW	1/6/2015	<MDL 0.01	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	1/6/2015	0.010	No
Azinphos-methyl (ug/L) - TW	1/6/2015	<MDL 0.02	No
Bendiocarb (ug/L) - TW	1/6/2015	<MDL 0.01	No
Benzene (ug/L) - TW	1/6/2015	<MDL 0.32	No
Benzo(a)pyrene (ug/L) - TW	1/6/2015	<MDL 0.004	No
Bromoxynil (ug/L) - TW	1/6/2015	<MDL 0.33	No
Carbaryl (ug/L) - TW	1/6/2015	<MDL 0.01	No
Carbofuran (ug/L) - TW	1/6/2015	<MDL 0.01	No
Carbon Tetrachloride (ug/L) - TW	1/6/2015	<MDL 0.16	No
Chlordane: Total (ug/L) - TW	1/6/2015	<MDL 0.01	No
Chlorpyrifos (ug/L) - TW	1/6/2015	<MDL 0.02	No
Cyanazine (ug/L) - TW	1/6/2015	<MDL 0.03	No
Diazinon (ug/L) - TW	1/6/2015	<MDL 0.02	No

Parameter	Sample Date	Result Value	Exceedance
Dicamba (ug/L) - TW	1/6/2015	<MDL 0.2	No
1,2-Dichlorobenzene (ug/L) - TW	1/6/2015	<MDL 0.41	No
1,4-Dichlorobenzene (ug/L) - TW	1/6/2015	<MDL 0.36	No
DDT + metabolites (ug/L) - TW	1/6/2015	<MDL 0.01	No
1,2-Dichloroethane (ug/L) - TW	1/6/2015	<MDL 0.35	No
1,1-Dichloroethylene (ug/L) - TW	1/6/2015	<MDL 0.33	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	1/6/2015	<MDL 0.35	No
2,4-Dichlorophenol (ug/L) - TW	1/6/2015	<MDL 0.15	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	1/6/2015	<MDL 0.19	No
Diclofop-methyl (ug/L) - TW	1/6/2015	<MDL 0.4	No
Dimethoate (ug/L) - TW	1/6/2015	<MDL 0.03	No
Dinoseb (ug/L) - TW	1/6/2015	<MDL 0.36	No
Diquat (ug/L) - TW	1/6/2015	<MDL 1.0	No
Diuron (ug/L) - TW	1/6/2015	<MDL 0.03	No
Glyphosate (ug/L) - TW	1/6/2015	<MDL 1.0	No
Heptachlor+hepachlor epoxide (ug/L) - TW	1/6/2015	<MDL 0.01	No
Lindane (ug/L) - TW	1/6/2015	<MDL 0.01	No
Malathion (ug/L) - TW	1/6/2015	<MDL 0.02	No
Methoxychlor (ug/L) - TW	1/6/2015	<MDL 0.01	No
Metolachlor (ug/L) - TW	1/6/2015	<MDL 0.01	No
Metribuzin (ug/L) - TW	1/6/2015	<MDL 0.02	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	1/6/2015	<MDL 0.3	No
Paraquat (ug/L) - TW	1/6/2015	<MDL 1.0	No
Parathion (ug/L) - TW	1/6/2015	<MDL 0.02	No
PCB (ug/L) - TW	1/6/2015	<MDL 0.04	No
Pentachlorophenol (ug/L) - TW	1/6/2015	<MDL 0.15	No
Phorate (ug/L) - TW	1/6/2015	<MDL 0.01	No
Picloram (ug/L) - TW	1/6/2015	<MDL 1.0	No
Prometryne (ug/L) - TW	1/6/2015	<MDL 0.03	No
Simazine (ug/L) - TW	1/6/2015	<MDL 0.01	No
Temephos (ug/L) - TW	1/6/2015	<MDL 0.01	No
Terbufos (ug/L) - TW	1/6/2015	<MDL 0.01	No
Tetrachloroethylene (ug/L) - TW	1/6/2015	<MDL 0.35	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	1/6/2015	<MDL 0.2	No
Triallate (ug/L) - TW	1/6/2015	<MDL 0.01	No
Trichloroethylene (ug/L) - TW	1/6/2015	<MDL 0.44	No
2,4,6-Trichlorophenol (ug/L) - TW	1/6/2015	<MDL 0.25	No
2,4,5-T (ug/L) - TW	1/6/2015	<MDL 0.22	No
Trifluralin (ug/L) - TW	1/6/2015	<MDL 0.02	No
Vinyl Chloride (ug/L) - TW	1/6/2015	<MDL 0.17	No
Trihalomethane: Total (ug/L) Annual Average - DW	2015 (Quarterly)	28	No

\*Annual average of THMs

**Table 7. 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

NOTE: This is required only if DWS category is large municipal residential, small municipal residential, large municipal non-residential, small municipal non-residential, large non municipal non-residential)