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**NORTH  
GLENGARRY  
NORD**

*Ontario's Celtic Heartland  
Le centre celtique de l'Ontario*

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# **The Township of North Glengarry**

## **Alexandria Drinking Water System**

### **2017 Annual and Summary Report**

In compliance with O. Reg 170/03, section 11 and O. Reg 170/03 schedule 22

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## Section 1: Introduction

This report is an annual summary of water quantity, quality system information, system operations and major expenditures for the Alexandria Water Treatment plant and distribution system during the reporting period of January 1, 2017 to December 31, 2017. It was prepared in accordance with section 11 and schedule 22 of the of Ontario's Drinking Water Systems Regulation O. Regulation 170/03.

## Section 2: System Description

The Alexandria Water Treatment Plant is located on Gernish St West within the town of Alexandria. This system uses surface water, from the Mill Pond, as its source to supply the residents with treated water and has a rated capacity of 8014m<sup>3</sup>/day. It is categorized as a large municipal residential drinking water system.

## Section 3: Process and Equipment Description

### Raw Water Intake

Located in Mill Pond, approximately 425m southwest of the water treatment plant, the intake is comprised of a precast concrete pipe, 1.5m diameter and 760mm high, placed on top of a concrete slab housed in a 2.4m by 2.4m timber crib with screening.

A 350mm concrete pipe runs from the intake, east through the Island Park to Park Avenue, then north up Park Avenue before turning east into the water plant, where it enters the low lift chamber.

The flows from Mill Pond to the water plant are based on gravity, and therefore are heavily influenced by water depth in the Mill Pond. In the event levels begin to reduce the Township will communicate with the Raisin River Conservation Authority to ensure levels will be sufficient to supply the raw water demands, which can be achieved through river damming system in place.

### Low Lift Chamber/Raw Water Well

The chamber/well is 4.7m by 1.5m by 4.0m and located in the southwest corner of the water treatment plant. There are two coarse screens, openings approximately 6.45m<sup>2</sup>, located between the raw well entry and the low lift chamber to provide a coarse screening prior to pumping.

The low lift pumps consist of two 14.9kW vertical turbine pumps, rated at 6,200m<sup>3</sup>/day at 14.6m total dynamic head (TDH). Each pump is equipped with auto, manual and stop capability through the SCADA control system and at the electrical panel. A flow meter and electric valve are used to control flows from the pumps, the valve will modulate based on flocculation tank levels. At any time if the flows are near the Permit to Take Water (PTTW) restrictions, the valve can be manually operated to ensure the levels are not exceeded.

Chemicals added to the raw well include activated carbon and potassium permanganate. The activated carbon is typically added during warmer water temperatures to aid taste and odour treatment. The potassium permanganate is typically added during colder water temperatures and aids to oxidize manganese, which generally only begins to increase after ice cover of the Mill Pond.

### Coagulation/Flocculation/Sedimentation

A coagulant and polymer feed systems are in place at the water treatment plant, with the coagulant feed entering just prior to an in-line mixer after the low lift pumps. The polymer feed is located just prior to the inlet for the first flocculation tank. All flows after the first flocculation tank are based on gravity.

After chemical addition water enters 2 flocculation chambers operated in series, each measuring 2.6m by 4.6m, and each chamber is equipped with a 0.37kW, 5 rpm agitator for slow and gentle mixing. A depth measurement is taken at the end of the second flocculation tank and this measurement is used to control the flows from the low lift pumps.

After chemical addition and flocculation, the water is directed into a conduit channel directing water to the sediment tanks.

The sediment tanks are comprised of 4 concrete tanks, operated in parallel and each measuring 11.7m by 3.6m by 4.9m. Each tank is baffled by a 4.7m by 2.7m wall located roughly 5.6m from the inlet and on the far side of the wall, tube settlers with a cross sectional area of 3.6m by 6.1m, are used to aid in the settling process. On the bottom of each tank contains sludge hoppers and drain pipes. The program is run through the SCADA system and sludge is removed based on amount of water treated and this can be adjusted as required.

### Filtration

The filtration system consists of four filters measuring 3.9m by 2.9m by 2.8m, which operate in parallel. Each filter has the capability of filtering a maximum flow of 2003m<sup>3</sup>/day; has a surface area of 11.3m<sup>2</sup>; is a mixed media, GAC and sand or anthracite and sand; contains a surface wash system; and is completed by an underdrain system. The filter is also equipped with loss or head monitoring and turbidity monitoring, both of which is used in determining when the filter is to be cleaned.

The backwash system is comprised of 2 pumps, a duty and standby, and all associated piping and valves. The duty pump is rated at 114L/sec at 9.2m TDH, where the standby is rates at 120L/sec at 10.2 TDH. All effluent water is directed to the sludge holding tank, where the supernatant is directed to the sanitary sewer.

### Disinfection

The disinfection system uses chlorine gas, which is injected into the header pipe prior to entering the clearwell. The clearwell is divided into 2 wells (east and west) and each well contains and smaller cell within them, labelled 1-4. The wells are interconnected by valves through piping or sluice gate opening. Influent water enters clearwell 4 and travels towards clearwell 1 before being discharged to the distribution, which allows for the appropriate contact time required.

The actual chlorination system consists of three chlorinators, each having the capacity of 22.7kg/day, and are equipped with two vacuum regulators and four chlorine cylinders at use at any one time.

A chloramination system was commissioned on December 20, 2011. As the water leaves the plant, it is dosed with ammonia to create combined chlorine residuals. This enables a longer lasting chlorine residual out in the distribution and the potential for decrease in THM production.

### High Lift Pumps

Three vertical turbine pumps are used to move the water from the clearwell to the distribution piping. The pumps are operated in duty and standby, with No. 1 and No. 3 located in clearwell

1; and No. 2 located in clearwell 4. Pump No. 2 is not to be run unless in an emergency situation or if all the disinfection requirements are met, as per the Disinfection Procedure.

**Distribution**

The distribution system is compromised of varying sized water pipes, valves, and fire hydrants. The current system is located within the town boundaries of Alexandria. It is considered a class 2 distribution and services approximately 1500 services.

**Automated Monitoring and Control**

A fully automated SCADA system was installed in the plant in 2011. This system is capable of monitoring, controlling and recording all the plant processes and data, such as flows, chlorine residual and turbidity readings. The system is also fully alarmed with multiple alarm set points, so that if any parameter is exceeded an alarm will be triggered on the SCADA desk top and through the auto dialer system. The on-call operator is then notified by the monitoring centre, which operates 24 hours a day, 365 days a year.

**Emergency Power**

A 175kW diesel powered generator, which is capable of operating the water treatment plant and the Township of North Glengarry office building at full capacity. The automatic transfer switch for this unit is located on the first floor within the water treatment plant.

**Additional Equipment.**

All piping, valves, controls and appurtenances along with associated mechanical and electrical equipment not mentioned in the description, but are utilized to make up the system.

**Section 4: Flow Summary**

In order to assess the rated capacity of the WTP in terms of meeting existing and planned uses of the system, a summary of the treated flow rates of water supplied during this period covered by this report was prepared and is presented below. In accordance with License #181-101, the Alexandria Drinking Water System shall not be operated to exceed the rated capacity of the treatment system. The permit to take water allows for a maximum daily raw flow of 5,616 m<sup>3</sup>/day and the water works license allows for a maximum treated water flow of 8,014m<sup>3</sup>.

The average treated daily flow for 2017 is calculated to be 1,799 m<sup>3</sup> and the maximum treated daily flow for the year was reported to be 2,792 m<sup>3</sup>. This represents 22.4% of the total plant rated capacity. Refer to the appendices for full 2017 data summary

<b>2017 Treated Flow Summary</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
Maximum Daily Flow (m <sup>3</sup> )	2,107	2,217	1,980	2,037	2,565	2,491	2,649	2,792	2,712	2,033	2,043	2,175
Monthly Average Flow (m <sup>3</sup> )	1,584	1,602	1,572	1,631	1,901	2,063	2,119	2,087	2,119	1,600	1,660	1,651
Monthly Average Daily Maximum Instantaneous Flow (L/s)	0.043	0.044	0.044	0.046	0.043	0.044	0.043	0.044	0.044	0.044	0.043	0.044
Rated Maximum Daily Flow for the approved system										8014 m <sup>3</sup> /day		
Rated Maximum Instantaneous Flow										0.093 L/s		

**Section 5: Sampling and Laboratory Analysis Summary**

The Township of North Glengarry uses Cadouceon Laboratories as the primary provider for all sample analysis. Cadouceon Laboratories is an accredited laboratory under the Ministry of the Environment and Climate Control requirements. Refer to table below for all results as required.

<b>2017 Microbiological Testing Completed as per Schedule 10, 11 and/or 12 of O. Reg 170/03</b>					
<i>Location</i>	<i>Number of Samples</i>	<i>Range of E. Coli or Fecal Results (#-#)</i>	<i>Range of Total Coliform Results (#-#)</i>	<i>Number of HPC Samples</i>	<i>Range of HPC Results (#-#)</i>
Raw	52	0 - 89	4 - 940	0	
Treated	52	0 - 0	0 - 0	52	< 2 - 20
Distribution	170	0 - 0	0 - 0	105	< 2 - 22

<b>2017 Operational Testing as per Schedule 7, 8 and or 9 of O. Reg 170/03</b>		
<i>Parameter</i>	<i>Number of Grab Samples</i>	<i>Range of Results unit of measure is mg/L unless otherwise indicated (#-#)</i>
Turbidity	247	0.31 ntu – 8.63 ntu
Chlorine	418	0.28 – 2.79
Fluoride <i>(If the DWS provides fluoridation)</i>		n/a

<b>Additional Sampling or Testing in Accordance with System Approval Requirement or Order</b>				
<i>Date of Order or Approval Amendment</i>	<i>Parameter</i>	<i>Date Sampled</i>	<i>Result</i>	<i>Unit of Measure</i>
n/a				

<b>2017 Summary of Inorganic Parameters Tested</b>					
<i>Annual sampling or most recent result (1ppm = 1mg/L)</i>					
<i>Parameter</i>	<i>Sample Date</i>	<i>Standard (maximum concentration)</i>	<i>Result Value</i>	<i>Unit of Measure</i>	<i>Exceedance</i>
<i>Antimony</i>	June 19, 2017	0.006 mg/L	< 0.0001	mg/L	No
<i>Arsenic</i>	June 19, 2017	0.01 mg/L	0.0003	mg/L	No
<i>Barium</i>	June 19, 2017	1.0 mg/L	0.011	mg/L	No
<i>Boron</i>	June 19, 2017	5.0 mg/L	0.006	mg/L	No
<i>Cadmium</i>	June 19, 2017	0.005 mg/L	< 0.000014	mg/L	No
<i>Chromium</i>	June 19, 2017	0.05 mg/L	< 0.002	mg/L	No
<i>Lead</i>	September 14, 2017	0.01mg/L	0.00045	mg/L	No
<i>Mercury</i>	June 19, 2017	0.001mg/L	0.00003	mg/L	No
<i>Selenium</i>	June 19, 2017	0.01 mg/L	< 0.001	mg/L	No
<i>Uranium</i>	June 19, 2017	0.02 mg/L	< 0.00005	mg/L	No
<i>Fluoride</i>	July 11, 2017	1.5 mg/L	< 0.1	mg/L	No
<i>Nitrite</i>	January 15, 2018	1.0 mg/L	< 0.1	mg/L	No
<i>Nitrate</i>	January 15, 2018	10.0 mg/L	< 0.1	mg/L	No

<b>2017 Summary of Lead Testing</b> (1ppm = 1mg/L)							
Location/ Type	Number of Samples	Range of Lead Results (#-#)	Unit of Measure	Range of Alkalinity Results (#-#)	Unit of Measure	Average pH	Exceedance
Residential Plumbing							
Non-Residential Plumbing							
Distribution	7	0.00002 – 0.00045	mg/L	64 - 86	mg/L	7.00	0

<b>2017 Summary of Organic Parameters Tested</b> Annual sampling or most recent result (1ug/L = 0.001mg/L)					
Parameter	Sample Date	Standard (maximum concentration)	Result Value	Unit of Measure	Exceedance
Alachlor	June 19, 2017	0.005 mg/L	< 0.3	ug/L	No
Atrazine + N-dealkylated metabolites	June 19, 2017	0.005 mg/L	< 0.5	ug/L	No
Azinphos-methyl	June 19, 2017	0.02 mg/L	< 1	ug/L	No
Benzene	June 19, 2017	0.001 mg/L	< 0.5	ug/L	No
Benzo(a)pyrene	June 19, 2017	0.00001 mg/L	< 0.005	ug/L	No
Bromoxynil	June 19, 2017	0.005 mg/L	< 0.3	ug/L	No
Carbaryl	June 19, 2017	0.09 mg/L	< 3	ug/L	No
Carbofuran	June 19, 2017	0.09 mg/L	< 1	ug/L	No
Carbon Tetrachloride	June 19, 2017	0.002 mg/L	< 0.2	ug/L	No
Chlorpyrifos	June 19, 2017	0.09 mg/L	< 0.5	ug/L	No
Diazinon	June 19, 2017	0.02 mg/L	< 1	ug/L	No
Dicamba	June 19, 2017	0.12 mg/L	< 5	ug/L	No
1,2-Dichlorobenzene	June 19, 2017	0.2 mg/L	< 0.1	ug/L	No
1,4-Dichlorobenzene	June 19, 2017	0.005 mg/L	< 0.2	ug/L	No
1,2-Dichloroethane	June 19, 2017	0.005 mg/L	< 0.1	ug/L	No
1,1-Dichloroethylene (vinylidene chloride)	June 19, 2017	0.014 mg/L	< 0.1	ug/L	No
Dichloromethane	June 19, 2017	0.05 mg/L	< 0.3	ug/L	No
2-4 Dichlorophenol	June 19, 2017	0.9 mg/L	< 0.1	ug/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	June 19, 2017	0.1 mg/L	< 5	ug/L	No
Diclofop-methyl	June 19, 2017	0.009 mg/L	< 0.5	ug/L	No
Dimethoate	June 19, 2017	0.02 mg/L	< 1	ug/L	No
Diquat	June 19, 2017	0.07 mg/L	< 5	ug/L	No
Diuron	June 19, 2017	0.15 mg/L	< 5	ug/L	No



<b>2017 Summary of Organic Parameters Tested</b>					
Annual sampling or most recent result (1ug/L = 0.001mg/L)					
Parameter	Sample Date	Standard (maximum concentration)	Result Value	Unit of Measure	Exceedance
Glyphosate	June 19, 2017	0.28 mg/L	< 25	ug/L	No
Haloacetic Acid	January 15, 2018		34.7	ug/L	No
Malathion	June 19, 2017	0.19 mg/L	< 5	ug/L	No
2 Methyl-4 Chlorophenoxyacetic (MCPA)	June 19, 2017	0.1 mg/L	< 0.00012	mg/L	No
Metolachlor	June 19, 2017	0.05 mg/L	< 3	ug/L	No
Metribuzin	June 19, 2017	0.08 mg/L	< 3	ug/L	No
Monochlorobenzene	June 19, 2017	0.08 mg/L	< 0.2	ug/L	No
Paraquat	June 19, 2017	0.01 mg/L	< 1	ug/L	No
Pentachlorophenol	June 19, 2017	0.06mg/L	< 0.1	ug/L	No
Phorate	June 19, 2017	0.002 mg/L	< 0.3	ug/L	No
Picloram	June 19, 2017	0.19 mg/L	< 5	ug/L	No
Polychlorinated Biphenyls (PCB)	June 19, 2017	0.003 mg/L	< 0.05	ug/L	No
Prometryne	June 19, 2017	0.001 mg/L	< 0.1	ug/L	No
Simazine	June 19, 2017	0.01 mg/L	< 0.5	ug/L	No
THM	January 15, 2018	0.100 mg/L	42.0	ug/L	No
Terbufos	June 19, 2017	0.001 mg/L	< 0.3	ug/L	No
Tetrachloroethylene	June 19, 2017	0.03 mg/L	< 0.2	ug/L	No
2,3,4,6-Tetrachlorophenol	June 19, 2017	0.1 mg/L	< 0.1	ug/L	No
Triallate	June 19, 2017	0.23 mg/L	< 10	ug/L	No
Trichloroethylene	June 19, 2017	0.005 mg/L	< 0.1	ug/L	No
2,4,6-Trichlorophenol	June 19, 2017	0.005 mg/L	< 0.1	ug/L	No
Trifluralin	June 19, 2017	0.045 mg/L	< 0.5	ug/L	No
Vinyl Chloride	June 19, 2017	0.002 mg/L	< 0.2	ug/L	No

<b>Inorganic or Organic Parameters that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards</b>			
Only complete if category is large municipal residential, small municipal residential, large municipal non-residential, small municipal non-residential, large non-municipal non-residential			
Parameter	Result Value	Unit of Measure	Date of Sample
n/a			

Section 6: Significant Expenses Incurred

No significant expenses were

- Install required equipment
- Repair required equipment
- Replace required equipment
- None during this period

**Briefly Describe Incident and/or Expenses Incurred:**

No.	Project Name	Description	Cost
1	Distribution Residential Meter Replacement	Distribution meters to be replaced over 10 year period commencing in 2016, with estimated 150 meters to be changed per year. 472 meters were installed in 2017.	\$ 9,500
2	Watermain Replacement and Installation	Remove existing 100mm water main on Kenyon St East between Main St North and Bishop St North, and install new 150mm watermain. Remove existing 50mm service line and install 150mm watermain on Dominion St South between Kenyon St East and Centre St.	\$ 120,000
3	Electric Sludge Valve Replacement	Due to on-going operational and environmental issues. 2 electric sludge valves were replaced in the water treatment plant by an electric valves from a different manufacturer that were water tight and all electrical was changed out the ensure no moisture build up.	\$ 16, 000
4	Hydrant and Valve Replacement	On-going annual project to replace defective or ageing equipment	\$ 18,500
5	Flocculator Installation	Replaced flocculator due to mechanical damage causing complete unit failure.	\$ 5,500

**Section 7: Compliance with Licenses, Permits, Approvals and Orders**

The system is an approved system through the accreditation process that was rolled out by the Ministry of the Environment and Climate Control in 2011. The operating authority strives to remain compliant with the Drinking Water Quality Management Standard, the Safe Drinking Water Act and all associated procedures or a guideline. This approach is utilized for creating a multi-barrier approach to ensure safe drinking water.

The following table is a listing of all permits and or licenses that apply to this system:

<i>Description</i>	<i>Number</i>	<i>Version</i>	<i>Issue Date</i>	<i>Expiry Date</i>
Water Works License	181-101	2	March 22, 2016	March 21, 2021
Water Works Permit	181-201	3	March 22, 2016	March 21, 2021
Permit to Take Water	0512-8VVPRD		July 6, 2012	July 8, 2022

This system actively engages in all required internal and external auditing, as per the Drinking Water Management Standard. The latest external third-party surveillance audit was completed on December 6, 2017. The results indicated an effective system with 2 minor opportunities for improvement.

During this period, all raw water flows were compliant with all permits to take water and are currently at 27.0% of the allowable limit. All treated flows were well within the rated capacity for the system and as previously stated the system is currently only at 22.4% of the rated capacity. Furthermore, no operational limits were exceeded during this reporting timeframe.

All disinfection equipment was operated in such a manner that all license requirements were met at all times. The treatment system was operated at all times to ensure compliance with the Procedure for Disinfection of Drinking Water in Ontario.

All equipment was maintained as per operations manuals and/or calibrated annually by a certified technician.



**Section 8: Non-Compliance with Licenses, Permits, Approvals and Orders**

There was 1 instance of non-compliance in regard to regulatory requirements, which was a planned shut down for a water main replacement. All residents were placed on a temporarily overland water main prior to shut down and work commencement. All licensing, permit and/or approval requirements were met during this reporting period. Furthermore, there were no orders or additional requirements issued to this system.

<b>2017 Reported Incident in accordance to subsection 18(1) of the Safe Drinking Water Act or Schedule 16 of O. Reg 170/03</b>					
<i>Incident Date</i>	<i>Parameter</i>	<i>Result</i>	<i>Unit of Measure</i>	<i>Corrective Action</i>	<i>Corrective Action Date</i>
24-Aug-17	Low Pressure	< 20	psi	Preventative boil water due to watermain replacement. 13 Residents effected. All testing and sampling performed as per procedure.	03-Oct-17

**Section 9: Township of North Glengarry Endorsement of Summary Report**

A copy of the report was presented to all members of the municipal council through the Public Works Committee meeting held on February 20, 2018, see appendix D for motion. The report was also made available to the public through the Township of North Glengarry website or upon individual request at the Main office, located at 90 Main St South in Alexandria, or at the Public Works Office, located at 63 Kenyon St West in Alexandria

This report has been endorsed by Ryan Morton, Director of Public Works on behalf of Township of North Glengarry Council.

**Section 8: Contact**

All efforts have been made to provide accurate and up to date information in a relevant format. In the event that additional information is required please submit all verbal requests by phone at 613-525-3087; in writing by mail to 63 Kenyon St West. P.O. Box 700, Alexandria Ontario, K0C 1A0; or in writing by email to dean@northglengarry.ca

Appendix A:

2017 Alexandria Treated Flows (m<sup>3</sup>/day)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1,429	1,626	1,603	1,792	1,291	2,102	2,275	2,133	2,079	1,602	1,531	1,212
2	1,454	1,364	1,557	1,614	1,791	1,443	2,219	2,078	2,066	1,291	1,645	2,175
3	1,569	1,334	1,278	1,694	1,541	1,772	1,907	2,379	2,148	1,681	1,262	1,557
4	2,003	2,217	1,862	1,522	1,602	2,236	2,153	1,585	1,818	1,932	2,043	1,861
5	1,931	1,913	1,404	1,593	1,630	1,963	2,044	2,203	1,931	1,643	1,499	1,642
6	1,821	1,586	1,540	1,620	1,903	1,849	2,045	1,865	2,637	1,622	1,435	1,528
7	2,107	1,474	1,551	1,263	1,310	2,070	2,168	1,506	2,712	1,323	1,656	1,745
8	1,702	1,824	1,623	1,455	1,441	2,486	2,248	2,179	2,686	1,390	1,587	1,367
9	1,654	1,712	1,547	1,691	1,733	2,242	2,297	2,325	2,414	1,185	1,893	1,858
10	1,713	1,165	1,260	1,845	1,559	2,333	1,420	2,180	1,979	1,472	1,389	1,646
11	1,050	2,083	1,936	1,470	2,026	2,267	1,873	1,555	2,375	1,387	2,042	1,581
12	1,490	1,586	1,447	1,638	1,579	2,208	2,649	2,215	2,191	1,947	1,714	1,746
13	1,357	1,481	1,347	1,857	1,833	1,833	2,417	2,401	2,192	1,763	1,681	1,710
14	2,039	1,637	1,564	1,227	1,975	2,491	1,889	2,049	2,355	1,574	1,589	1,545
15	1,410	1,380	1,673	1,875	2,111	2,247	2,216	1,784	1,977	1,733	1,689	1,514
16	1,479	1,592	1,718	1,642	2,123	2,078	2,262	1,643	1,863	1,699	1,633	1,975
17	1,534	1,376	1,560	1,517	2,238	2,209	2,099	2,792	2,291	1,623	1,512	1,433
18	1,649	1,915	1,705	1,658	2,040	1,906	2,086	1,972	2,092	1,594	1,781	1,691
19	1,700	1,390	1,447	1,347	2,000	2,145	2,187	2,312	2,219	1,824	1,581	1,758
20	1,396	1,356	1,625	1,926	2,442	2,315	2,373	2,019	2,059	1,535	1,644	1,480
21	1,657	1,594	1,649	1,838	1,765	1,973	1,977	1,987	2,289	1,355	1,876	1,712
22	1,497	1,536	1,564	1,541	1,918	2,341	2,235	2,342	2,014	2,024	1,762	1,622
23	1,449	1,990	1,708	1,330	2,339	1,806	2,125	2,220	2,470	1,765	1,881	1,903
24	1,687	1,286	1,524	1,669	2,074	2,314	2,054	2,028	1,935	1,626	1,187	1,427
25	1,498	1,873	1,698	1,502	2,113	2,103	2,167	2,075	2,602	1,490	2,010	1,347
26	1,481	1,556	1,599	1,735	1,706	1,761	2,115	2,292	1,855	1,569	1,481	1,596
27	1,649	1,497	1,578	1,987	2,337	1,663	2,142	1,929	1,619	1,265	1,732	1,632
28	1,403	1,520	1,643	1,382	1,960	2,417	2,046	2,431	1,560	2,033	1,660	2,009
29	1,409		1,192	2,037	2,044	1,410	1,968	2,062	1,407	1,435	1,602	1,547
30	1,415		1,980	1,656	1,948	1,916	1,875	2,127	1,744	1,616	1,810	1,743
31	1,486		1,335		2,565		2,158	2,043		1,612		1,609
Minimum	1,050	1,165	1,192	1,227	1,291	1,410	1,420	1,506	1,407	1,185	1,187	1,212
Average	1,584	1,602	1,572	1,631	1,901	2,063	2,119	2,087	2,119	1,600	1,660	1,651
Maximum	2,107	2,217	1,980	2,037	2,565	2,491	2,649	2,792	2,712	2,033	2,043	2,175
Total	49,118	44,863	48,717	48,922	58,936	61,899	65,688	64,711	63,579	49,611	49,807	51,171

2017
Annual Treated Flows Summary
1,050
1,799
2,792
657,023

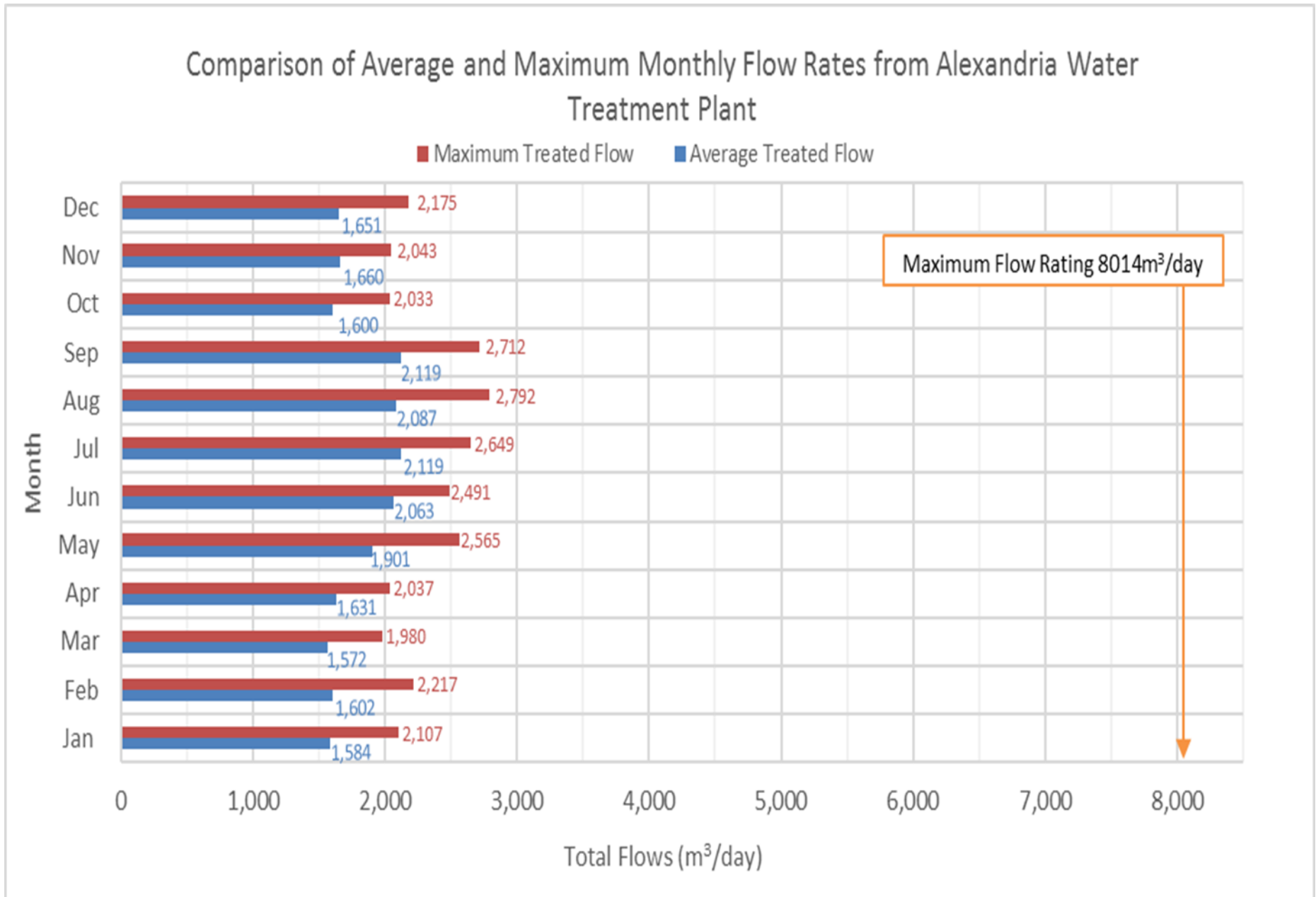
Appendix B:

2017 Alexandria Maximum Instantaneous Flows (m<sup>3</sup>/sec)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0.043	0.043	0.043	0.043	0.043	0.042	0.044	0.045	0.044	0.043	0.043	0.043
2	0.043	0.043	0.043	0.043	0.044	0.043	0.043	0.063	0.043	0.043	0.043	0.043
3	0.043	0.044	0.043	0.044	0.043	0.043	0.044	0.043	0.043	0.044	0.043	0.043
4	0.043	0.065	0.044	0.043	0.043	0.043	0.044	0.043	0.043	0.044	0.043	0.043
5	0.043	0.043	0.044	0.043	0.043	0.043	0.044	0.043	0.046	0.045	0.043	0.044
6	0.043	0.044	0.043	0.043	0.043	0.044	0.044	0.043	0.043	0.043	0.044	0.044
7	0.042	0.043	0.046	0.043	0.043	0.044	0.043	0.043	0.043	0.043	0.043	0.044
8	0.043	0.043	0.043	0.043	0.043	0.043	0.043	0.043	0.042	0.043	0.043	0.044
9	0.043	0.043	0.043	0.044	0.043	0.044	0.043	0.043	0.048	0.044	0.043	0.043
10	0.043	0.043	0.043	0.067	0.043	0.043	0.043	0.043	0.043	0.044	0.043	0.044
11	0.042	0.043	0.043	0.061	0.043	0.043	0.043	0.043	0.059	0.044	0.043	0.043
12	0.042	0.043	0.042	0.044	0.043	0.045	0.043	0.044	0.043	0.043	0.043	0.045
13	0.043	0.044	0.043	0.044	0.043	0.043	0.043	0.043	0.043	0.044	0.043	0.044
14	0.043	0.046	0.043	0.044	0.043	0.042	0.043	0.044	0.043	0.043	0.045	0.043
15	0.043	0.043	0.063	0.044	0.044	0.043	0.043	0.043	0.043	0.048	0.043	0.043
16	0.043	0.043	0.043	0.043	0.044	0.043	0.042	0.044	0.043	0.045	0.043	0.043
17	0.044	0.043	0.043	0.043	0.044	0.042	0.043	0.047	0.044	0.044	0.043	0.044
18	0.043	0.043	0.043	0.045	0.043	0.042	0.042	0.044	0.044	0.044	0.043	0.044
19	0.043	0.043	0.043	0.043	0.044	0.043	0.043	0.043	0.045	0.044	0.043	0.044
20	0.043	0.043	0.043	0.044	0.043	0.043	0.043	0.043	0.045	0.043	0.043	0.044
21	0.043	0.046	0.043	0.044	0.043	0.044	0.043	0.044	0.044	0.043	0.045	0.043
22	0.043	0.043	0.043	0.043	0.043	0.069	0.043	0.044	0.043	0.043	0.043	0.043
23	0.045	0.047	0.043	0.044	0.044	0.043	0.043	0.047	0.048	0.044	0.043	0.043
24	0.045	0.043	0.043	0.043	0.043	0.043	0.043	0.043	0.043	0.044	0.043	0.043
25	0.043	0.043	0.043	0.046	0.043	0.043	0.045	0.044	0.049	0.043	0.043	0.044
26	0.043	0.043	0.043	0.068	0.043	0.043	0.043	0.043	0.045	0.044	0.043	0.044
27	0.043	0.043	0.043	0.044	0.043	0.044	0.043	0.044	0.044	0.043	0.043	0.044
28	0.042	0.043	0.043	0.044	0.043	0.044	0.043	0.043	0.044	0.044	0.045	0.044
29	0.043		0.043	0.043	0.043	0.043	0.043	0.047	0.043	0.044	0.043	0.043
30	0.043		0.043	0.043	0.043	0.044	0.042	0.043	0.043	0.043	0.043	0.043
31	0.045		0.043		0.043		0.043	0.045		0.043		0.044
Minimum	0.042	0.043	0.042	0.043	0.043	0.042	0.042	0.043	0.042	0.043	0.043	0.043
Average	0.043	0.044	0.044	0.046	0.043	0.044	0.043	0.044	0.044	0.044	0.043	0.044
Maximum	0.045	0.065	0.063	0.068	0.044	0.069	0.045	0.063	0.059	0.048	0.045	0.045

2017 Annual Instantaneous Flows Summary
0.042
0.044
0.069

Appendix C



Appendix D

**Township of North Glengarry**  
**Public Works Committee**  
**MOTION**

Moved by: Mike Sopratto

Seconded by: Janie MacDonald

Date: Feb 20/18

**Subject: 2017 Annual and Summary Reports**

**Be it resolved;**

**THAT** the Public Works Committee of the Township of North Glengarry, hereby receives the Water Works Alexandria and Glen Robertson 2017 Annual and Summary Reports presented by Angela Cullen.

Unanimous  Carried  Defeated  Ayes  Nays

Motion number: 2018 - 08

Brian Caddell, Committee Chair

Brian Caddell