



Matachewan Drinking Water System

2019 ANNUAL/SUMMARY REPORT

Prepared by the Ontario Clean Water Agency
on behalf of the Township of Matachewan

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INTRODUCTION

Municipalities throughout Ontario have been required to comply with Ontario Regulation 170/03 made under the *Safe Drinking Water Act* (SDWA) since June 2003. The Act was enacted following recommendations made by Commissioner O'Conner after the Walkerton Inquiry. The Act's purpose is to protect human health through the control and regulation of drinking water systems. O. Reg. 170/03 regulates drinking water testing, use of licensed laboratories, treatment requirements and reporting requirements.

Section 11 of Regulation 170/03 requires the owner to produce an Annual Report. This report must include the following:

1. Description of system & chemical(s) used
2. Summary of any adverse water quality reports and corrective actions
3. Summary of all required testing
4. Description of any major expenses incurred to install, repair or replace equipment

This annual report must be completed by February 28th of each year.

Schedule 22 of the regulation also requires a Summary Report which must be presented & accepted by Council by March 31st of each year for the preceding calendar year.

The report must list the requirements of the Act, its regulations, the system's Drinking Water Works Permit (DWWP), Municipal Drinking Water Licence (MDWL), Certificate of Approval (if applicable), and any regulatory requirements the system failed to meet during the reporting period. The report must also specify the duration of the failure, and for each failure referred to, describe the measures that were taken to correct the failure.

The *Safe Drinking Water Act* (2002) and the drinking water regulations can be viewed at the following website: <http://www.e-laws.gov.on.ca>.

To enable the Owner to assess the rated capacity of their system to meet existing and future planned water uses, the following information is also required in the report.

1. A summary of the quantities and flow rates of water supplied during the reporting period, including the monthly average and the maximum daily flows,
2. A comparison of the summary to the rated capacity and flow rates approved in the systems approval, drinking water works permit or municipal drinking water licence or a written agreement if the system is receiving all its water from another system under an agreement.

The reports have been prepared by the Ontario Clean Water Agency (OCWA) on behalf of the Owner and presented to council as the 2019 Annual/Summary Report.



Matachewan Drinking Water System

Section 11

2019 ANNUAL REPORT



Section 11 - ANNUAL REPORT

1.0 INTRODUCTION

Drinking-Water System Name:	Matachewan Drinking Water System
Drinking-Water System No.:	220003653
Drinking-Water System Owner:	The Corporation of the Township of Matachewan
Drinking-Water System Category:	Large Municipal, Residential System
Period being reported:	January 1, 2019 to December 31, 2019

Does your 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
at <http://www.matachewan.com/>

Location where the report required under O. Reg. 170/03 Schedule 22 will be available for inspection.

Matachewan Township Office
1 Moyneur Avenue,
Matachewan Ontario P0K 1N0

Drinking Water Systems that receive drinking water from the Matachewan Drinking Water System

The Matachewan Drinking Water System provides all drinking water to the community of Matachewan.

The Annual Report was not provided to any other Drinking Water System Owners.

The Ontario Clean Water Agency prepared the 2019 Annual/Summary Report for the Matachewan Drinking Water System and provided a copy to the system owner; the Township of Matachewan. The Matachewan Drinking Water System is a stand-alone system that does not receive water from or send water to another system.

Notification to system users that the Annual Report is available for viewing is accomplished through:

- A notice on the Town's website
- A notice in the Town's News Letter



2.0 MATACHEWAN DRINKING WATER SYSTEM (DWS No. 220003653)

The Matachewan Drinking Water System is owned by the Corporation of the Township of Matachewan and consists of a Class 2 water distribution and supply subsystem. The Ontario Clean Water Agency (OCWA) is the accredited operating authority and the designated the Overall Responsible Operator for both the water supply and water distribution facilities.

Raw Water Supply

The water treatment system obtains its water from two production wells with a combined allowable daily volume of 908 m³/day. The wells are located at 391 Bernard Street, adjacent to the Montreal River. The well head assembly for Well 1 is located within the main building for the water treatment plant while the well head assembly for Well 2 is located outside approximately 5 m away. Both wells consist of a 150 mm diameter steel casing; Well 1 is drilled to a depth of 39.6 m and Well 2 is drilled to a depth of 55 m (from video inspection conducted by IWS on April 11, 2018). Well 1 is equipped with a vertical turbine pump assembly and a fixed-rate control system to pump at a maximum rate of 22 L/s. Well 2 is equipped with a submersible pump rated at 20 L/s. An insertion type magnetic flow meter is installed in the 150 mm diameter line that directs water into the treatment process. Also included are pump-to-waste capabilities from a common pump discharge line.

The water quality from Well 2 has deteriorated. A video inspection was conducted in April 2018, the well was rehabilitated in November 2018 and a pitless adapter and submersible pump were installed in December. The well was being used as a standby well in 2019 for emergencies and distribution maintenance. It will be put back into operation after the new iron and manganese removal filtration plant is on-line in 2020.

Water Treatment

The water treatment plant houses the treatment process equipment and wellhead assembly for Well 1. The treatment process equipment includes a sodium hypochlorite disinfection system, iron and manganese sequestering system and chlorine contact chamber. The sodium hypochlorite disinfection system consists of a 200 L storage vessel and duplicated chemical metering pumps with automatic switchover. The operation of the chemical pumps are synchronous with the start/stop cycle of the well pumps. The iron and manganese sequestering system consists of a 200 L sodium silicate solution tank and a single chemical metering pump (operation is also synchronous with the start/stop cycling of the well pumps). The chlorine contact chamber consists of a 750 mm diameter x 54 m long PVC constructed pressure pipe which provides appropriate contact time to ensure adequate disinfection of the water before entering the distribution system. The free chlorine residual is continuously monitored through an alarmed analyzer. There is also a 100 mm diameter in-line magnetic flow meter installed on the discharge piping (point of entry into the chlorine contact chamber). The plant is controlled by a programmable logic controller (PLC) which communicates with the water tower to control the plant start and stop cycles.



The plant underwent a major upgrade to install an iron and manganese removal filter system (Filtronics brand), to remove the existing iron and manganese sequestering system. The project was completed in December 2019 and will be put into operation in 2020.

Water Storage and Pumping Capabilities

A new elevated water tower with a tank volume of 650 m³ was constructed and put into operation on December 16, 2015. The tower is located at the South East corner of Anita Street and Amabilis Avenue in the community of Matachewan and is used to provide fire storage, equalization storage and emergency storage capabilities. The tower houses a sodium hypochlorite feed system consisting of two metering pumps (one duty and one spare), two sodium hypochlorite tanks and a chlorine residual analyzer. A flow meter, pressure gauge, process piping, valves, controls and instrumentation are also on-site.

Emergency Power

A 100 KW diesel powered generator is available at the water treatment building and is capable of supplying power to the entire facility during power failures.

A 15 KW diesel generator is also available outside the water tower to provide standby power during emergencies.

Distribution System

The Matachewan Drinking Water System is categorized as a Large Municipal Residential Drinking Water System and serves an estimated population of 450 residents. The distribution system consists of approximately 191 active residential service connections. A review of the distribution system drawings indicated that water mains are primarily six, eight and ten inch in diameter and constructed of ductile iron with PVC constructed pipe used in the upgraded sections of Town. Additionally, service connections to private residences consist primarily of ¾ inch copper pipe. There are an estimated 66 fire hydrants connected to the system for fire protection.

3.0 LIST OF WATER TREATMENT CHEMICALS USED OVER THE REPORTING PERIOD

The following chemicals were used in the treatment process at the Matachewan Water Treatment Plant.

- Sodium hypochlorite – Disinfection
- Sodium silicate – Iron and Manganese Sequestering

All treatment chemicals meet AWWA and NSF/ANSI standards.



4.0 SIGNIFICANT EXPENSES INCURRED IN THE DRINKING WATER SYSTEM

OCWA is committed to maintaining the assets of the drinking water system and maintains a program of scheduled inspection and maintenance activities using a computerized Work Management System (WMS).

Significant expenses incurred in the drinking water system include:

- Installed of a Filtronics Iron and Manganese removal filtration system
- Installed a dedicated Backwash Storage Tanks (two tanks)
- Removed existing iron and manganese sequestering system and associated components (sodium silicate)
- Electrical Upgrades (i.e. MCC panels, breakers, etc.)
- Control System Upgrades (i.e. New SCADA system)
- Building improvements/Upgrades including the HVAC system
- Renovations to chemical feed system, including new pumps and controls.
- Installed an auto flushing device at the end of Rye Street.

5.0 DETAILS ON NOTICES OF ADVERSE TEST RESULTS AND OTHER PROBLEMS REPORTED TO & SUBMITTED TO THE SPILLS ACTION CENTER

Based on information kept on record by OCWA, three (3) adverse water quality incidents were reported to the Ministry's Spills Action Centre.

1. **AWQI 145237** - *April 20th*: The system failed to meet CT due to low chlorine from air-locked pumps. The well pumps locked out; however the low chlorine water (0.08 mg/L) was in the contact pipe which was directed to the distribution system and tower once the system was put back on-line. The Timiskaming Health Unit was notified and no boil water advisory (BWA) was issued or any additional actions required. Pumps were primed and reset, chlorine disinfection was restored and increased. The local Health Unit and the Ministry's Spills Action center (SAC) were verbally notified. Notification and resolution reports were prepared and submitted on April 20th.
2. **AWQI 148118** - *September 17th*: The duty sodium hypochlorite pump did not turn on when plant was in operation. The well pump ran part of a cycle with the duty hypochlorite pumps off. CT was not met as zero chlorine residual was measured from 6:56 PM to 7:22 PM. Upgrade work was done at the plant earlier that day and the standby well (Well #2) was flushed with the hypochlorite pumps off.

The Health Unit was notified and a precautionary BWA was issued for the entire Town. Two sets of 3 bacteriological samples were collected 24 hours apart and the results were acceptable having no total coliforms or *E. coli*. The BWA was lifted on Friday, September 20th at approximately 1440 hours. The resolution report was submitted on September 23rd.



The issue was investigated and the start/stop button on the pump was corroded causing the pump not to start when needed. The on-call operator was able to restart the pump and restore disinfection. These pumps are being replaced as part of the upgrades.

- AWQI 148364 - October 2nd:** Operator responded to a low chlorine alarm at approximately 2100 hours on October 2nd. Upon arrival, the plant was shutdown. Operator could not determine with 100% certainty if unchlorinated water entered the distribution system and reported the incident as an AWQI to the local Health Unit (MOH), SAC, and the Owner. The MOH immediately issued a precautionary BWA.

The sodium hypochlorite control panel was moved approximately 1 foot earlier that day as part of the upgrades. This caused the status of the switch over panel to default from remote (automatic) to local (manual) so when the well pump turned on, the hypo pump did not resulting in the low chlorine.

The operator restored disinfection, flushed the hydrant in front of the plant and tested free chlorine residual in the distribution system at 2 locations (the curling arena = 1.25 mg/L at 2239 hours and the gym = 1.26 mg/L at 2247 hours). Two sets of 3 bacteriological samples were collected 24 hours apart (October 3rd and October 4th) and results were acceptable. The BWA was lifted on Saturday, October 5th at approximately 1520 hours and the resolution report was submitted on October 7th.

A capital works procedure was developed and reviewed by the Capital Manager to ensure all equipment is in proper working condition before leaving the plant

The procedure on how to respond to a Low Chlorine Residual at the Matachewan Water Treatment Plant was also reviewed with all operators.

6.0 MICROBIOLOGICAL TESTING PERFORMED DURING THE REPORTING PERIOD

Summary of Microbiological Data

Sample Type	# of Samples	Range of <i>E. coli</i> Results (min to max)	Range of Total Coliform Results (min to max)	# of HPC Samples	Range of HPC Results (min to max)
Raw (Well No. 1)	53	0 to 0	0 to 0	0	N/A
Raw (Well No. 2)	13 ^{Note 2}	0 to 0	0 to 31	0	N/A
Treated	53	0 to 0	0 to 0	53	< 10 to 300
Distribution	106	0 to 0	0 to 0	52	< 10 to 80

Maximum Allowable Concentration (MAC) for *E. coli* = 0 Counts/100 mL

MAC for Total Coliforms = 0 Counts/100 mL

"<" denotes less than the laboratory's method detection limit.

Notes:

- One microbiological sample is collected and tested each week from the raw (each well) and treated water supply. A total of two microbiological samples are collected and tested each week from the Matachewan distribution system. At least 25% of the distribution samples are tested for HPC bacteria.



- Well 2 was taken off-line on September 10, 2018 in preparation for rehabilitation and upgrades. The well remained off-line except when used to fill the tower on December 18th after it was drained for cleaning and maintenance. Bacteriological sampling of the well began on October 16, 2019.

Refer to [Appendix A](#) for a monthly summary of microbiological test results.

7.0 OPERATIONAL TESTING PERFORMED DURING THE REPORTING PERIOD

Summary of Raw Water Turbidity Data

Parameter	# of Samples	Range of Results (min to max)	Unit of Measure
Turbidity (Well No. 1)	21	0.14 to 1.67	NTU
Turbidity (Well No. 2)	3 ^{Note 2}	0.14 to 0.69	NTU

Notes:

- Turbidity samples are required once every month.
- Well 2 was taken off-line on September 10, 2018 in preparation for rehabilitation and upgrades. The well remained off-line except when used to fill the tower on December 18th after it was drained for cleaning and maintenance. Turbidity sampling of the well began on November 4, 2019.

Continuous Monitoring in the Treatment Process

Parameter	# of Samples	Range of Results (min to max)	Unit of Measure	Standard
Free Chlorine Residual	8760	0.0 ^{Note 2} to 4.79	mg/L	CT*

Notes:

- For continuous monitors 8760 is used as the number of samples.
- CT is the concentration of chlorine in the water times the time of contact that the chlorine has with the water. It is used to demonstrate the level of disinfection treatment in the water. CT calculations are performed for the Matachewan water plant if the free chlorine residual level drops below 0.28 mg/L to ensure primary disinfection is achieved.

April 20th – the system failed to meet CT due to low chlorine from air-locked pumps (AWQI 145237).

June 26th – low free chlorine residual of 0.24 mg/L due to pump air lock. CT calculated and passed.

September 17th – low free chlorine residual of 0.00mg/L when duty hypo pump did not turn on when plant was in operation (AWQI 148118).

October 2 – the system failed CT when the sodium hypochlorite pump failed to start causing a low chlorine incident (AWQI 148364).

Summary of Chlorine Residual Data in the Distribution System

Parameter	# of Samples	Range of Results (min to max)	Unit of Measure	Standard
Free Chlorine Residual	368	0.27 to 2.2	mg/L	≥ 0.05

Note: A total of seven operational checks for chlorine residual in the distribution system are collected each week. Four (4) samples are tested one day and three (3) on a second day. The sample sets are collected at least 48-hours apart and samples collected on the same day are from different locations.



Refer to *Appendix B* for a monthly summary of the above operational data.

Summary of Nitrate & Nitrite Data (sampled at the plant’s point of entry into the distribution every quarter)

Date of Sample	Nitrate Result Value	Nitrite Result Value	Unit of Measure	Exceedance
January 8	0.26	< 0.008	mg/L	No
April 4	< 0.05	< 0.05	mg/L	No
July 10	0.28	< 0.05	mg/L	No
October 10	0.23	< 0.05	mg/L	No

Maximum Allowable Concentration (MAC) for Nitrate = 10 mg/L
 MAC for Nitrite = 1 mg/L

Summary of Total Trihalomethane Data (additional THM samples collected in 2019)

Date of Sample	Result Value	Unit of Measure	Quarter Average	Running Annual Average	Exceedance
January 8	77.4	ug/L			
February 14	73.8	ug/L	71.9		
March 21	64.6	ug/L			
April 4	81.5	ug/L			
May 13	89.1	ug/L	81.8		
June 10	74.7	ug/L		80.04	No
July 10	98.6	ug/L			
September 16	49	ug/L	73.8		
October 10	99	ug/L			
November 18	89.5	ug/L	92.7		
December 9	89.5	ug/L			

Maximum Allowable Concentration (MAC) for Total Trihalomethanes = 100 ug/L (Running Annual Average)

Haloacetic Acid (HAAs) Sampling and Testing Required under Schedule 13-6.1

New sampling requirements for Haloacetic Acids (HAAs) came into effect on January 1st, 2017. At least one distribution sample must be taken in each calendar quarter, from a point in the drinking water system’s distribution system, or plumbing that is likely to have an elevated potential for the formation of HAAs. Over the past three years, samples were collected near the plant, in the middle of the distribution system and at the end of the distribution system as per guidance provided in a Ministry’s letter “HAA Concerns” dated May 9, 2018. The sample location with the highest concentration of HAAs is the Town Hall (1 Moyneur Ave.) at the end of the system.

The maximum allowable concentration (MAC) of 80 ug/L is effective January 1st, 2020 and is based on a running annual average of quarterly results (similar to THMs). Results that exceed the MAC must be reported as an adverse water quality incident (AWQI) starting January 1st, 2020. HAA results for 2019 are summarized below.



Summary of Total Haloacetic Acid Data (sampled in the distribution system every quarter)

Date of Sample	Result Value	Unit of Measure	Quarter Average	Running Annual Average	Exceedance
January 8	72	ug/L			
February 14	48	ug/L	53		
March 21	39	ug/L			
April 4	13	ug/L			
May 13	37	ug/L	26.7		
June 10	30	ug/L		56.8	N/A
July 10	85	ug/L	85		
October 10	136	ug/L			
November 18	38	ug/L	62.7		
December 9	14	ug/L			

Maximum Allowable Concentration (MAC) for Total Trihalomethanes = 100 ug/L (Running Annual Average)

Summary of Most Recent Lead Data under Schedule 15.1

(applicable to the following drinking water systems; large municipal residential systems, small, municipal residential systems, and non-municipal year-round residential systems)

The Matachewan Drinking Water System was eligible to follow the “Exemption from Plumbing Sampling” as described in section 15.1-5(9) and 15.1-5(10) of Schedule 15.1 of Ontario Regulation 170/03. The exemption applies to a drinking water system if, in two consecutive periods at reduced sampling, not more than 10% of all samples from plumbing exceed the maximum allowable concentration (MAC) of 10 ug/L for lead. As such, the system was required to test for total alkalinity and pH in one distribution sample collected during the periods of December 15 to April 15 (winter period) and June 15 to October 15 (summer period). This testing is required in every 12-month period with lead testing in every third 12-month period.

Two rounds of alkalinity and pH testing were carried out on March 28th and September 23rd of 2019. Results are summarized in the table below.

Summary of Lead Data (sampled in the distribution system)

Date of Sample	# of Samples	Field pH	Field Temperature (°C)	Alkalinity (mg/L)	Lead (ug/L)
March 28	1	7.96	4.3	120	N/A
September 23	1	7.36	13	127	N/A

Note: Next lead sampling scheduled for 2020



Most Recent Schedule 23 Inorganic Data Tested at the Water Treatment Plant

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Antimony	< 0.5	ug/L	6	No	No
Arsenic	< 1	ug/L	10	No	No
Barium	26.4	ug/L	1000	No	No
Boron	8.9	ug/L	5000	No	No
Cadmium	< 0.1	ug/L	5	No	No
Chromium	1.1	ug/L	50	No	No
Mercury	< 0.1	ug/L	1	No	No
Selenium	< 1	ug/L	50	No	No
Uranium	< 1	ug/L	20	No	No

Note: Sample required every 36 months (sample date = October 3, 2017). Next sampling scheduled for October 2020

Most Recent Schedule 24 Organic Data Tested at the Water Treatment Plant

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Alachlor	< 0.2	ug/L	5	No	No
Atrazine + N-dealkylated metabolites	< 0.5	ug/L	5	No	No
Azinphos-methyl	< 0.2	ug/L	20	No	No
Benzene	< 0.1	ug/L	1	No	No
Benzo(a)pyrene	< 0.005	ug/L	0.01	No	No
Bromoxynil	< 0.09	ug/L	5	No	No
Carbaryl	< 1	ug/L	90	No	No
Carbofuran	< 1	ug/L	90	No	No
Carbon Tetrachloride	< 0.2	ug/L	2	No	No
Chlorpyrifos	< 0.2	ug/L	90	No	No
Diazinon	< 0.2	ug/L	20	No	No
Dicamba	< 0.08	ug/L	120	No	No
1,2-Dichlorobenzene	< 0.2	ug/L	200	No	No
1,4-Dichlorobenzene	< 0.3	ug/L	5	No	No
1,2-Dichloroethane	< 0.2	ug/L	5	No	No
1,1-Dichloroethylene (vinylidene chloride)	< 0.3	ug/L	14	No	No
Dichloromethane	< 0.2	ug/L	50	No	No
2-4 Dichlorophenol	< 0.2	ug/L	900	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	< 0.08	ug/L	100	No	No
Diclofop-methyl	< 0.08	ug/L	9	No	No
Dimethoate	< 0.2	ug/L	20	No	No
Diquat	< 0.6	ug/L	70	No	No
Diuron	< 6	ug/L	150	No	No
Glyphosate	< 20	ug/L	280	No	No
MCPA	< 10	ug/L	100	No	No



Most Recent Schedule 24 Organic Data Tested at the Water Treatment Plant

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Malathion	< 0.2	ug/L	190	No	No
Methoxychlor		ug/L	900	No	No
Metolachlor	< 0.1	ug/L	50	No	No
Metribuzin	< 0.1	ug/L	80	No	No
Monochlorobenzene	< 0.5	ug/L	80	No	No
Paraquat	< 0.3	ug/L	10	No	No
Pentachlorophenol	< 0.3	ug/L	60	No	No
Phorate	< 0.1	ug/L	2	No	No
Picloram	< 0.08	ug/L	190	No	No
Polychlorinated Biphenyls (PCB)	< 0.06	ug/L	3	No	No
Prometryne	< 0.06	ug/L	1	No	No
Simazine	< 0.2	ug/L	10	No	No
Terbufos	< 0.1	ug/L	1	No	No
Tetrachloroethylene	< 0.3	ug/L	30	No	No
2,3,4,6-Tetrachlorophenol	< 0.3	ug/L	100	No	No
Triallate	< 0.1	ug/L	230	No	No
Trichloroethylene	< 0.2	ug/L	10	No	No
2,4,6-Trichlorophenol	< 0.2	ug/L	5	No	No
Trifluralin	< 0.1	ug/L	45	No	No
Vinyl Chloride	< 0.1	ug/L	1	No	No

Note: Sample required every 36 months (sample date = October 3, 2017). Next sampling scheduled for October 2020

Inorganic or Organic Test Results that Exceeded Half the Standard Prescribed in Schedule 2 of the Ontario Drinking Water Quality Standards.

No inorganic or organic parameter(s) listed in Schedule 23 and 24 of Ontario Regulation 170/03 exceeded half the standard found in Schedule 2 of the Ontario Drinking Water Standard (O. Reg. 169/03) during the reporting period.

Most Recent Sodium Data Sampled at the Water Treatment Plant

Date of Sample	# of Samples	Result Value	Unit of Measure	Standard	Exceedance
October 5, 2015	1	8.82	mg/L	20	No

Note: Sample required every 60 months. Next sampling scheduled for October 2020

Most Recent Fluoride Data Sampled at the Water Treatment Plant

Date of Sample	# of Samples	Result Value	Unit of Measure	Standard	Exceedance
October 5, 2015	1	<0.1	mg/L	1.5	No

Note: Sample required every 60 months. Next sampling scheduled for October 2020



Additional Testing Performed in Accordance with an Approval, Order or Legal Instrument

No additional sampling and testing was required for the Matachewan Drinking Water System during the 2019 reporting period.



Matachewan Drinking Water System

Schedule 22

2019 SUMMARY REPORT

FOR MUNICIPALITIES



Schedule 22 - SUMMARY REPORTS FOR MUNICIPALITIES

1.0 INTRODUCTION

Drinking-Water System Name:	Matachewan Drinking Water System
Municipal Drinking Water Licence (MDWL) No.:	279-101-3 (issued November 25, 2015)
Drinking Water Work Permit (DWWP) No.:	279-201-3 (issued November 2, 2016)
Permit to Take Water (PTTW) No.:	3106-9E5LKA (issued January 6, 2014)
Period being reported:	January 1, 2019 to December 31, 2019

2.0 REQUIREMENTS THE SYSTEM FAILED TO MEET

According to information kept on record by OCWA, the Matachewan Drinking Water System failed to meet the following requirements during the 2019 reporting period:

Drinking Water Legislation	Requirement(s) the System Failed to Meet	Duration	Corrective Action(s)	Status
Section 3 (3.2) of PTTW #3106-9E5LKA	Well No.1 exceeded the PTTW limit of 454 m3/day withdrawing a total daily volume of 708 m3/day. The tower was drained as a result of a well pump/SCADA issue the previous day. Well pump 1 was returned to service to fill the drained tower. Well pump ran for an excessive amount of time in order to regain sufficient tower level for pressure/ emergency capabilities.	February 14, 2019	SCADA issue was investigated and addressed. The well pump resumed normal operations.	Complete
	Well No.1 exceeded the PTTW limit of 454 m3/day on several days from April 14 th to the 29 th during normal operations of the plant.	April 14 to 29, 2019	Well No.2 will be put back into operation once the new iron and manganese removal filtration plant is commissioned which will help eliminate these exceedances.	In-progress
	Well No.1 exceeded the PTTW limit withdrawing total daily volumes of greater than 454 m3/day on several days in July. Filling newly installed tanks during the upgrade project from the 16 th to the 18 th may have resulted in the increased volumes. July 9, 10 and 26 exceeded during normal operations of the plant.	July 9, 10, 16, 17, 18 & 26, 2019	Well No.2 will be put back into operation once the new iron and manganese removal filtration plant is commissioned which will help eliminate these exceedances.	In-progress
	The water tower was drained on December 16 th to allow for cleaning and maintenance. When refilling the tower on December 18 th Well No. 1 exceeded its allowable max. volume of 454 m3/day.	December 18, 2019	A new iron and manganese removal filter system was installed in December 2019. Well No. 2 will be put back into regular use once the new system is commissioned.	In-progress



Drinking Water Legislation	Requirement(s) the System Failed to Meet	Duration	Corrective Action(s)	Status
			<p>Both Well No.1 and Well No. 2 can then be used to fill the tower after maintenance activities to prevent exceedances.</p> <p>Operators will also monitor the treated water flows carefully when filling the tower.</p>	

It should also be mentioned that, three (3) adverse water quality incidents were reported to the Ministry’s Spills Action Center. Refer to Section 5.0 – *Details on Notices of Adverse Test Results and Other Problems Reported to & Submitted to the Spills Actions Center* on page 5 of this report for details.

3.0 SUMMARY OF FLOWS AND COMPARISON TO REGULATORY LIMITS

Flow Monitoring

MDWL No. 279-101 requires the owner to install a sufficient number of flow measuring devices to permit the continuous measurement and recording of:

- the flow rate and daily volume of treated water that flows from the treatment subsystem the distribution system, and
- the flow rate and daily volume of water that flows into the treatment subsystem.

The flow monitoring equipment identified in the MDWL is present and operating as required. These flow meters are calibrated on an annual basis as specified in the manufacturers’ instructions.

Water Usage

The following water usage tables summarize the quantities and flow rates of water taken and produced during the 2019 reporting period, including total monthly volumes, average monthly volumes, maximum monthly volumes, and maximum flow rates.



Raw Water

Well No. 1

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	7571	8031	9940	13491	7666	7398	11327	9088	7915	7070	8336	9830	107664
Average Volume (m ³ /d)	244	287	321	450	247	247	365	293	264	228	278	317	295
Maximum Volume (m ³ /d)	292	708	397	571	440	450	602	379	319	379	316	916	916
PTTW - Maximum Allowable Volume (m ³ /day)	454	454	454	454	454	454	454	454	454	454	454	454	454
Maximum Flow Rate (L/min)	1201	1321	1192	1243	1261	1262	1296	1255	1224	1237	1223	1394	1394
PTTW - Maximum Allowable Flow Rate (L/min)	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400

February 14 - Well No. 1 exceeded the total flow limit of 454 m³ allowed in the Permit to take Water (PTTW). The total flow from Well No. 1 was 708 m³. This occurred when filling the tower after it was drained by a well pump/scada system failure the previous day.

April - Well #1 exceeded the total flow limit allowed in the Permit to take Water (PTTW) from April 14th to the 29th due to demand.

July - Well #1 exceeded the total flow limit again on July 9, 10, 16, 17, 18 and 26th due to high demand and upgrade work being done at the plant.

December 18 - Well No. 1 exceeded its PTTW limit of 454 m³/day taking a total volume of 916 m³/day. This exceedance occurred when re-filling the water tower after cleaning and maintenance.

Well No. 2

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	0	0	0	0	0	0	0	0	0	0	0	446	446
Average Volume (m ³ /d)	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.4	1.2
Maximum Volume (m ³ /d)	0	0	0	0	0.0	0	0	0	0	0	0	365	365
PTTW - Maximum Allowable Volume (m ³ /day)	454	454	454	454	454	454	454	454	454	454	454	454	454
Maximum Flow Rate (L/min)	0	0	0	0	0	0	0	0	0	0	0	1292	1292
PTTW - Maximum Allowable Flow Rate (L/min)	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400	1400

Well 2 was taken off-line on September 10, 2018 in preparation for rehabilitation and upgrades. The well remained off-line except when used to fill the tower on December 18th after it was drained for cleaning and maintenance.

Combined Water Taking (Well No. 1 and Well No. 2)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	7571	8031	9940	13491	7666	7398	11467	9088	8464	7070	8336	10276	108798
Average Volume (m ³ /d)	244	287	321	450	247	247	370	293	282	228	278	331	298
Maximum Volume (m ³ /d)	292	708	397	571	440	450	602	379	614	379	316	916	916
PTTW - Maximum Allowable Volume (m ³ /day)	908	908	908	908	908	908	908	908	908	908	908	908	908



The system’s Permit to Take Water #3106-9E5LKA, allows the Township to withdraw water at the following rates:

Well No. 1:	454 m ³ /day	1400 L/minute
Well No. 2:	454 m ³ /day	1400 L/minute
<hr/>		
Total Combined Daily Volume:	908 m ³ /day	

A review of the raw water flow data indicates that the total daily volume of water taken from Well No. 1 exceeded the allowable limit in February, April, July and December during a SCADA failure, high demand, tower maintenance and upgrade work (see comments under Well No. 1 above).

Treated Water

2019 - Monthly Summary of Treated Water Supplied to the Distribution System

Regulated by Municipal Drinking Water Licence (MDWL) #279-101 - Issue 3, dated November 25, 2015

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	8058	8660	10581	14342	7920	7561	11543	9299	8528	7157	8343	10267	112259
Average Volume (m ³ /d)	260	309	341	478	255	252	372	300	284	231	278	331	308
Maximum Volume (m ³ /d)	315	753	423	612	459	458	616	381	614	380	316	955	955
MDWL - Rated Capacity (m ³ /day)	908	908	908	908	908	908	908	908	908	908	908	908	908

The treated water capacity of the plant (908 m³/day) was exceeded on December 18th when filling the tower after cleaning and maintenance. The treated water volume recorded was 955 m³/day.

Note: a treatment plant may be operated temporarily at a maximum daily volume above the limit for the purposes of fighting a large fire or for the maintenance of the drinking water system.

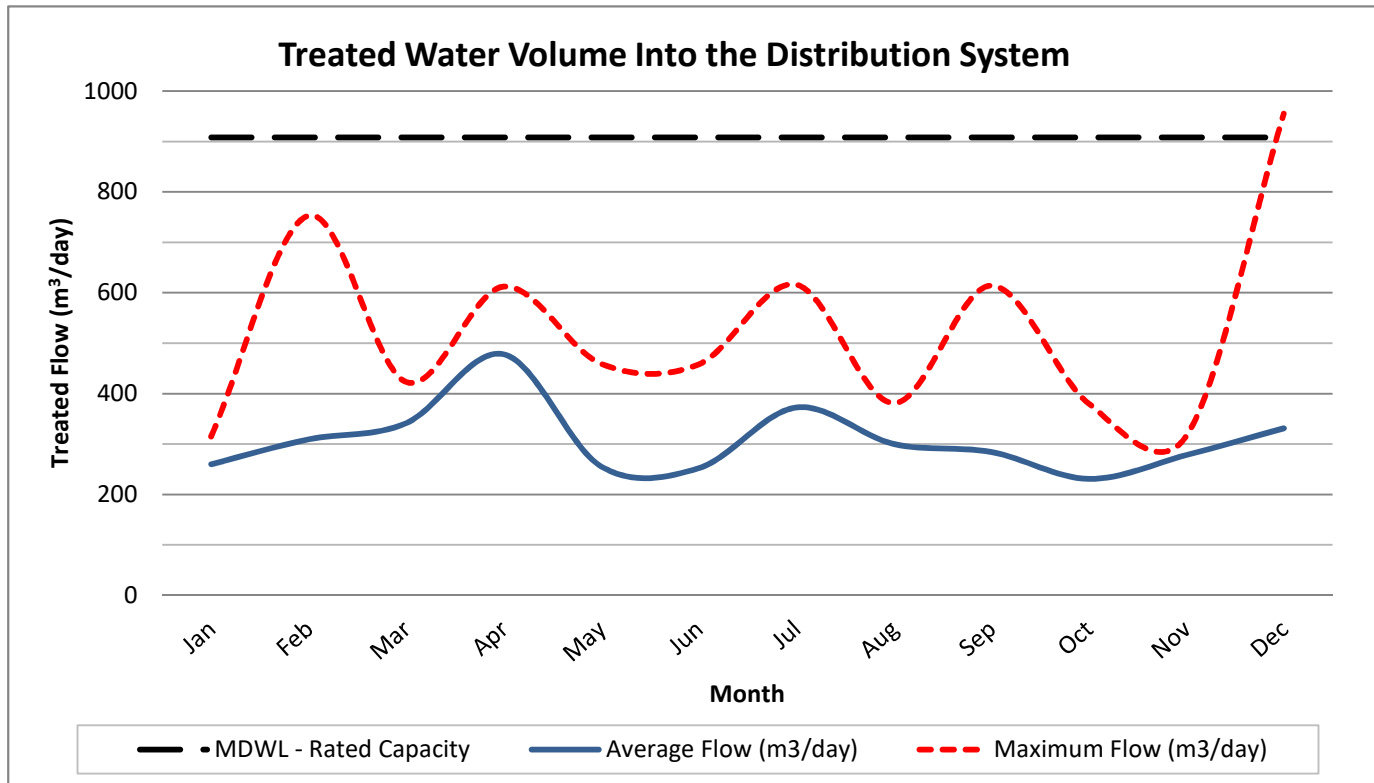
Schedule C, Section 1.0 (1.1) of MDWL No. 279-101 states that the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed 908 m³/day. The system was unable to meet with this limit having a maximum daily volume of 955 m³ on December 18th when filling the water tower after it was drained for cleaning and maintenance.

Note: Schedule C, Section 1.0 (1.3) of MDWL No. 279-101 indicates that a treatment plant may be operated temporarily at a maximum daily volume above the limit for the purposes of fighting a large fire or for the maintenance of the drinking water system.

The following table and graph (Figure 1) compares the average and maximum flow rates into the distribution system to the rated capacity of the system identified in the MDWL.

Figure 1: 2019 - Monthly Volume of Treated Water into the Distribution System

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Flow (m ³ /day)	260	309	341	478	255	252	372	300	284	231	278	331
Maximum Flow (m ³ /day)	315	753	423	612	459	458	616	381	614	380	316	955
MDWL - Rated Capacity	908	908	908	908	908	908	908	908	908	908	908	908
% Rated Capacity	35	83	47	67	51	50	68	42	68	42	35	105





Summary of System Performance

The following information is provided to enable the Owner to assess the capability of the system to meet existing and future water usage needs.

Rated Capacity of the Plant (MDWL)	908 m ³ /day	
Average Daily Flow for 2019	308 m ³ /day	33.9 % of the rated capacity
Maximum Daily Flow for 2019	955 m³/day	105 % of the rated capacity
Total Treated Water Produced in 2019	112,259 m ³	

The maximum treated flow of 995 m³/day occurred on December 18th when filling the water tower after it was drained for maintenance. The plant is allowed to temporarily exceed its maximum daily volume for the purposes of fighting a large fire or for the maintenance of the drinking water system.

CONCLUSION

The Matachewan drinking water system operated well in 2019 complying with the regulatory requirements of the Safe Drinking Water Act and its Regulations and meeting the terms and conditions outlined in its site specific Drinking Water Works Permit and Municipal Drinking Water Licence.

The system failed to meet the water taking limit of its Permit to Take Water (PTTW) several days during the reporting period during a SCADA failure, high demand, tower maintenance and upgrade work.

Three (3) adverse water quality incidents (AWQIs) occurred during the reporting period when improperly disinfected water was directed to the distribution system (April 20, 2019, September 17, 2019 and October 2, 2019). These incidents were reported to the Ministry’s Spills Action Center and the Timiskaming Health Unit as required under Schedule 16 of O. Reg. 170/03.



APPENDIX A

Monthly Summary of Microbiological
Test Results

**MATACHEWAN DRINKING WATER SYSTEM
2019 SUMMARY OF MICROBIOLOGICAL TEST RESULTS**

Facility Works Number: 220003653
 Facility Owner: Municipality: Township of Matachewan
 Facility Classification: Water Distribution and Supply

RAW WATER	01/2019	02/2019	03/2019	04/2019	05/2019	06/2019	07/2019	08/2019	09/2019	10/2019	11/2019	12/2019	Total	Avg	Max	Min	
Well 1 / Total Coliform: TC - cfu/100mL																	
Count Lab	5	4	4	5	4	4	5	4	5	4	4	5	53				
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0		
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0			
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0	
Well 1 / E. Coli: EC - cfu/100mL																	
Count Lab	5	4	4	5	4	4	5	4	5	4	4	5	53				
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0		
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0			
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0	
Well 2 / Total Coliform: TC - cfu/100mL																	
Count Lab	0	0	0	1	0	0	0	0	0	3	4	4	13				
Max Lab	Well Off-line - bacteriological sampling of well started on October 16th										29	31	6			31	
Mean Lab										9.667	14.75	2		8.727			
Min Lab										0	2	0				0	
Well 2 / E. Coli: EC - cfu/100mL																	
Count Lab	0	0	0	1	0	0	0	0	0	3	4	4	13				
Max Lab	Well Off-line - bacteriological sampling of well started on October 16th										0	0	0			0	
Mean Lab										0	0	0		0			
Min Lab										0	0	0				0	

TREATED WATER	01/2019	02/2019	03/2019	04/2019	05/2019	06/2019	07/2019	08/2019	09/2019	10/2019	11/2019	12/2019	Total	Avg	Max	Min
Treated Water (POE) / Total Coliform: TC - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	5	4	4	5	53			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Treated Water (POE) / E. Coli: EC - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	5	4	4	5	53			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Treated Water (POE) / HPC - cfu/mL																
Count Lab	5	4	4	5	4	4	5	4	5	4	4	5	53			
Max Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 250	< 20	300	< 40			300	
Mean Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 58	< 12.5	< 82.5	< 16		< 20.755		
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10				< 10

DISTRIBUTION WATER	01/2019	02/2019	03/2019	04/2019	05/2019	06/2019	07/2019	08/2019	09/2019	10/2019	11/2019	12/2019	Total	Avg	Max	Min
MW-3 (Bacti) / Total Coliform: TC - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	5	4	4	5	53			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
MW-3 (Bacti) / E. Coli - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	5	4	4	5	53			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
MW-3 (Bacti) / HPC - cfu/mL																
Count Lab	2	3	2	2	2	2	3	2	2	2	2	3	27			
Max Lab	< 10	< 10	< 10	< 10	< 30	< 10	< 10	< 10	< 10	10	< 10	< 10			30	
Mean Lab	< 10	< 10	< 10	< 10	< 20	< 10	< 10	< 10	< 10	10	< 10	< 10		< 10.69		
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	10	< 10	< 10				< 10
MW-4 (Bacti) / Total Coliform: TC - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	5	4	4	5	53			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
MW-4 (Bacti) / E. Coli - cfu/100mL																
Count Lab	5	4	4	5	4	4	5	4	5	4	4	5	53			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0		0		
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
MW-4 (Bacti) / HPC - cfu/mL																
Count Lab	3	1	2	3	2	2	2	1	3	2	2	2	25			
Max Lab	< 10	< 10	< 10	< 20	< 10	< 30	< 20	< 10	< 10	< 80	< 10	< 10			80	
Mean Lab	< 10	< 10	< 10	< 13.333	< 10	< 20	< 15	< 10	< 10	< 45	< 10	< 10		< 14.231		
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10				< 10



APPENDIX B

Monthly Summary of Operational Data

**MATACHEWAN DRINKING WATER SYSTEM
2019 SUMMARY OF OPERATIONAL TEST RESULTS**

Facility Works Number: 220003653
 Facility Owner: Municipality of Matachewan
 Facility Classification: Water Distribution and Supply

RAW WATER	01/2019	02/2019	03/2019	04/2019	05/2019	06/2019	07/2019	08/2019	09/2019	10/2019	11/2019	12/2019	Total	Avg	Max	Min
Well 1 / Turbidity - NTU																
Count IH	2	1	1	2	2	2	2	2	2	2	2	1	21			
Total IH	0.503	0.377	0.36	0.596	0.565	0.415	0.323	0.385	0.74	0.84	0.533	0.43	6.067			
Max IH	0.353	0.377	0.36	0.317	0.34	0.28	0.163	0.211	0.4	0.67	0.291	0.43			0.67	
Mean IH	0.252	0.377	0.36	0.298	0.283	0.208	0.162	0.193	0.37	0.42	0.266	0.43		0.289		
Min IH	0.15	0.377	0.36	0.279	0.225	0.135	0.16	0.174	0.34	0.17	0.242	0.43				0.135
Well 2 / Turbidity - NTU																
Count IH	0	0	0	0	0	0	0	0	0	0	2	1	3			
Total IH											0.831	0.27	1.101			
Max IH	Well Off-line - bacteriological sampling of well started on October 16th; turbidity sampling started in November										0.693	0.27			0.693	
Mean IH											0.416	0.27		0.367		
Min IH											0.138	0.27				0.138

TREATED WATER	01/2019	02/2019	03/2019	04/2019	05/2019	06/2019	07/2019	08/2019	09/2019	10/2019	11/2019	12/2019	Total	Avg	Max	Min
Treated Water (POE) / CI Residual: Free (0.28 mg/L) - mg/L																
Max OL	2.371	2.606	3.239	4.367	3.732	3.867	2.369	2.541	4.791	4.79	4.786	4.794			4.79	
Mean OL	1.695	1.663	1.365	1.571	1.499	1.369	1.33	1.253	1.378	1.612	2.033	1.806		1.55		
Min OL	0.799	0.438	0.747	0.08	0.589	0.244	0.59	0.609	0	0	0.5	0.31				0

DISTRIBUTION WATER	01/2019	02/2019	03/2019	04/2019	05/2019	06/2019	07/2019	08/2019	09/2019	10/2019	11/2019	12/2019	Total	Avg	Max	Min
Residual No. 1 / CI Residual: Free - mg/L																
Count IH	10	8	8	9	9	8	10	8	9	9	8	9	105			
Total IH	12.37	11.48	9.89	10.47	9.81	8.57	8.73	7.07	6.09	9.44	9.31	13.56	116.79			
Max IH	1.41	1.7	1.71	1.4	1.32	1.34	1.19	1.08	1.03	2.15	1.44	2.2			2.2	
Mean IH	1.237	1.435	1.236	1.163	1.09	1.071	0.873	0.884	0.677	1.049	1.164	1.507		1.112		
Min IH	0.72	1.24	0.86	1	0.94	0.71	0.64	0.58	0.27	0.47	0.97	0.93				0.27
Residual No. 2 / CI Residual: Free - mg/L																
Count IH	10	8	8	9	9	8	10	8	9	9	8	9	105			
Total IH	11.62	DISTRIB	9.96	9.83	9.07	7.2	8.22	6.7	9.37	7.93	12.74	10.52	113.14			
Max IH	1.47	1.54	1.44	1.37	1.94	1.07	1.31	1.44	2.12	1.23	2.2	1.68			2.2	
Mean IH	1.162	1.248	1.245	1.092	1.008	0.9	0.822	0.838	1.041	0.881	1.593	1.169		1.078		
Min IH	0.94	0.98	1.01	0.74	0.55	0.6	0.53	0.56	0.61	0.63	0.67	0.78				0.53
Residual No. 3 / CI Residual: Free - mg/L																
Count IH	10	8	8	9	9	8	10	8	9	9	8	9	105			
Total IH	12.98	10.43	11.33	10.28	9.43	8.79	8.92	6.95	7.53	6.09	12.38	11.01	116.12			
Max IH	1.65	1.54	1.76	1.42	1.47	1.44	1.23	1.15	1.32	1.13	2.2	1.54			2.2	
Mean IH	1.298	1.304	1.416	1.142	1.048	1.099	0.892	0.869	0.837	0.677	1.548	1.223		1.106		
Min IH	0.9	1.04	1.14	0.96	0.8	0.87	0.55	0.66	0.42	0.48	0.62	0.8				0.42
Residual No. 4 / CI Residual: Free - mg/L																
Count IH	5	4	4	5	4	4	5	4	5	4	4	5	53			
Total IH	6.27	5.22	6.06	6.8	4.51	5.22	4.11	3.44	4.41	2.36	3.87	6.59	58.86			
Max IH	1.43	1.81	1.69	1.5	1.34	1.4	1.24	0.99	1.4	0.67	1.14	2.2			2.2	
Mean IH	1.254	1.305	1.515	1.36	1.128	1.305	0.822	0.86	0.882	0.59	0.968	1.318		1.111		
Min IH	1.11	0.75	1.1	1.24	0.84	1.1	0.65	0.71	0.51	0.48	0.8	0.89				0.48

NOTES:
 April 20th - the system failed to meet CT due to low chlorine from air-locked pumps (AWQI 145237).
 June 26th - low free chlorine residual of 0.24 mg/L due to pump air lock. CT calculated and passed.
 September 17th - low free chlorine residual of 0.00 mg/L when duty hypo pump did not turn on when plant was in operation (AWQI 148118).
 October 2nd - the system failed CT when the sodium hypochlorite pump failed to start causing a low chlorine incident (AWQI 148364).