MANITOUWADGE
ONTARIO · CANADA

Manitouwadge Public Works
Presents:

Manitouwadge Water Treatment Plant
Water Treatment Subsystem Class I

And

Manitouwadge Water Distribution
Water Distribution Subsystem Class I

2013

ANNUAL REPORT

Prepared by: Kirk Tourout and Paul Richard

Date: February 11, 2014

Township of Manitouwadge
Public Works Department
Manitouwadge Water Treatment Plant
Water Treatment Subsystem Class I
And
Manitouwadge Water Distribution
Water Distribution Subsystem Class I

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ANNUAL REPORT
2013
Township of Manitouwadge
Public Works Department
Manitouwadge Water Treatment Plant
Water Treatment Subsystem Class 1
and
Manitouwadge Water Distribution
Water Distribution Subsystem Class 1

1.0 INTRODUCTION

The Corporation of the Township of Manitouwadge Public Works Department operates the Manitouwadge Water Distribution System under a **Drinking Water Works Permit # 229-201** issued by the Ministry of the Environment.

The Corporation of the Township of Manitouwadge is required to produce an annual compliance report for the benefit of the Ministry of the Environment and the residents of Manitouwadge within ninety days of the end of the calendar year.

Contained in this report, you will find the water quality data and information that we are required to keep and publish, under the Ontario Drinking Water Protection Act, from January 1, 2013 to December 31, 2013 As well; we include some of our accomplishments during the year.

Appendices to this report are the summaries of the laboratory results mandated by Ontario Regulation 170/03. Parameters included are microbiological, chemical and operational, daily laboratory testing, daily on-line instrumentation readings, inorganics and organics. As well, we have attached a "Glossary of Terms" to aid you in interpreting the data presented.

While perusing these appendices please be sure to read any and all the attached footnotes remembering that not all Maximum Acceptable Concentrations or Interim Maximum Acceptable Concentrations are health related. In fact some are aesthetic or operational parameters. Remember also that the presence of any substance does "not necessarily make the water unsafe to drink".

As of November 30, 2005 our facilities are classified as a Class I Water Treatment Subsystem and a Class I Water Distribution Subsystem.

Kirk Tourout is the operator in overall responsible charge. He is currently licensed as a Class I Water Treatment Subsystem and a Class II Water Distribution and Supply Subsystem operator. Kirk is assisted by Paul Richard who is currently licensed as a Class

I Water Treatment Subsystem and a Class I Water Distribution and Supply Subsystem operator.

Our system participates as part of the Ontario Drinking Water Surveillance Program which occurs twice annually.

Our Laboratory analysis for Ontario Regulation 170/03 sampling requirements are performed by Thunder Bay Analytical a division of ALS Laboratory Group who are accredited by the Ministry of the Environment. Drinking Water Surveillance Program sampling is analyzed by the Ministry of the Environments central laboratory.

For the purpose of this report our system supplies water for a population of 2,106. The number of households connected to our system is 1,292. Households are deemed to include residential, multiple unit residential, institutional and industrial locations.

2.0 MANITOUWADGE WATER WORKS

2.1 WATER SOURCE

Have you ever really thought about where your water comes from?

Contrary to majority public opinion, our water comes from five drilled wells and not from Manitouwadge Lake. This community is blessed with an ample supply of water from an enormous aquifer located deep under the town site bounded by hills surrounding the valley where we are situated.

Water quality does not change quickly due to the depth and the size of our aquifer. The water temperature varies from 7 °C to 8.7 °C year round. Like most drilled wells, our water is extremely hard and slightly aggressive. Allowing the well water to pass through induced draught aerators, the naturally occurring hydrogen sulfides is scrubbed off, yielding a fairly consistent pH in the 7.6 to 7.9 range.

The natural colour of our water is extremely clear and its turbidity is very low. Hence, the addition of a 12% sodium hypochlorite solution used for disinfection produces extremely low levels of trihalomethanes (THMs).

2.2 HISTORY

The Manitouwadge Distribution System was first constructed in 1954 and has gone through several upgrades since.

Initially, there was one drilled well that pumped directly into the water main with no treatment. Pressure and flow were controlled by a pressure reducing valve powered by a 50 horsepower motor. It was coupled to a four cylinder engine on a right angle drive to provide water during power outages. The system was not automatic, necessitating a workman to come to start the engine, engage the drive and disengage and stop the engine

before restoring it to main power. Capacity was 30.2 L/sec (400 IGPM). Increased demand necessitated a second drilled well. Capacity increased to 60.4 L/sec (800 IGPM). Duty was divided between these two pumps. A prolonged decrease in pressure would signal the second pump to run, meeting flow and pressure demands.

In 1962, numerous water breaks revealed that our water was corroding our water mains. The solution was to construct an induced draught aerator to raise the pH of the water. This necessitated the construction of an in-ground storage tank of 55 cubic meters (12,000 IG) to receive the aerated water. Two high lift service pumps pumped the water into the water mains controlled by pressure reducing valves. The motors on the existing well pumps were reduced to 25 horsepower. The high service pumps were 50 horsepower each. One of the high service pumps was coupled to a six cylinder engine on a right angle drive. It was later upgraded to automatic operation during a power outage. However, should the reservoir run low on water, the stand-by well motor will have to be run manually.

The town continued to grow. The wells and reservoir could no longer maintain normal daily flows, forget fire flows. In 1975, a second in-ground reservoir, of 59 cubic meters (13,000 IG) capacity, was added. An additional induced draught aerator was supplied to handle the two new drilled wells, located adjacent to the Lion's Beach. A ten inch raw water main was constructed to supply the reservoirs located at the Shawinigan Place distribution centre. A 100 KW Diesel generator was installed to provide emergency power for well pumps #3 and #4. Emergency well capacity increased from 30.2 L/s (400 IGPM) to 120.6 L/sec (1,200 IGPM). A fifth drilled well was later added, in 1989. An upgrade to the sewage lift station, in 1984, saw the upgrading of diesel generator to 200 KW. However, this resulted in the emergency well pumping capacity dropping to 60.4 L/sec (800 IGPM).

Two additional high service pumps were added to bring our firm pumping capacity to 120.8 L/sec (1,600 IGPM). One of these pumps was connected to a motor driven right angle drive, boosting our emergency pumping capacity to 60.4 L/sec (800 IGPM).

By 1984, the inadequacy of our water supply became apparent. Consistent failure of the emergency pumping systems, and the age of the equipment and its operating systems, prompted a detailed study.

The Hemlo Gold find prompted the final 1990 expansion of our water distribution system. A 4,065 cubic meter (893, 000 IG) two-celled reservoir was constructed. Two dedicated fire pumps were added and the existing high service pumps were upgraded to 40.5 L/sec (525 IGPM). Firm pumping capacity was increased to 243 L/sec (3,200 IGPM).

A 400 KW generator was installed to provide emergency power for the entire Shawinigan Place facility. However, our assured well pumping capacity is only 60.4 L/sec (800 IGPM).

In the spring of 2004 the oil lubricated vertical turbines for Well Pumps #1, #2, #3 and #4 were replaced with submersible water lubricated units. The reasons for the upgrade were prompted by Ministry of the Environment Inspectors preference for water lubricated units to eliminate the need for oil. The oil used was of food grade quality; therefore meaning that there was no risk to human health should the well pump break suction. The decision was made on operational basis determined by the relative ease of servicing locally rather than contracting out maintenance services to a specialist well contractor.

Our Facilities can service the peak pumping hours, plus fire flows, for a population of 6,000 people.

As of May 10th, 2007 a secondary source of treatment was implemented for the Town Of Manitouwadge consisting of 3 UV reactors which were installed in the pumping stations. The UV reactors are posing as an initial treatment used to inactivate pathogens using 254 nm spectrum of light before receiving a secondary treatment of disinfection as stated above. These reactors are designed to achieve maximum inactivation at a minimum dosage rate of 42 mJ/cm^2. This dosage rate will supply sufficient inactivation to specific micro organisms passing through the light spectrum. Inactivation consists of a physical process which fuses the DNA of the microorganism rendering it incapable of replication.

Over the past three years Jon Nelson of Nelson Technical Services has been implementing a change in method of which the control of the water plant is conducted. As of the end of 2011 the water treatment plant is now controlled using SCADA (Supervisory Control And Data Acquisition) System. The SCADA System is a visual control system which allows operators to see changes made to the processes in real time. The SCADA system has various pages for viewing which include System overview, Service pumps, Well pumps, System settings, and Alarm History, Analog Inputs, and pump hour meters.

The System Overview is exactly that, an overview of all the service pumps, well pumps, reservoir and UV system and what is running in real time. The Service pump page indicates what service pump is supplying the distribution system as well this page allows you to select service pumps and run them manually. The well pump page indicates which well pump is selected, and allows operators to run well pumps manually. System settings page is where all the settings are located and allows operators to view and change set points for the reservoir, Selection for lead service pumps and lead well pumps. Also the system settings page allows operators to view alarm set points. Alarm History page is just accumulation of alarms that have previously happened. (i.e. Pump Failure or UV Failure). The Analog page is a visual indication of all the input readouts. (i.e. CL2, Turbidity, Temp, etc.). Pump hour meter page allows operators to visually see how many hours are on each pump indicates to operators which pump need to be ran to have even runtime and distribute the everyday wear and tear on the pumps. In the near future Jon Nelson will commission the Daily Reporting page which will allow operators to print out daily reports on a regular basis.

The SCADA System also has trending pages which allow operators to visually look at graphs and see anomalies in the data, whether it be in five minute intervals up to weekly or monthly intervals. This feature is good as you can pinpoint the timeframe then go back to the actual data and identify the numbers associated with the anomalies.

During the fall of 2013 we had a catastrophic failure of the 200 KW generator that supplies emergency power to well 3, 4 pumping station along with the sewage lift station facility. The 200 KW generator was replaced with a 300 KW unit to allow for greater capacity in emergency situations. A building was constructed in the lift station compound and the new generator relocated.

During the fall of 2013 Lotowater Technical Services Inc. was hired to complete a service program at well #1 and #5. Work involved the chemical rehabilitation of Well #1 screen and mechanical rehabilitation #5 screen to increase recovery rates. Well #1 pump was replaced and original equipment sent out for service to be used as replacement equipment. Well #5 oil lubricated line shaft pump was also replaced with a submersible pump.

2.3 OPERATIONS

System pressure controls the operation of six (6) high power pumps. The lead pump is controlled by a variable frequency driver. The VFD increases the lead pump's speed to maintain system pressure until the maximum motor speed is reached. As demand increases and as the system pressure drops to and remains 2.5 to 5.0 PSI below the system pressure set point (currently 80 PSI) for twenty (20) seconds, a second high service pump is called at constant (maximum speed, and then starts following a five (5) second time delay. The lead pump's speed is adjusted by the VFD to compensate and maintain the system pressure at its set point.

As system demand increases further, the lead pumps speed increases to maximum, and when the system pressure set point drops 2.5 to 5 PSI for a twenty (20) second period, a second high service pump at constant speed is called and then starts after a five (5) second time delay.

2.4 DECREASING DEMAND

The lead pump decreases its speed via the VFD to maintain system pressure until the minimum speed is attained. As demand decreases and the system pressure rises and remains 2.5 to 5 PSI above the set point for a period of ten (10) seconds, a high service pump at a constant speed is stopped. The VFD adjusts the lead pumps to compensate and maintain the system pressure set point.

2.5 WELL PUMPS

Reservoir levels control the operation of five (5) well pumps. When the reservoir level falls to the start level for duty one, the pump assigned to duty one will start and continue to run until the reservoir level rises to the stop level programmed for the duty one. In a similar manner, their remaining pumps will start or stop in accordance with their programmed start and stop levels when reached according to the well pump duty cycle for duties two (2) to five (5).

Up until the end of 2011 well pump Flow (Q) was controlled by throttling valves to achieve the desired flow on the flow meter. As of the end of December 2011 Automation Now and Nelson Technical Services installed five 25 hp VFD's on each of the well pumps, which allowed us to open up the valves and control the speed of the pump using the VFD's to achieve the desired flow on the flow meters. The addition of the VFD control benefits the plant in a variety of ways, not only is the wear and tear on the pumps valves and piping minimized but we are also running the well pumps more efficiently. The installation of the VFD's on the well pumps boasted approximately a 45 % reduction in energy usage just by controlling the speed of the pump rather than throttling the valves.

2.6 PUMP SETUP

Within the system, there were two (2) variable frequency drivers, six (6) high service lift pumps and five (5) well pumps. As of the end of December Automation Now and Nelson Technical Services installed an additional two (2) VFD's on the service pumps which supply the town's water through the distribution system. The operator now selects which pump is the going to be the lead pump with the option of selection two service pumps as the lead pumps. After pump selection is achieved automatically the VFD that is hooked up to that service pump will run to maintain the desired pressure in the distribution system. Lead pumps are cycled to achieve an equal run time.

The operator selects from service pumps 1 to 4 the lead pump. High service pumps #5 and #6 can never be selected as lead pumps. Pump # 5 becomes the automatic selection when you select service pump #1 or #2 and Pump #6 becomes the automatic selection when service pump #3 or #4 is selected. Also another feature that was put in place is if the power fails and the PLC dumps and we loose control a service pump will run on minimum speed to insure that the pressure in the distribution system doesn't drop until we can get the PLC repaired.

The operator selects from well pumps 1 to 5 the lead well pump. The balance of the pumps becomes duties 2 to 5. As with the VFD's and the high service pumps, care is taken to run each well pump on a regular basis to equally distribute the wear and tear of the regular operations.

3.0 WATER QUALITY

Some parameters may be present in source water before we treat it. Here is description of the various groups of parameters.

Microbiological Parameters, such as bacteria, may come from sewage plants, livestock operations, septic systems and wildlife. Microbiological quality is the most important aspect of the drinking water quality because of its association with dangerous water-borne disease which can strike quickly.

Inorganic Parameters, such as salts and metals, can be naturally occurring, or a result of urban storm runoff, industrial or domestic wastewater discharge, mining or agriculture. Some may be a result of treatment and distribution of water (for example, lead from old solder in pipes).

Organic Parameters can be naturally occurring, but most organics of concern are synthetic. They originate from industrial discharges, urban storm runoff and other sources. Included in this group are pesticides that originate from both, rural and urban areas. Some may originate from treatment of drinking water (for example, chlorination byproducts such at trihalomethanes).

4.0 SOME WATER FACTS

4.1 DATA

See Appendix A for the relevant flow data.

Appendix A-1 shows the sodium hypochlorite and chlorine usage and the average daily dosage rate.

Appendix A-2 summarizes the total monthly flows juxtaposed with the average, minimum and maximum for actual flows and peak daily flows.

Appendix A-3 features a summary of the minimum and maximum daily flows on a monthly basis highlighting the day that they occurred.

Appendix A-4 in accordance with our Certificate Of Approval features a summary of the minimum and the maximum daily flows on a monthly basis also highlighting the day that they occurred. Please note that these flows are calculated using the peak flow for that day extrapolated to a daily flow. They are **not** actual daily flows.

Appendix A-5 shows an annual overview of the actual daily flows.

Appendix A-6 is an annual summary of maximum instantaneous daily flows.

Appendix A-7 annually summarizes the minimum instantaneous daily flows.

Our Treatment Plant delivered 325,271,000 liters of potable water to its consumers 6,051 liters of 12% sodium hypochlorite solution yielding 848.11 kilograms of chlorine used for disinfection purposes. This translates to an annual dosage rate of 2.66 mg/L.

On a per capita basis this translated to 423 liters per person per day. Based on the 2012 figure of 394 liters per person per day this represents a 7.4 % increase in water consumption per person per day.

On a household basis this means that 689 liters per household per day were consumed. Based on the 2012 figure of 642 liters per household per day, this represents a 7.3 % increase in consumption levels.

4.2 Water Metering

Completion of the water meter installations in April 2005 prompted the creation of Figure 4.2. It shows the percentage decrease in water consumption commensurate with the billing for the water usage.

Fig 4.2					
	2012		2013		
Month	Total Flow	Average Daily Flow	Total Flow	Average Daily Flow	Reduction
	m^3	m^3	m^3	m^3	%
January	30137	969.48	30807	993.80	2.22
February	29730	1026.46	28813	1029.06	-3.08
March	27026	869.32	33582	1083.30	24.26
April	25312	839.03	33375	1112.50	31.85
May	28643	919	31958	1030.91	11.57
June	32100	1062.57	26711	890.40	-16.79
July	28712	922.13	29372	947.49	2.30
August	23567	759.06	27124	874.97	15.09
September	19856	657.43	21581	719.37	8.69
October	18354	592.06	18713	603.66	1.96
November	17736	632.7	19882	662.74	1.12
December	21800	701.35	23349	753.21	7.10
Total/Average	**302973**	**829.22**	**325271**	**891.15**	7.19

*** When there is a (-) % that is actually a decrease from previous year and when the there is no (–) sign that indicates an increase from the previous year. Even though there were increases in some months the overall reduction is based on the annual comparison.

5.0 COMPLIANCE ISSUES

5.1 SAMPLING

Appendix B-1 gives a summary of the laboratory analysis for Ontario Regulation 170/03 annual sampling requirements for inorganics. There was one exceedence.

Appendix B-2 gives a summary of the laboratory analysis for Ontario Regulation 170/03 annual sampling requirements for organics. There were no exceedences.

Appendix B-3 gives a summary of the laboratory analysis for Ontario Regulation 170/03 quarterly sampling requirements for organics. There were no exceedences.

Appendix B-4 and B-5 gives a summary of the laboratory analysis performed under the auspices of the Ontario Drinking Water Surveillance Program. B4-a and B4-b deal with various chemical, physical and operational parameters. B4-deals specifically with raw water and B4-b deals with treated water. There was one exceedence for Hardness. Please pay close attention to the footnotes provided.

B5-a and B5-b deal with various inorganic parameters. B5-a deals specifically with raw water and B5-b deals with treated water. There were some exceedences. Please pay careful attention to the footnotes.

Appendix C-1 details a summary of our weekly raw water bacteriological sampling requirements under Ontario Regulation170/03. There were no exceedences.

Appendix C-2 details a summary of our weekly treated water bacteriological sampling requirements under Ontario Regulation170/03. There were no exceedences.

Appendix C-3 summarizes our weekly bacteriological sampling requirements for the distribution system under Ontario Regulation170/03. There were no exceedences.

5.2 Peak Flows

Under our Certificate of Approval we are required to monitor our instantaneous maximum daily flow and translate this into a daily flow also known as a "Peak Flow". This figure should not exceed our Maximum Allowable Daily Flow of 10, 472 m3/day. Any flows in excess of this must be documented together with a reason for the exceedence.

For 2013 there were Three (3) such exceedences. Figure 5.2 represents this exceedence with a brief explanation for the occurrence.

Figure 5.2

Peak Flow Exceedences		
Day/Date	**Flow (m^3/day)**	**Probable Causes**
Monday, July 15th, 2013	10,593.50	OCWA Annual Watermain Swabbing
Tuesday, Aug 27th, 2013	10,964.16	Hydrant Flushing
Tuesday, Sept 03th, 2013	21,600.00	Erroneous Reading due to Meter Calibration

6.0 CERTIFICATE OF APPROVAL

6.1 DAILY LABORATORY TESTING AND OPERATIONAL PARAMETERS

Appendix D-1 summarizes our Certificate of Approval mandated daily in-house laboratory testing for various operational parameters and distribution system zone sampling. To address a request by the Ministry Of Environment Inspector that our results mirror the M.O.E. form III reporting this appendix goes from 1a to 1g. Included in these results as requested by the M.O.E. are the Raw Well Turbidity readings which are analyzed for once a month and recorded in a spread sheet.

Appendix D-2 summarizes our Certificate of Approval mandated On-Line Instrumentation As per M.O.E. request to mirror form III reporting this appendix goes from 2a to 2d. There were no exceedences.

Our On-Line instrumentation and our Laboratory analyzers were re-calibrated by Andre Lemoine who is a Clear Tech technician on July 13th, 2013.

6.2 FLOW METERING

Our Certificate of Approval mandates that our flow meters must be accurate within plus or minus five (5%) percent of the raw water and treated water flow meters.

Appendices E1 to E13 sets out the accumulated data for January through December. Appendix E1 is a summary of the monthly totals of Appendices E2 to E13. This shows that for the period represented by this data that is an average we were in compliance.

However, as you pursue this data you may notice that some daily and some monthly figures seem to be out of compliance. The explanation for this is as follows:
The well flow meters are the most accurate and these flows are used to compute the daily flows. Each well is restricted to 30.3 liters per second and the corresponding meter is set accordingly. The raw water flow meter to achieve the maximum accuracy is programmed to accurately measure flows up to 91.2 liters per second which represents the combined flow of three wells. When more than three wells are running such as during hot days or major water break or fire hydrant usage the accuracy falls off.

Similarly the treated water meter is programmed to be accurate with flows not exceeding 120 liters per second. This represents the maximum flow at 80 psi that three of our six high service pumps can produce. During high flow conditions such as hot weather demand, major water breaks or fire hydrant usage when more that three high service pumps are required the accuracy again falls off.

Please realize that the accuracy of the flow metering equipment is monitored on a daily basis by our operations personnel. The well flow meter and hour meter, raw water meter and treated water meter are read daily. Hour meter readings are subtracted from the previous days reading and multiplied by the well meter flow usual 108 cubic meters per day and compared with difference in the flow meter reading to ensure that it is within plus or minus five percent of each other. The results of the five wells are then added and then compared with the differences for the raw water and treated water flow meters.

Our flow meters were re-calibrated by Endress + Hauser on September 03, 2013.

6.3 LEAD SAMPLING PROGRAM

In spring 2008 M.O.E mandated that lead sampling be conducted in accordance with OR 170-03 Community Lead sampling. Lead Sampling was to commence twice annually during the spring and again in the fall. Due to sample results not exceeding the 10 ug/L limit the Township of Manitouwadge will be exempt from lead sampling for a duration of 3 years. The lead sampling program will recommence in 2016.

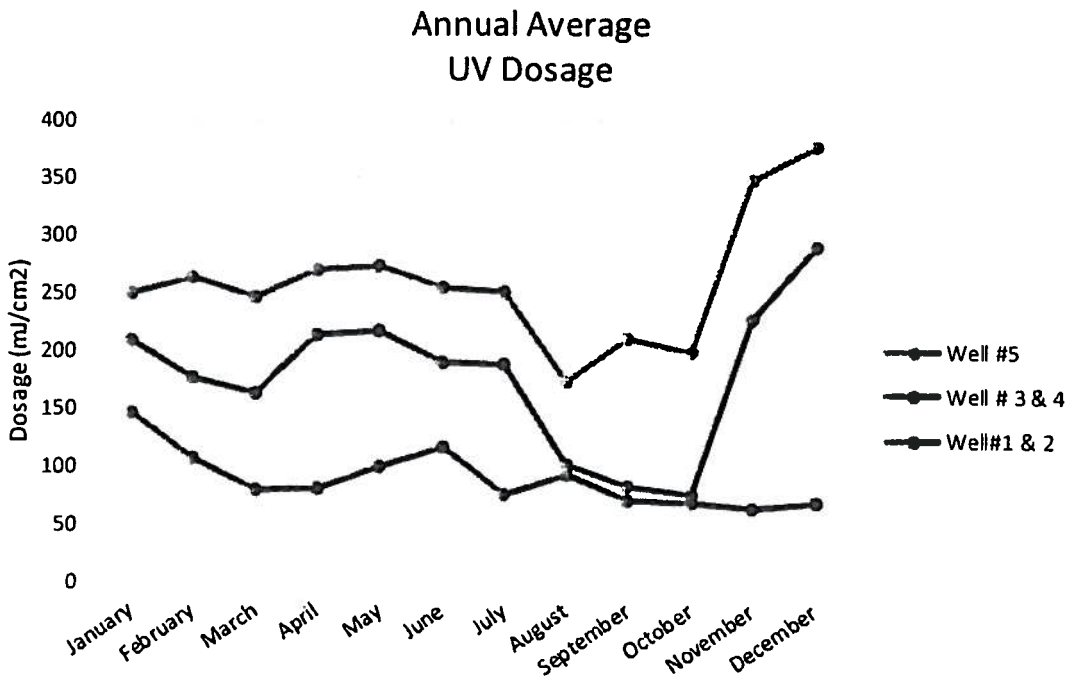
6.4 UV Treatment Operations & Data

This section was a result of the installation of the three (3) UV Reactors one for each of the pump houses. The data was averaged out on a monthly basis and the data was input into tabular format as well as a graph was plotted to show the average monthly comparison of each of the reactors. See below figure 6.4a and 6.4b.

Figure 6.4 a

2013	Well 1 & 2 Average Dosage	Well 3 & 4 Average Dosage	Well 5 Average Dosage
	mJ/cm^2	mJ/cm^2	mJ/cm^2
January	145	64	41
February	107	70	86
March	79	83	84
April	80	133	57
May	99	118	57
June	116	74	64
July	76	112	64
August	92	10	71
September	70	12	129
October	69	6	124
November	64	163	121
December	69	221	88
Average	89	89	82

Figure 6.4 b



**Average dosage reading was calculated based n all the data provided. This means that even when the unit wasn't running it was logging a zero reading. Therefore the dosages that yielded a low average result is a result of all the zeros in the calculation as well as the frequency of well run time. Run time increases when the well is selected by the lead pump.

7.0 MINISTRY ORDERS

1. Review of the 2012 M.O.E Drinking water Inspection report revealed that no orders were issued.

8.0 CONCLUSION

The Township had an extremely busy 2013.

1. The Township had contracted out to the Ontario Clean Water Agency (O.C.W.A.) the third of a three year swabbing plan. O.C.W.A. in accordance with the Township of Manitouwadge swabbed pipes in Zone #3 which was completed over a three day process which consisted of 39.5 regular man hours and 5 overtime man hours.

2. During the Swabbing program Water Operators also conducted the valve exercising program which insured smooth operation during the swabbing program. The valve exercising program allowed operators to identify and repair deficiencies in the distribution system.

3. During the fall of 2013 Lotowater Technical Services Inc. was hired to complete a service program at well #1 and #5.

a. On September 17, 2013 a single rate well performance test was completed on Well #1. The performance test indicated that Well #1 was currently at 10% of the as-constructed level. A pre-rehabilitation video was then completed which indicated severe biological fouling of the well screen. The rehabilitation of Well #1 involved brushing, surging and air lifting followed by the treatment of an acid polymer solution and finally air lifting of the well until clear water was being produced. The pump and motor was then replaced and the original equipment was sent to be service to be used as replacement equipment. On September 20, 2013 the well performance test was once again conducted. The results showed performance is currently above as constructed levels.

b. On September 19, 2013 a single rate well performance test was completed on Well #5. The performance test indicated that Well #5 performance has not changed significantly since construction. A pre-rehabilitation video was then completed which indicated severe biological fouling of the well screen. The rehabilitation of Well #5 involved the mechanical cleaning of the well screen and the video completed prior to cleaning indicated successful removal of fouling from the well screen. Well #5 oil lubricated line shaft pump was then replaced with a submersible pump.

4. As assessment of the main distribution pump house roof located at Shawinigan Place Holmes Roofing and Sheet Metal indicated that a complete resurfacing was required. Work commenced on October 30, 2013 and completed on November 12, 2013. Holmes Roofing is to return in 2014 to complete the flashing on the pump house roof.

5. During the fall of 2013 we had a catastrophic failure of the 200 KW generator that supplies emergency power to well 3, 4 pumping station along with the sewage lift station facility. Due to age the 200 KW generator it was deemed unrepairable. The 200 KW generator was replaced with a 300 KW mobile unit supplied by GAL Power. This would now allow for greater pumping capacity in emergency situations. The previous generator location was not suitable for the 300 KW and a new building was constructed in the lift station compound and the new generator relocated.

6. The Township public works department spent 411.5 regular man hours, 32.5 overtime hours and 3.5 double time hours on water service repairs.

7. The Township public works department spent 289.5 regular man hours, 67.5 overtime hours and 1 double time hour on water main repairs.

8. The Township public works department spent 25 regular man hours on steaming fire hydrants.

9. The Township public works department spent 63 regular man hours and 1.5 overtime hours on water service disconnections.

10. The Township public works department spent 51 regular man hours on water service reconnections.

11. The Township public works department spent 56 regular man hours on water meter repairs.

12. The Township public works department spent 35.5 regular man hours and 0.5 overtime hours on water meter readings

13. The Township public works department spent 36.5 regular man hours and 15 overtime hours on frozen water lines.

14. The Township public works department spent 32 regular man hours and 4 overtime hours on swabbing water mains

15. The Township public works department spent 15.5 regular man hours and 1 overtime hour on valve exercising.

RECOMMENDATIONS

1. Completion of the roof at the main pumphouse.
2. Cleaning of the reservoir.
3. Data acquisition and daily report capabilities from SCADA system.
4. Completion of rehabilitation program on wells 2, 3 and 4.

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2013
SUMMARY OF
SODIUM HYPOCHLORITE USAGE

Appendix A-1

Month	12% Sodium Hypochlorite Solution	Chlorine	Dosage Rate
	Liters (L)	Kilograms (kg)	mg/L
January	513	71.83	2.39
February	512	71.69	2.53
March	561	78.56	2.36
April	564	78.98	2.38
May	562	78.70	2.46
June	488	68.40	2.56
July	562	78.77	2.68
August	516	72.25	2.64
September	470	65.88	3.07
October	398	55.71	2.96
November	422	59.08	3.02
December	487	68.26	2.89
ANNUAL	6,051	848.11	2.66

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SUMMARY OF MONTHLY ACTUAL AND PEAK FLOWS

APPENDIX A-2

Total Flow (m^3)	Actual Daily Flows (m^3/Day)			Month	Peak Daily Flows (m^3/Day)			Exceedence
	Average	Minimum	Maximum		Average	Minimum	Maximum	
30,807.74	993.80	701.85	2,063.93	January	1,212.84	0.00	7,495.20	N
28,813.68	1,029.06	864.41	1,425.07	February	1,137.53	430.27	2,163.46	N
33,582.44	1,083.30	909.16	1,468.36	March	1,205.36	492.48	2,308.61	N
33,375.05	1,112.50	958.50	1,292.86	April	1,347.51	0.00	9,011.52	N
31,958.27	1,030.91	798.59	1,211.21	May	1,182.18	3.46	4,973.18	N
26,711.95	890.40	674.16	1,091.97	June	1,155.43	0.00	6,487.79	N
29,372.19	947.49	724.37	1,830.78	July	1,566.64	0.00	10,593.50	Y
27,124.04	874.97	491.48	1,527.30	August	1,345.66	1.73	10,964.16	Y
21,581.03	719.37	462.32	876.06	September	1,287.92	0.00	21,600.00	Y
18,713.39	603.66	492.33	687.42	October	1,002.37	0.00	7,517.66	N
19,882.17	662.74	519.53	793.79	November	1,002.99	3.46	7,717.25	N
23,349.38	753.21	294.62	1,450.23	December	947.20	16.42	3,961.44	N
325,271.33	891.15	294.62	2,063.93	Annual	1,199.47	0.00	21,600.00	Y

[1] Under our Certificate of Approval our Maximum Allowable Daily flow is 10,472 m^3/Day. Any time the instantaneous Peak Flow exceeds 10,472 m3/Day a note must be made of the circumstances that created the flow.

ANNUAL REPORT
2013
SUMMARY OF MONTHLY
MAXIMUM AND MINIMUM DAILY PEAK FLOW EVENTS

Appendix A-3

Minimum Daily Flow m^3	Day	Date	Month	Day	Date	Maximum Daily Flow m^3
660.98	Tuesday	7th	January	Wednesday	22nd	1,993.65
835.59	Friday	1st	February	Sunday	24th	1,304.44
880.24	Tuesday	12th	March	Sunday	17th	1,461.83
942.61	Monday	15th	April	Saturday	27th	1,253.47
772.38	Thursday	23rd	May	Monday	6th	1,194.89
777.48	Sunday	16th	June	Tuesday	25th	1,022.13
710.54	Sunday	7th	July	Tuesday	16th	1,824.72
625.46	Saturday	31st	August	Sunday	18th	1,503.59
461.88	Sunday	29th	September	Thursday	12th	892.65
462.86	Monday	7th	October	Monday	28th	708.05
523.00	Monday	18th	November	Sunday	10th	839.75
598.41	Friday	13th	December	Wednesday	18th	1,482.03
461.88			Annual			1,993.65

ANNUAL REPORT
2013
SUMMARY OF MONTHLY
MAXIMUM AND MINIMUM ISTANTANEOUS DAILY PEAK FLOW EVENTS

Appendix A-4

Minimum Daily Flow m^3	Day	Date	Month	Day	Date	Maximum Daily Flow m^3
0.00	Friday	18th	January	Thursday	17th	7,495.20
430.27	Friday	1st	February	Saturday	23rd	2,163.46
492.48	Friday	8th	March	Friday	22nd	2,308.61
0.00	Tuesday	30th	April	Thursday	4th	9,011.52
3.46	Monday	13th	May	Thursday	30th	4,973.18
0.00	Thursday	27th	June	Monday	24th	6,487.79
0.00	Monday,Saturday,Monday	8th,27th,29th	July	Monday	15th	10,593.50
1.73	Tuesday	13th	August	Tuesday	27th	10,964.16
0.00	Tuesday	3rd	September	Tuesday	3rd	21,600.00
0.00	Friday	4th	October	Wednesday	16th	7,517.66
3.46	Monday	4th	November	Monday	4th	7,717.25
16.42	Saturday	7th	December	Thursday	19th	3,961.44
0.00			Annual			21,600.00

ANNUAL PERFORMANCE REPORT

2013

DAILY WATER FLOW

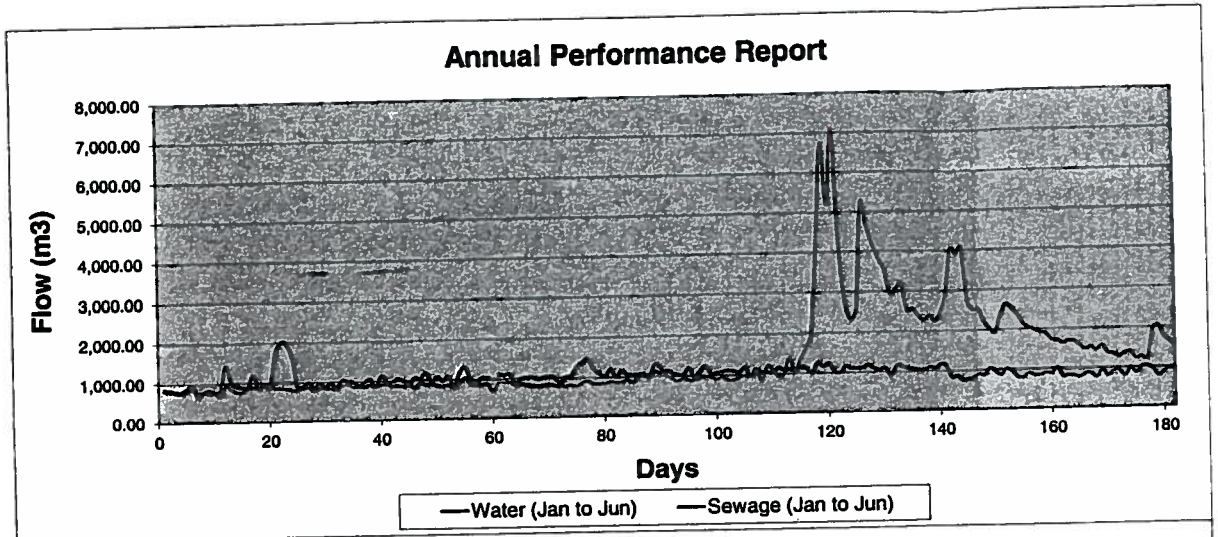
Appendix A-5

	January			February			March			April			May			June			July			August			September			October			November			December
1	Wed	829.05	1	Fri	835.59	1	Fri	1112.57	1	Mon	1074.99	1	Wed	1013.45	1	Sat	959.03	1	Mon	1041.55	1	Thu	908.40	1	Sun	620.98	1	Tue	524.56	1	Fri	754.05	1	Sun	683.04
2	Thu	822.57	2	Sat	1041.98	2	Sat	1096.52	2	Tue	1035.98	2	Thu	1176.74	2	Sun	808.85	2	Tue	1030.15	2	Fri	956.82	2	Mon	732.39	2	Wed	553.46	2	Sat	704.75	2	Mon	708.43
3	Fri	774.37	3	Sun	1009.00	3	Sun	1095.00	3	Wed	1037.70	3	Fri	1121.42	3	Mon	797.68	3	Wed	1161.87	3	Sat	916.45	3	Tue	777.11	3	Thu	556.85	3	Sun	726.37	3	Tue	627.69
4	Sat	748.96	4	Mon	998.78	4	Mon	895.33	4	Thu	1206.49	4	Sat	1109.70	4	Tue	902.14	4	Thu	1058.05	4	Sun	855.28	4	Wed	711.50	4	Fri	575.68	4	Mon	618.15	4	Wed	752.96
5	Sun	834.67	5	Tue	907.15	5	Tue	1000.41	5	Fri	953.61	5	Sun	1134.97	5	Wed	849.54	5	Fri	853.23	5	Mon	897.61	5	Thu	729.09	5	Sat	523.62	5	Tue	723.90	5	Thu	673.33
6	Mon	970.85	6	Wed	985.89	6	Wed	1017.94	6	Sat	1112.10	6	Mon	1194.89	6	Thu	849.96	6	Sat	838.68	6	Tue	887.29	6	Fri	633.61	6	Sun	641.53	6	Wed	577.48	6	Fri	787.44
7	Tue	660.98	7	Thu	1067.11	7	Thu	1028.71	7	Sun	1227.11	7	Tue	1107.48	7	Fri	909.95	7	Sun	710.54	7	Wed	959.80	7	Sat	699.08	7	Mon	462.86	7	Thu	659.12	7	Sat	660.12
8	Wed	783.21	8	Fri	855.06	8	Fri	987.11	8	Mon	1040.33	8	Wed	1057.53	8	Sat	890.11	8	Mon	842.76	8	Thu	897.26	8	Sun	765.07	8	Tue	569.25	8	Fri	739.01	8	Sun	780.40
9	Thu	836.00	9	Sat	1136.05	9	Sat	1008.53	9	Tue	1068.89	9	Thu	1105.04	9	Sun	1019.59	9	Tue	729.48	9	Fri	985.12	9	Mon	779.16	9	Wed	569.76	9	Sat	644.45	9	Mon	658.51
10	Fri	765.98	10	Sun	986.71	10	Sun	1038.04	10	Wed	1096.77	10	Fri	910.68	10	Mon	811.36	10	Wed	717.60	10	Sat	925.07	10	Tue	657.08	10	Thu	569.64	10	Sun	839.75	10	Tue	747.56
11	Sat	681.39	11	Mon	981.91	11	Mon	1012.83	11	Thu	1122.95	11	Sat	1160.33	11	Tue	835.38	11	Thu	826.56	11	Sun	905.57	11	Wed	688.99	11	Fri	632.51	11	Mon	613.22	11	Wed	665.13
12	Sun	946.65	12	Tue	1063.53	12	Tue	880.24	12	Fri	1101.09	12	Sun	1139.48	12	Wed	819.71	12	Fri	769.71	12	Mon	905.62	12	Thu	892.65	12	Sat	689.11	12	Tue	680.31	12	Thu	799.34
13	Mon	841.44	13	Wed	993.85	13	Wed	1012.62	13	Sat	1079.50	13	Mon	1088.48	13	Thu	785.65	13	Sat	787.80	13	Tue	871.44	13	Fri	833.44	13	Sun	569.33	13	Wed	712.31	13	Fri	598.41
14	Tue	774.19	14	Thu	925.30	14	Thu	1039.35	14	Sun	1189.67	14	Tue	1066.89	14	Fri	876.31	14	Sun	806.68	14	Wed	913.40	14	Sat	811.75	14	Mon	707.58	14	Thu	632.68	14	Sat	758.26
15	Wed	782.46	15	Fri	1066.78	15	Fri	1266.97	15	Mon	942.61	15	Wed	1045.96	15	Sat	874.36	15	Mon	1507.82	15	Thu	915.95	15	Sun	789.49	15	Tue	588.74	15	Fri	551.75	15	Sun	872.56
16	Thu	885.16	16	Sat	1044.34	16	Sat	1375.47	16	Tue	1121.97	16	Thu	1055.51	16	Sun	777.48	16	Tue	1624.72	16	Fri	843.61	16	Mon	767.00	16	Wed	561.26	16	Sat	588.60	16	Mon	672.81
17	Fri	1,180.31	17	Sun	1182.65	17	Sun	1461.83	17	Wed	1087.55	17	Fri	1109.35	17	Mon	955.01	17	Wed	1598.23	17	Sat	950.53	17	Tue	897.32	17	Thu	567.89	17	Sun	743.93	17	Tue	820.68
18	Sat	844.08	18	Mon	971.00	18	Mon	1221.36	18	Thu	1056.39	18	Sat	1082.74	18	Tue	809.38	18	Thu	844.79	18	Sun	1503.59	18	Wed	661.17	18	Fri	611.82	18	Mon	523.00	18	Wed	1482.03
19	Sun	947.24	19	Tue	1085.65	19	Tue	1105.09	19	Fri	1047.92	19	Sun	1181.37	19	Wed	922.67	19	Fri	849.29	19	Mon	871.43	19	Thu	884.32	19	Sat	653.54	19	Tue	686.12	19	Thu	644.33
20	Mon	862.82	20	Wed	975.82	20	Wed	1027.87	20	Sat	1166.38	20	Mon	1134.23	20	Thu	932.92	20	Sat	774.55	20	Tue	969.02	20	Fri	840.13	20	Sun	620.25	20	Wed	558.32	20	Fri	766.32
21	Tue	1,740.30	21	Thu	1103.16	21	Thu	1209.15	21	Sun	1098.69	21	Tue	854.45	21	Fri	797.81	21	Sun	941.39	21	Wed	871.65	21	Sat	877.00	21	Mon	577.61	21	Thu	558.79	21	Sat	843.00
22	Wed	1,993.65	22	Fri	842.42	22	Fri	1011.35	22	Mon	1105.08	22	Wed	868.90	22	Sat	968.82	22	Mon	759.77	22	Thu	857.71	22	Sun	725.14	22	Tue	572.94	22	Fri	668.67	22	Sun	694.88
23	Thu	1,952.78	23	Sat	1171.73	23	Sat	1165.01	23	Tue	1101.21	23	Thu	772.38	23	Sun	873.09	23	Tue	890.23	23	Fri	707.41	23	Mon	711.66	23	Wed	656.05	23	Sat	672.84	23	Mon	784.04
24	Fri	1,845.17	24	Sun	1304.44	24	Sun	1056.51	24	Wed	1169.26	24	Fri	785.65	24	Mon	1019.97	24	Wed	882.38	24	Sat	861.49	24	Tue	657.29	24	Thu	592.60	24	Sun	620.15	24	Tue	832.48
25	Sat	876.60	25	Mon	1005.06	25	Mon	1049.63	25	Thu	1131.57	25	Sat	825.90	25	Tue	1022.13	25	Thu	795.94	25	Sun	834.96	25	Wed	607.94	25	Fri	534.93	25	Mon	679.25	25	Wed	685.25
26	Sun	889.57	26	Tue	939.70	26	Tue	1083.92	26	Fri	1003.19	26	Sun	904.26	26	Wed	954.97	26	Fri	885.56	26	Mon	866.00	26	Thu	594.41	26	Sat	631.58	26	Tue	562.44	26	Thu	706.90
27	Mon	997.32	27	Wed	1040.36	27	Wed	1076.35	27	Sat	1253.47	27	Mon	893.88	27	Thu	791.08	27	Sat	819.56	27	Tue	747.45	27	Fri	599.53	27	Sun	704.29	27	Wed	638.48	27	Fri	757.29
28	Tue	841.88	28	Thu	1032.37	28	Thu	965.36	28	Sun	1175.84	28	Tue	1034.17	28	Fri	908.36	28	Sun	1053.31	28	Wed	830.27	28	Sat	658.63	28	Mon	708.05	28	Thu	691.96	28	Sat	884.77
29	Wed	973.87				29	Fri	1124.93	29	Mon	1250.21	29	Wed	962.99	29	Sat	973.03	29	Mon	807.31	29	Thu	661.45	29	Sun	461.88	29	Tue	575.47	29	Fri	603.94	29	Sun	686.71
30	Thu	850.62				30	Sat	1083.23	30	Tue	1033.00	30	Thu	875.09	30	Sun	939.17	30	Tue	907.43	30	Fri	708.46	30	Mon	613.13	30	Wed	592.67	30	Sat	697.69	30	Mon	728.69
31	tue	987.18				31	Sun	1141.26				31	Fri	1007.96				31	Wed	876.45	31	Sat	625.46				31	Thu	690.61				31	Tue	795.13
		30521.51			28553.2			33630.48			33071.50			31781.83			28655.51			29171.38			27411.57			21277.94			18588.21			19671.48			23556.48
	ADF	984.56		ADF	1019.76		ADF	1084.85		ADF	1102.38		ADF	1025.22		ADF	888.52		ADF	941.01		ADF	884.24		ADF	709.28		ADF	599.62		ADF	655.72		ADF	759.95
	NHI (L)	513		NHI (L)	512		NHI (L)	561		NHI (L)	564		NHI (L)	562		NHI (L)	488		NHI (L)	562		NHI (L)	516		NHI (L)	470		NHI (L)	398		NHI (L)	422		NHI (L)	487
	Cl_2 (kg)	71.83		Cl_2 (kg)	71.69		Cl_2 (kg)	78.56		Cl_2 (kg)	78.98		Cl_2 (kg)	78.70		Cl_2 (kg)	68.40		Cl_2 (kg)	78.77		Cl_2 (kg)	72.25		Cl_2 (kg)	65.88		Cl_2 (kg)	55.71		Cl_2 (kg)	59.08		Cl_2 (kg)	68.26
	DOSAGE (mg/L)	2.39		DOSAGE (mg/L)	2.53		DOSAGE (mg/L)	2.36		DOSAGE (mg/L)	2.38		DOSAGE (mg/L)	2.46		DOSAGE (mg/L)	2.56		DOSAGE (mg/L)	2.68		DOSAGE (mg/L)	2.64		DOSAGE (mg/L)	3.07		DOSAGE (mg/L)	2.96		DOSAGE (mg/L)	3.02		DOSAGE (mg/L)	2.89

Maximum Instantaneous Readings

Appendix A-6

2013		January		Feb		March		April		May		June		July		August		September		October		November		December
1	Tue	1,805.76	Fri	1,531.01	Fri	1,708.99	Mon	1,786.75	Wed	1,677.89	Sat	1,738.37	Mon	1,799.71	Thu	1,503.36	Sun	1356.48	Tue	1,351.30	Fri	1,663.20	Sun	1,545.70
2	Wed	1,783.30	Sat	1,992.38	Sat	1,881.79	Tue	1,734.05	Thu	1,705.54	Sun	1,592.35	Tue	1,761.70	Fri	1,590.62	Mon	1543.97	Wed	1,783.30	Sat	1,601.86	Mon	1,486.08
3	Thu	1,321.92	Sun	1,761.70	Sun	1,805.76	Wed	1,752.19	Fri	1,716.77	Mon	1,567.30	Wed	2,003.62	Sat	1,772.93	Tue	21600	Thu	2,172.10	Sun	1,499.90	Tue	1,620.00
4	Fri	1,309.82	Mon	1,522.37	Mon	1,558.66	Thu	9,011.52	Sat	1,963.01	Tue	1,761.70	Thu	5,735.23	Sun	1,620.00	Wed	1389.31	Fri	1,478.30	Mon	7,717.25	Wed	1,313.28
5	Sat	1,534.46	Tue	1,518.05	Tue	1,645.06	Fri	2,050.27	Sun	1,939.68	Wed	1,880.06	Fri	1,710.72	Mon	1,583.71	Thu	1442.02	Sat	1,344.38	Tue	4,593.02	Thu	1,801.44
6	Sun	1,656.29	Wed	1,647.65	Wed	1,549.15	Sat	2,020.03	Mon	1,830.82	Thu	2,128.90	Sat	1,641.60	Tue	1,536.19	Fri	1578.53	Sun	1,454.98	Wed	1,384.13	Fri	1,583.71
7	Mon	1,365.98	Thu	1,607.04	Thu	1,652.83	Sun	1,928.45	Tue	1,741.82	Fri	1,575.07	Sun	1,448.93	Wed	1,708.99	Sat	1505.95	Mon	1,255.39	Thu	1,763.42	Sat	1,664.06
8	Tue	1,407.46	Fri	1,529.28	Fri	1,716.77	Mon	1,669.25	Wed	1,727.14	Sat	1,631.23	Mon	1,485.22	Thu	1,596.67	Sun	1756.51	Tue	1,512.86	Fri	1,689.12	Sun	1,447.20
9	Wed	1,340.06	Sat	1,848.96	Sat	1,814.40	Tue	1,918.08	Thu	1,791.07	Sun	1,966.46	Tue	1,626.91	Fri	1,632.96	Mon	1985.47	Wed	1,404.00	Sat	1,480.03	Mon	1,387.58
10	Thu	1,910.30	Sun	1,788.48	Sun	1,685.66	Wed	1,740.10	Fri	1,611.36	Mon	1,512.86	Wed	1,336.61	Sat	1,754.78	Tue	1545.7	Thu	1,305.50	Sun	1,504.40	Tue	1,035.94
11	Fri	1,432.51	Mon	1,572.48	Mon	1,583.71	Thu	2,134.08	Sat	1,823.90	Tue	1,486.08	Thu	1,511.14	Sun	1,685.66	Wed	1616.54	Fri	1,537.92	Mon	1,467.94	Wed	1,392.77
12	Sat	1,645.92	Tue	1,607.04	Tue	1,685.66	Fri	1,715.90	Sun	1,863.65	Wed	1,672.70	Fri	1,454.98	Mon	1,656.29	Thu	1966.46	Sat	1,507.68	Tue	1,560.38	Thu	1,563.84
13	Sun	1,618.27	Wed	1,607.04	Wed	1,575.07	Sat	1,874.02	Mon	1,881.79	Thu	4,973.18	Sat	1,404.00	Tue	9,248.26	Fri	1975.96	Sun	1,382.40	Wed	1,410.91	Fri	1,558.66
14	Mon	1,448.93	Thu	1,656.29	Thu	1,525.82	Sun	1,863.65	Tue	1,689.12	Fri	1,511.14	Sun	1,492.99	Wed	1,461.89	Sat	1683.94	Mon	1,324.76	Thu	3,881.09	Sat	1,522.37
15	Tue	1,405.73	Fri	1,611.36	Fri	1,667.52	Mon	1,812.67	Wed	1,776.38	Sat	1,549.15	Mon	10,593.50	Thu	5,759.42	Sun	1499.9	Tue	2,005.34	Fri	1,565.57	Sun	1,442.01
16	Wed	1,460.16	Sat	1,796.26	Sat	1,994.11	Tue	1,679.62	Thu	1,718.50	Sun	1,580.26	Tue	8,846.50	Fri	1,590.62	Mon	1756.51	Wed	7,517.66	Sat	1,485.22	Mon	1,491.26
17	Thu	7,495.20	Sun	1,785.02	Sun	2,097.79	Wed	1,588.90	Fri	1,878.34	Mon	1,511.14	Wed	8,913.89	Sat	1,786.75	Tue	1522.37	Thu	1,634.69	Sun	1,445.47	Tue	1,969.06
18	Fri	1,979.42	Mon	1,745.28	Mon	2,064.96	Thu	1,812.67	Sat	1,949.18	Tue	1,598.40	Thu	1,770.34	Sun	2,050.27	Wed	1380.67	Fri	1,433.38	Mon	1,363.26	Wed	2,015.71
19	Sat	1,682.21	Tue	1,641.60	Tue	1,834.78	Fri	1,659.74	Sun	1,812.67	Wed	1,567.30	Fri	8,462.02	Mon	1,705.54	Thu	3879.36	Sat	1,385.86	Tue	1,485.22	Thu	3,961.44
20	Sun	1,626.91	Wed	1,600.13	Wed	1,837.73	Sat	1,805.76	Mon	1,954.37	Thu	1,716.77	Sat	1,616.54	Tue	1,855.87	Fri	1581.98	Sun	1,503.36	Wed	1,344.38	Fri	1,380.67
21	Mon	3,501.79	Thu	1,467.07	Thu	2,059.78	Sun	1,817.86	Tue	1,727.14	Fri	1,537.92	Sun	1,511.14	Wed	1,620.00	Sat	1716.77	Mon	4,314.82	Thu	1,547.42	Sat	1,543.97
22	Tue	3,510.43	Fri	1,834.27	Fri	2,308.61	Mon	1,847.23	Wed	1,438.56	Sat	1,745.28	Mon	1,438.56	Thu	1,590.62	Sun	1556.06	Tue	1,601.86	Fri	1,721.95	Sun	1,454.98
23	Wed	2,597.18	Sat	2,163.46	Sat	1,888.70	Tue	1,924.99	Thu	1,620.00	Sun	4,222.37	Tue	1,681.34	Fri	1,792.80	Mon	1512.86	Wed	1,326.24	Sat	1,516.32	Mon	1,467.07
24	Thu	2,553.98	Sun	1,972.51	Sun	1,779.84	Wed	1,885.25	Fri	1,461.89	Mon	6,487.79	Wed	1,664.06	Sat	1,522.37	Tue	2712.96	Thu	7,108.13	Sun	1,588.90	Tue	1,748.74
25	Fri	1,888.70	Mon	1,690.85	Mon	1,703.81	Thu	1,807.49	Sat	1,641.60	Tue	1,810.94	Thu	1,626.91	Sun	1,634.69	Wed	1494.72	Fri	1,533.60	Mon	1,231.20	Wed	1,353.02
26	Sat	1,569.02	Tue	1,636.42	Tue	1,672.70	Fri	1,740.10	Sun	1,687.39	Wed	1,570.75	Fri	1,576.80	Mon	1,916.35	Thu	1489.54	Sat	1,656.29	Tue	1,454.98	Thu	1,593.22
27	Sun	1,590.62	Wed	1,683.94	Wed	1,848.96	Sat	2,032.99	Mon	1,661.47	Thu	1,570.75	Sat	1,837.73	Tue	10,964.16	Fri	1538.78	Sun	1,372.90	Wed	1,354.75	Fri	1,537.92
28	Mon	1,498.18	Thu	1,708.99	Thu	1,616.54	Sun	1,988.93	Tue	1,759.97	Fri	1,460.16	Sun	1,700.35	Wed	1,453.25	Sat	1531.01	Mon	1,321.92	Thu	1,536.19	Sat	1,485.21
29	Tue	1,489.54			Fri	1,829.09	Mon	1,788.48	Wed	1,725.41	Sat	1,616.54	Mon	1,690.85	Thu	1,509.41	Sun	1422.14	Tue	1,435.10	Fri	1,592.35	Sun	1,509.41
30	Wed	1,620.00			Sat	1,863.65	Tue	1,841.18	Thu	4,973.18	Sun	1,750.46	Tue	1,527.55	Fri	1,343.52	Mon	1351.3	Wed	1,321.92	Sat	1,558.66	Mon	1,398.82
31	Thu	1,603.58			Sun	1,901.66			Fri	1,592.35			Wed	1,690.85	Sat	1,387.58			Thu	1,360.80			Tue	1,797.98
Min		1,309.82		1,467.07		1,525.82		1,588.90		1,438.56		1,460.16		1,336.61		1,343.52		1,351.30		1,255.39		1,231.20		1,035.94
Max		7,495.20		2,163.46		2,308.61		9,011.52		4,973.18		6,487.79		10,593.50		10,964.16		21,600.00		7,517.66		7,717.25		3,961.44
Average		1,956.57		1,697.39		1,785.79		2,074.41		1,849.74		2,009.78		2,727.82		2,317.28		2,363.13		1,956.41		1,900.28		1,615.26
		1212.84		1137.53		1205.36		1347.51		1182.18		1155.43		1566.64		1345.66		1287.92		1002.37		1002.99		947.20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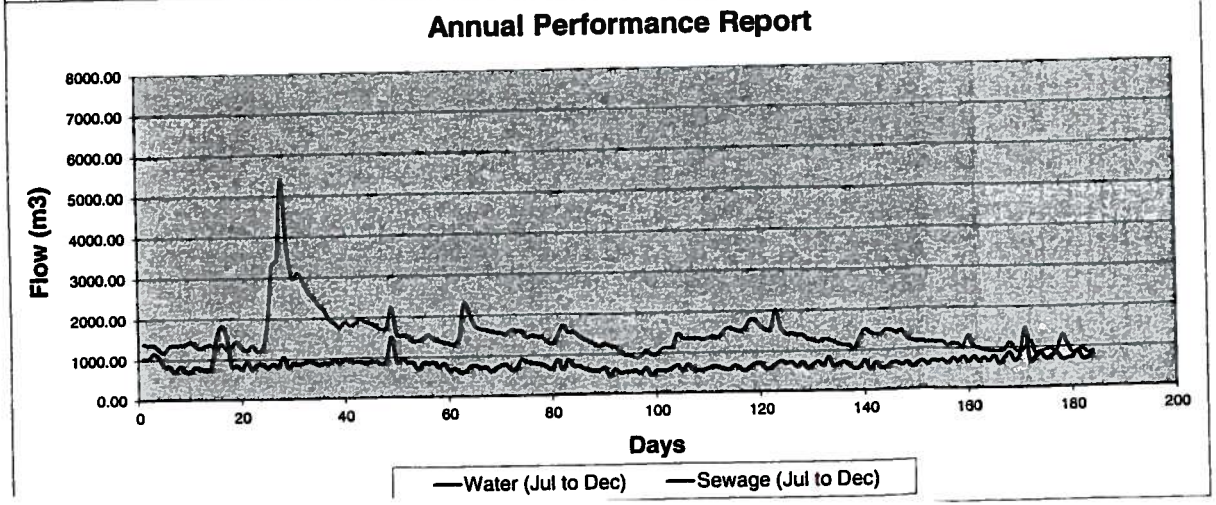
7,000.00
6,000.00
5,000.00
4,000.00
3,000.00
2,000.00
1,000.00
0.00
0
20
40
60
80
100
120
140
160
180
Days
—Water (Jan to Jun)
—Sewage (Jan to Jun)


Annual Performance Report
Flow (m3)
8000.00
7000.00
6000.00
5000.00
4000.00
3000.00
2000.00
1000.00
0.00
0
20
40
60
80
100
120
140
160
180
200
Days
—Water (Jul to Dec)
—Sewage (Jul to Dec)

Minimum Instantaneous Readings

Appendix A-7

2013		January		Feb		March		April		May		June		July		August		September		October		November		December
1	Tue	349.06	Fri	430.27	Fri	591.84	Mon	644.54	Wed	667.01	Sat	364.61	Mon	268.70	Thu	372.38	Sun	25.06	Tue	3.46	Fri	216.00	Sun	216.00
2	Wed	392.26	Sat	497.66	Sat	559.01	Tue	664.42	Thu	686.88	Sun	328.32	Tue	330.91	Fri	328.32	Mon	230.69	Wed	5.18	Sat	26.78	Mon	235.87
3	Thu	227.23	Sun	517.54	Sun	575.42	Wed	649.73	Fri	646.27	Mon	227.23	Wed	456.19	Sat	387.07	Tue	0.00	Thu	1.73	Sun	230.69	Tue	235.87
4	Fri	222.05	Mon	552.10	Mon	583.20	Thu	3.46	Sat	672.19	Sun	395.71	Thu	303.26	Sun	468.29	Wed	278.21	Fri	0.00	Mon	3.46	Wed	212.54
5	Sat	301.54	Tue	581.47	Tue	609.98	Fri	628.13	Sun	731.81	Wed	435.46	Fri	47.52	Mon	350.78	Thu	286.85	Sat	3.46	Tue	6.91	Thu	308.45
6	Sun	387.07	Wed	578.02	Wed	575.42	Sat	641.09	Mon	731.81	Thu	314.50	Sat	14.69	Tue	463.10	Fri	288.58	Sun	1.73	Wed	196.13	Fri	204.77
7	Mon	245.38	Thu	510.62	Thu	542.59	Sun	679.10	Tue	673.92	Fri	248.83	Sun	298.08	Wed	481.25	Sat	247.19	Mon	1.73	Thu	14.69	Sat	16.42
8	Tue	413.86	Fri	539.14	Fri	492.48	Mon	662.69	Wed	685.15	Sat	317.95	Mon	0.00	Thu	390.53	Sun	210.82	Tue	1.73	Fri	14.69	Sun	252.29
9	Wed	350.78	Sat	597.89	Sat	527.04	Tue	695.52	Thu	616.03	Sun	444.96	Tue	270.43	Fri	425.89	Mon	290.30	Wed	8.64	Sat	23.33	Mon	270.43
10	Thu	235.87	Sun	595.30	Sun	540.86	Wed	670.46	Fri	603.07	Mon	304.99	Wed	36.29	Sat	387.07	Tue	304.99	Thu	6.91	Sun	248.83	Tue	290.30
11	Fri	268.70	Mon	595.30	Mon	570.24	Thu	666.14	Sat	668.74	Tue	290.30	Thu	240.19	Sun	488.16	Wed	332.64	Fri	6.91	Mon	374.11	Wed	281.66
12	Sat	373.82	Tue	601.34	Tue	595.30	Fri	648.00	Sun	688.61	Wed	323.14	Fri	222.05	Mon	347.33	Thu	446.69	Sat	19.87	Tue	192.67	Thu	278.21
13	Sun	385.00	Wed	583.20	Wed	578.02	Sat	596.16	Mon	3.46	Thu	3.46	Sat	303.26	Tue	1.73	Fri	194.40	Sun	6.91	Wed	275.62	Fri	245.38
14	Mon	248.83	Thu	635.90	Thu	586.66	Sun	617.76	Tue	664.42	Fri	292.03	Sun	304.99	Wed	310.18	Sat	316.22	Mon	6.91	Thu	6.91	Sat	21.60
15	Tue	550.37	Fri	577.15	Fri	738.72	Mon	635.90	Wed	543.46	Sat	216.00	Mon	1.73	Thu	110.59	Sun	271.30	Tue	5.18	Fri	6.91	Sun	268.70
16	Wed	328.32	Sat	573.70	Sat	939.17	Tue	666.14	Thu	611.71	Sun	317.95	Tue	3.46	Fri	254.02	Mon	263.52	Wed	3.46	Sat	12.96	Mon	260.06
17	Thu	388.80	Sun	621.22	Sun	962.50	Wed	619.49	Fri	611.71	Mon	365.47	Wed	1.73	Sat	432.00	Tue	293.76	Thu	5.18	Sun	14.69	Tue	290.30
18	Fri	0.00	Mon	543.46	Mon	827.71	Thu	670.46	Sat	599.62	Tue	419.90	Thu	316.22	Sun	711.94	Wed	299.81	Fri	8.64	Mon	330.91	Wed	988.42
19	Sat	581.47	Tue	603.07	Tue	604.80	Fri	590.11	Sun	668.74	Wed	383.62	Fri	3.46	Mon	400.03	Thu	323.14	Sat	6.91	Tue	9.50	Thu	246.46
20	Sun	581.47	Wed	588.38	Wed	599.62	Sat	660.96	Mon	723.17	Thu	332.64	Sat	276.48	Tue	497.66	Fri	365.47	Sun	5.18	Wed	9.50	Fri	278.20
21	Mon	659.23	Thu	550.37	Thu	705.02	Sun	649.73	Tue	339.55	Fri	306.72	Sun	395.72	Wed	425.09	Sat	290.30	Mon	6.91	Thu	15.69	Sat	260.06
22	Tue	1,022.11	Fri	492.48	Fri	617.76	Mon	675.65	Wed	230.69	Sat	726.62	Mon	308.45	Thu	254.02	Sun	317.59	Tue	8.64	Fri	9.50	Sun	349.06
23	Wed	1,416.96	Sat	757.73	Sat	588.38	Tue	713.66	Thu	225.50	Sun	1.73	Tue	387.07	Fri	323.14	Mon	234.14	Wed	6.91	Sat	6.91	Mon	263.52
24	Thu	880.42	Sun	616.03	Sun	616.03	Wed	718.85	Fri	266.98	Mon	62.21	Wed	381.02	Sat	321.41	Tue	241.92	Thu	6.91	Sun	14.69	Tue	312.77
25	Fri	481.25	Mon	634.18	Mon	599.62	Thu	705.02	Sat	32.83	Tue	367.20	Thu	279.94	Sun	332.64	Wed	1.73	Fri	5.18	Mon	240.19	Wed	319.68
26	Sat	494.21	Tue	597.89	Tue	659.23	Fri	695.52	Sun	281.66	Wed	260.06	Fri	330.91	Mon	306.72	Thu	5.18	Sat	14.69	Tue	199.58	Thu	377.82
27	Sun	439.78	Wed	611.71	Wed	641.09	Sat	666.14	Mon	223.78	Thu	0.00	Sat	0.00	Tue	3.46	Fri	5.18	Sun	217.73	Wed	222.05	Fri	311.04
28	Mon	439.78	Thu	591.84	Thu	603.07	Sun	730.08	Tue	520.99	Fri	321.41	Sun	4,899.02	Wed	260.06	Sat	6.91	Mon	11.23	Thu	9.50	Sat	283.39
29	Tue	522.72			Fri	613.44	Mon	753.41	Wed	532.22	Sat	283.34	Mon	0.00	Thu	252.29	Sun	5.18	Tue	197.86	Fri	216.00	Sun	328.32
30	Wed	532.22			Sat	619.49	Tue	0.00	Thu	29.38	Sun	375.84	Tue	444.96	Fri	204.77	Mon	3.46	Wed	268.70	Sat	21.60	Mon	349.06
31	Thu	426.82			Sun	670.46			Fri	362.88			Wed	0.00	Sat	192.67			Thu	294.62			Tue	334.37
Min		0.00		430.27		492.48		0.00		3.46		0.00		0.00		1.73		0.00		0.00		3.46		16.42
Max		1,416.96		757.73		962.50		753.41		731.81		726.62		4,899.02		711.94		446.69		294.62		374.11		988.42
Average		456.37		577.68		630.13		620.61		501.43		301.07		358.93		338.21		212.71		37.07		105.70		286.81

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Appendix B-1

Summary of Inorganics Treated Water							
Parameter	M.A.C. or I.M.A.C.	Unit of Measure	Result		Unit of Measure	Exceedence	Action Required
Antimony	0.0001	mg/L	<	0.6	ug/L	No	No
Arsenic	0.025	mg/L	<	1	ug/L	No	No
Barium	1	mg/L		43	ug/L	No	No
Boron	5	mg/L	<	500	ug/L	No	No
Cadmium	0.005	mg/L	<	0.1	ug/L	No	No
Chromium	0.05	mg/L	<	1	ug/L	No	No
Flouride	1.5	mg/L		---	mg/L	No	No
Lead	0.01	mg/L		---	ug/L	No	No
Mercury	0.001	mg/L	<	0.1	ug/L	No	No
Nirtate	10	mg/L		1.54	mg/L	No	No
Nitrite	1	mg/L	<	0.02	mg/L	No	No
Selenium	0.01	mg/L	<	1	ug/L	No	No
Sodium [1]	20	mg/L		---	mg/L	Yes	Yes
Uranium	0.1	mg/L	<	2	ug/L	No	No

[1]The Ontario Spills Action Center and the Thunder Bay District Healt Unit, Medical Officer of Health have been notified. Warning notices have been posted and local doctors advised to alert persons on a sodium restricted diet to use an alternative potable water supply for cooking and drinking purposes. When sodium levels exceed 200 ug/L, corrective measures may be ordered.

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Appendix B-2

Summary of Organics Treated Water							
Parameter	**M.A.C. or I.M.A.C.**	**Units**	**Results**			**Exceedence**	**Action Required**
Alachlor	0.005	mg/L	<	0.1	ug/L	No	No
Aldicarb	0.009	mg/L	<	1	ug/L	No	No
Aldrin + Dieldrin	0.007	mg/L	<	0.04	ug/L	No	No
Atrazine + N-dialkylated metobolites	0.005	mg/L	<	0.2	ug/L	No	No
Azinphos-methyl	0.02	mg/L	<	0.1	ug/L	No	No
Bendiocarb	0.04	mg/L	<	0.2	ug/L	No	No
Benzene	0.005	mg/L	<	0.5	ug/L	No	No
Benzo (a) pyrene	0.0001	mg/L	<	0.01	ug/L	No	No
Bromoxynil	0.005	mg/L	<	0.2	ug/L	No	No
Carbaryl	0.09	mg/L	<	0.2	ug/L	No	No
Carbofuran	0.09	mg/L	<	0.2	ug/L	No	No
Carbon Tetrachloride	0.005	mg/L	<	0.5	ug/L	No	No
Chlordane (Total)	0.007	mg/L	<	0.3	ng/L	No	No
Chlorpyrifos	0.08	mg/L	<	0.1	ug/L	No	No
Cyanazine	0.01	mg/L	<	0.1	ug/L	No	No
Diazinon	0.02	mg/L	<	0.1	ug/L	No	No
Dicamba	0.12	mg/L	<	0.2	ug/L	No	No
1,2-Dichlorobenzene	0.2	mg/L	<	0.5	ug/L	No	No
1,4-Dichlorobenzene	0.005	mg/L	<	0.5	ug/L	No	No
Dichlorodiphenyltrichloroethane (DDT) + metabolites	0.03	mg/L	<	0.4	ng/L	No	No
1,2-Dichloroethane	0.005	mg/L	<	0.5	ug/L	No	No
1,1-Dichloroethylene (vinylidene chloride)	0.014	mg/L	<	0.5	ug/L	No	No
Dichloromethane	0.05	mg/L	<	0.5	ug/L	No	No
2-4 Dichlorophenol	0.09	mg/L	<	0.3	ug/L	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	0.1	mg/L	<	0.2	ug/L	No	No
Diclofop-methyl	0.009	mg/L	<	0.2	ug/L	No	No
Dimethoate	0.02	mg/L	<	0.1	ug/L	No	No
Dinoseb	0.01	mg/L	<	0.2	ug/L	No	No
Diquat	0.07	mg/L	<	1	ug/L	No	No

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Appendix B-2

Summary of Organics Treated Water							
Parameter	M.A.C. or I.M.A.C.	Units	Results			Exceedence	Action Required
Diuron	0.15	mg/L	<	1	ug/L	No	No
Glyphosate	0.28	mg/L	<	5	ug/L	No	No
Heptachlor + Heptachlor Epoxide	0.003	mg/L	<	0.2	ug/L	No	No
Linadane (Total)	0.004	mg/L	<	0.1	ug/L	No	No
Malathion	0.19	mg/L	<	0.1	ug/L	No	No
Methoxychlor	0.9	mg/L	<	0.1	ug/L	No	No
Metolachlor	0.05	mg/L	<	0.1	ug/L	No	No
Metribuzin	0.08	mg/L	<	0.1	ug/L	No	No
Monochlorobenzene	0.02	mg/L	<	0.5	ug/L	No	No
Paraquat	0.01	mg/L	<	1	ug/L	No	No
Parathion	0.05	mg/L	<	0.1	ug/L	No	No
Pentachlorophenol	0.05	mg/L	<	0.5	ug/L	No	No
Phorate	0.002	mg/L	<	0.1	ug/L	No	No
Picloram	0.19	mg/L	<	0.2	ug/L	No	No
Polychlorinated Biphenyls (PCB)	0.003	mg/L	<	0.035	ug/L	No	No
Prometryne	0.001	mg/L	<	0.1	ug/L	No	No
Simazine	0.01	mg/L	<	0.1	ug/L	No	No
Total Trihalomethanes	0.15	mg/L		30.6	ug/L	No	No
Temephos	0.28	mg/L	<	0.1	ug/L	No	No
Terbufos	0.001	mg/L	<	0.2	ug/L	No	No
Tetrachloroethylene	0.03	mg/L	<	0.5	ug/L	No	No
2,3,4,6-Tetrachlorophenol	0.1	mg/L	<	0.5	ug/L	No	No
Triallate	0.23	mg/L	<	0.1	ug/L	No	No
Trichloroethylene	0.05	mg/L	<	0.5	ug/L	No	No
2,4,6-Trichlorophenol	0.1	mg/L	<	0.5	ug/L	No	No
2,4,5-Trichlorophenoxy Acetic Acid (2,4,5-T)	0.28	mg/L	<	0.2	ug/L	No	No
Trifluralin	0.045	mg/L	<	0.1	ug/L	No	No
Vinyl Chloride	0.07	mg/L	<	0.5	ug/L	No	No

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Appendix B-3

Summary of Inorganics Treated Water								
Parameter	M.A.C. or I.M.A.C.	Unit of Measure	January 14 2013	March 01 2013	June 01 2013	September 23 2013	Exceedence	Action Required
Nitrate	10	mg/L	1.54	1.27	1.06	1.43	No	No
Nitrite	1	mg/L	< 0.02	<0.02	<0.02	<0.02	No	No
THM	0.15	mg/L	30.6 ug/L	21.4ug/L	31.8 ug/L	30.2 ug/L	No	No

**THM Running average value is. 28.5 mg/L.

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Appendix B4-A

Sumary of chemical, Physical and Operational Parameters										
			Raw Water							
Parameter	M.A.C. or I.M.A.C.	Units	Well #1 March 14, 2013	Well #4 March 14, 2013	Well #5 March 14, 2013	Well #2 Oct 29, 2013	Well #3 Oct 29,2013	Well #5 Oct 29,2013	Exceedence	Action Required
Alkalinity	30 - 500	mg/L	322	267	327	315	286	326	No	No
Ammonia & Ammonium	0.15	mg/L	—	—	—	0.008	0.008	0.008	No	No
Chloride	250	mg/L	59.4	65.4	71.8	55	61.8	57	No	No
Colour	5	TCU	3.5	1.6	2.2	2.3	1.2	4.4	No	No
Conductivity	?	uS/cm	808	777	892	786	803	822	?	?
Dissolved Organic Carbon	5	mg/L	2.5	1.3	1.9	2	1.3	2.5	No	No
Dissolved Inorganic Carbon	?	mg/L	80.6	65.3	80	79.5	71.1	79.4	?	?
Dissolved Solids	?	mg/L	—	—	—	—	—	—	?	?
Fluoride	1.5 - 2.4	mg/L	0.06	0.05	0.07	0.09	0.07	0.08	No	No
Hardness	80 - 100	mg/L	—	—	—	—	—	—	Yes [1]	No
Langaliers Index	?	—	—	—	—	—	—	—	?	?
Nitrate	10	mg/L	—	—	—	1.489	1.939	0.176	No	No
Nitrite	1	mg/L	—	—	—	0.001	0.001	0.004	No	No
pH	6.5 - 8.5	—	7.66	7.82	7.69	7.71	7.82	7.71	No	No
pH Saturated	6.5 - 8.6	—	—	—	—	—	—	—	No	No
Phosphorus	?	mg/L	—	—	—	0.002	0.0023	0.0016	?	?
Silicon	?	mg/L	4.52	4.24	4.58	4.34	4.34	4.52	?	?
Sulphate	150 - 500	mg/L	15.3	32.6	38.8	17.2	42	37.5	No	No
Turbidity	1	FTU	—	—	—	—	—	—	No	No
Phosphate	?	mg/L	—	—	—	0.002	0.0023	0.0016	?	?
Total Kjeldahl Nitrogen (TKN)	?	mg/L	—	—	—	—	—	—	?	?

[1] The M.A.C of 80 - 100 mg/L for Hardness is an Aesthetic Objective. If hardness Exceeds 500 mg/L further action may be ordered.

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Appendix B4-B

Sumary of Chemical, Physical and Operational Parameters Treated						
Parameter	M.A.C. or I.M.A.C.	Units	Reservoir March 14 2013	Reservoir Oct 29, 2013	Exceedence	Action Required
Alkalinity	30 - 500	mg/L	302	315	No	No
Ammonia & Ammonium (N)	0.15	mg/L	—	0.01	No	No
Chloride	250	mg/L	66	57.8	No	No
Colour	5	TCU	2.8	2.6	No	No
Conductivity	?	uS/cm	830	778	?	?
Dissolved Organic Carbon	5	mg/L	1.8	2	No	No
Dissolved Inorganic Carbon	?	mg/L	71.4	77.3	?	?
Dissolved Solids	?	mg/L	—	—	?	?
Fluoride	1.5 - 2.4	mg/L	0.07	0.09	No	No
Hardness	80 - 100	mg/L	—	—	No	No
Langaliers Index	?	—	—	—	?	?
Nitrate	10	mg/L	—	1.469	No	No
Nitrite	1	mg/L	—	0.001	No	No
pH	6.5 - 8.5	—	8.02	8.02	No	No
pH Saturated	6.5 - 8.6	—	—	—	No	No
Phosphorus	?	mg/L	—	0.0018	?	?
Silicon	?	mg/L	4.44	4.34	?	?
Sulphate	150 - 500	mg/L	31.6	18.3	No	No
Phosphate	?	mg/L	—	0.0018	?	?
Total Kjeldahl Nitrogen (TKN)	?	mg/L	—	—	?	?

[1]The M.A.C. of 80 - 100 mg/L for Hardness is an aesthetic objective. When Hardness exceeds 500 mg/L, corrective measures may be ordered.

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Appendix B5-A

INORGANICS																						
Raw Water																						
Parameter	M.A.C. or I.M.A.C.	Units	Well #1 March 14, 2013		Well 4 March 14, 2013		Well 5 March 14, 2013		Well #2 Oct 29, 2013		Well #3 Oct 29, 2013		Well #5 Oct 29, 2013		Exceedence	Action Required
Aluminum	0.1	mg/L	0.7	ug/L	0.5	ug/L	0.6	ug/L	0.8	ug/L	0.5	ug/L	0.9	ug/L	No	No
Antimony	0.0001	mg/L	0.7	ug/L	0.6	ug/L	0.7	ug/L	0.7	ug/L	0.8	ug/L	0.9	ug/L	No	No
Arsenic	0.025	mg/L	0.3	ug/L	0.3	ug/L	0.3	ug/L	0.2	ug/L	0.2	ug/L	0.3	ug/L	No	No
Barium	?	mg/L	48	ug/L	26.8	ug/L	27.4	ug/L	44.4	ug/L	39	ug/L	48.6	ug/L	No	No
Beryllium	?	mg/L	0	ug/L	0	ug/L	0	ug/L	0	ug/L	0	ug/L	0	ug/L	No	No
Boron	5	mg/L	20.2	ug/L	13.4	ug/L	15.3	ug/L	18.1	ug/L	16.3	ug/L	12.5	ug/L	No	No
Cadmium	0.005	mg/L	0	ug/L	0	ug/L	0	ug/L	0	ug/L	0	ug/L	0.1	ug/L	No	No
Calcium	?	mg/L	—	mg/L	—	mg/L	—	mg/L	—	mg/L	—	mg/L	—	mg/L	No	No
Chromium	0.05	mg/L	0.5	ug/L	0.8	ug/L	0.4	ug/L	0.2	ug/L	0.3	ug/L	0.1	ug/L	No	No
Cobolt	?	mg/L	0.2	ug/L	0.1	ug/L	0.3	ug/L	0.2	ug/L	0.2	ug/L	0.5	ug/L	No	No
Copper	1	mg/L	1.9	ug/L	1.9	ug/L	3.5	ug/L	2.2	ug/L	2.5	ug/L	4.9	ug/L	No	No
Iron	0.3	mg/L	60	ug/L	0	ug/L	0	ug/L	20	ug/L	0	ug/L	80	ug/L	No	No
Lead	0.01	mg/L	0	ug/L	0	ug/L	0	ug/L	0	ug/L	0.1	ug/L	0.2	ug/L	No	No
Magnesium	?	mg/L	—	mg/L	—	mg/L	—	mg/L	—	mg/L	—	mg/L	—	mg/L	No	No
Manganese	0.05	mg/L	59.4 [1]	ug/L	0.3	ug/L	19.7	ug/L	28	ug/L	6.6	ug/L	37.4	ug/L	Yes [1]	No
Molybdenum	?	mg/L	0.2	ug/L	0.2	ug/L	0.3	ug/L	0.3	ug/L	0.3	ug/L	0.3	ug/L	No	No
Nickel	?	mg/L	0.7	ug/L	0.5	ug/L	1.6	ug/L	0.7	ug/L	0.5	ug/L	2.3	ug/L	No	No
Potassium	?	mg/L	—	mg/L	—	mg/L	—	mg/L	—	mg/L	—	mg/L	—	mg/L	No	No
Selenium	0.01	mg/L	0.4	ug/L	0.8	ug/L	1.1	ug/L	0.2	ug/L	1.1	ug/L	0.7	ug/L	No	No
Silver	?	mg/L	0	ug/L	0	ug/L	0	ug/L	0	ug/L	0	ug/L	0	ug/L	No	No
Sodium	20	mg/L	—	mg/L	—	mg/L	—	mg/L	—	mg/L	—	mg/L	—	mg/L	Yes [2]	No
Strontium	?	mg/L	137	ug/L	102	ug/L	146	ug/L	126	ug/L	115	ug/L	139	ug/L	No	No
Thallium	?	mg/L	0	ug/L	0	ug/L	0.1	ug/L	0	ug/L	0	ug/L	0.1	ug/L	No	No
Titanium	?	mg/L	0.3	ug/L	0.6	ug/L	0.6	ug/L	0.4	ug/L	0.8	ug/L	0.8	ug/L	No	No
Uranium	0.1	mg/L	0.9	ug/L	0.6	ug/L	3.1	ug/L	0.9	ug/L	1.4	ug/L	3.5	ug/L	No	No
Vanadium	?	mg/L	0.2	ug/L	0.2	ug/L	0.5	ug/L	0.2	ug/L	0.4	ug/L	0.5	ug/L	No	No
Zinc	5	mg/L	1.4	ug/L	4.2	ug/L	1.4	ug/L	0.8	ug/L	6.5	ug/L	4.7	ug/L	No	No

[1]The M.A.C. of 0.05 mg/L (50 ug/L) for manganese is a colour related aesthetic objective. Like Iron, Manganese may stain laundered items and plumbing fixtures and in excessive concentrations, may cause undesirable tastes in beverages and drinking water.

[2]The Ontario Spills Action Center and the Thunder Bay District Healt Unit, Medical Officer of Health have been notified. Warning notices have been posted and local doctors advised to alert persons on a sodium restricted diet to use another potable water supply for cooking and drinking purposes. When sodium levels exceed 200 ug/L, corrective measures may be ordered.

ANNUAL REPORT
2013
Drinking Water Surveillance Program

Appendix B5-B

INORGANICS													
Treated Water													
Parameter	M.A.C. or I.M.A.C.	Units	Reservoir March 14, 2013		Reservoir Oct 29, 2013		Distribution March 14, 2013		Distribution Oct 29, 2013		Exceedence	Action Required
Aluminum	0.1	mg/L	1.6	ug/L	1	ug/L	1.3	ug/L	1	ug/L	No	No
Antimony	0.006	mg/L	0.6	ug/L	0.6	ug/L	0.6	ug/L	0.7	ug/L	No	No
Arsenic	0.025	mg/L	0.3	ug/L	0.2	ug/L	0.3	ug/L	0.2	ug/L	No	No
Barium	?	mg/L	41.6	ug/L	43.5	ug/L	40.1	ug/L	43.4	ug/L	?	?
Beryllium	?	mg/L	0	ug/L	0	ug/L	0	ug/L	0	ug/L	?	?
Boron	5	mg/L	17.4	ug/L	18	ug/L	16.7	ug/L	17.2	ug/L	No	No
Cadmium	0.005	mg/L	0	ug/L	0	ug/L	0	ug/L	0	ug/L	No	No
Calcium	?	mg/L	—	mg/L	—	mg/L	—	mg/L	—	mg/L	?	?
Chromium	0.05	mg/L	0.6	ug/L	0.2	ug/L	0.5	ug/L	0.5	ug/L	No	No
Cobolt	?	mg/L	0.2	ug/L	0.2	ug/L	0.2	ug/L	0.2	ug/L	?	?
Copper	1	mg/L	91.3	ug/L	113	ug/L	189	ug/L	237	ug/L	No	No
Iron	0.3	mg/L	10	ug/L	20	ug/L	10	ug/L	20	ug/L	No	No
Lead	0.01	mg/L	0.2	ug/L	0.1	ug/L	0.1	ug/L	0.2	ug/L	No	No
Magnesium	?	mg/L	—	mg/L	—	mg/L	—	mg/L	—	mg/L	?	?
Manganese	0.05	mg/L	23	ug/L	22.3	ug/L	12.8	ug/L	11.2	ug/L	No	No
Molybdenum	?	mg/L	0.2	ug/L	0.2	ug/L	0.2	ug/L	0.2	ug/L	?	?
Nickel	?	mg/L	0.8	ug/L	0.8	ug/L	0.7	ug/L	0.9	ug/L	?	?
Potassium	?	mg/L	—	mg/L	—	mg/L	—	mg/L	—	mg/L	?	?
Selenium	0.01	mg/L	1.1	ug/L	0.2	ug/L	1.3	ug/L	0.2	ug/L	No	No
Silver	?	mg/L	0	ug/L	0	ug/L	0	ug/L	0	ug/L	?	?
Sodium	20	mg/L	—	mg/L	—	mg/L	—	mg/L	—	mg/L	Yes [2]	Yes
Strontium	?	mg/L	124	ug/L	126	ug/L	121	ug/L	127	ug/L	?	?
Thallium	?	mg/L	0	ug/L	0	ug/L	0	ug/L	0	ug/L	?	?
Titanium	?	mg/L	0.6	ug/L	0.4	ug/L	0.6	ug/L	0.5	ug/L	?	?
Uranium	0.1	mg/L	1.5	ug/L	0.9	ug/L	1.5	ug/L	1	ug/L	No	No
Vanadium	?	mg/L	0.4	ug/L	0.3	ug/L	0.3	ug/L	0.3	ug/L	?	?
Zinc	5	mg/L	3.1	ug/L	3.3	ug/L	2.4	ug/L	3.8	ug/L	No	No

[1]The Ontario Spills Action Center and the Thunder Bay District Healt Unit, Medical Officer of Health have been notified. Warning notices have been posted and local doctors advised to alert persons on a sodium restricted diet to use another potable water supply for cooking and drinking purposes. When sodium levels exceed 200 ug/L, corrective measures may be ordered.

T.N.P - Test Not Performed

ANNUAL REPORT
2013
Summary of Weekly Bacteriological Sampling

Appendix C-1

Raw Water						
# of Detectable Results						
Adverse Quality Indicator (1)						
Month	Number of Samples	Total[1] Coliform	Fecal[1] Coliform	E-Coli[1]	Exceedence	Action Required
January	25	A	A	A	No	No
February	20	A	A	A	No	No
March	20	A	A	A	No	No
April	25	A	A	A	No	No
May	20	A	A	A	No	No
June	20	A	A	A	No	No
July	25	A	A	A	No	No
August	20	A	A	A	No	No
September	20	A	A	A	No	No
October*2	20	P	A	A	Yes	No
November	20	A	A	A	No	No
December	25	A	A	A	No	No
Annual	260				No	No

[1] There are no maximum or interim maximum acceptable concentrations for Coliforms, Fecal Coliforms, or E-Coli. Rather, the presence of any of these parameters in a drinking water sample indicates deteriorating or adverse water quality.The detection of an adverse indicator in an unchlorinated raw water sample that will be subject to the treatment process poses no significant risk to human health.

A Absent
P Prescence

*2: Sample collected on 15/10/13 yeilded a prescence of Total Coliform. Aditional Sample collected on 24/10/13 yielded an absent result.

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Summary of Weekly Bacteriological Sampling

Appendix C-2

Treated Water Reservoir									
# of Detectable Results									
Adverse Quality Indicator[1]									
Month	Number of Samples	Total[1] Coliforms	Fecal[1] Coliforms	E-Coli[1]	H.P.C. Number of Tests	Range of Results C.F.U. / 100 ml		Exceedence	Action Required
						Minimum	Maximum		
January	5	A	A	A	5	0	1	N	N
February	4	A	A	A	4	0	1	N	N
March	4	A	A	A	4	0	0	N	N
April	5	A	A	A	5	0	0	N	N
May	4	A	A	A	4	0	0	N	N
June	4	A	A	A	4	0	1	N	N
July	5	A	A	A	5	0	0	N	N
August	4	A	A	A	4	0	0	N	N
September	4	A	A	A	4	0	4	N	N
October	4	A	A	A	4	0	1	N	N
November	4	A	A	A	4	0	0	N	N
December	5	A	A	A	5	0	0	N	N
Annual	52	A	A	A	52	0	4	N	N

[1] There are no maximum or interim maximum acceptable concentrations for Coliforms, Fecal Coliforms, or E-Coli. Rather, the presence of any of these parameters in a drinking water sample indicates deteriorating or adverse water quality.

A Absent
P Present

ANNUAL REPORT
2013
Summary of Weekly Bacteriological Sampling

Appendix C-3

Distribution System									
Number of Detectable Results									
Adverse Quality Indicators [1]									
Month	Number of Samples	Total[1] Coliforms	Fecal[1] Coliforms	E-Coli[1]	H.P.C. Number of Tests	Range of Results C.F.U. / 100 ml		Exceedence	Action Required
						Minimum	Maximum		
January	20	A	A	A	20	0	2	N	N
February	16	A	A	A	16	0	6	N	N
March	16	A	A	A	16	0	2	N	N
April	20	A	A	A	20	0	11	N	N
May	16	A	A	A	16	0	8	N	N
June	16	A	A	A	16	0	184	N	N
July	20	A	A	A	20	0	19	N	N
August	16	A	A	A	16	0	5	N	N
September	16	A	A	A	16	0	1	N	N
October	16	A	A	A	16	0	12	N	N
November	16	A	A	A	16	0	31	N	N
December	20	A	A	a	20	0	1	N	N
Annual	208				208	0	184	N	N

[1] There are no maximum or interim maximum acceptable concentrations for Coliforms,Fecal Coliforms, or E-Coli. Rather, the presence of any of these parameters in a drinking water sample indicates deteriorating or adverse water quality.

A Absent
P Present

ANNUAL REPORT
2013
Summary of Laboratory Testing and Operational Parameters

Appendix D1-a

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Range of Results N.T.U			Exceedence	Action Required
				Average	Minimum	Maximum		
Turbidity	1 N.T.U	January	62	0.206	0.15	0.29	N	N
		February	56	0.199	0.14	0.28	N	N
		March	62	0.225	0.01	0.33	N	N
		April	60	0.241	0.13	0.36	N	N
		May	62	0.201	0.13	0.33	N	N
		June	60	0.178	0.09	0.29	N	N
		July	62	0.152	0.09	0.24	N	N
		August	62	0.159	0.08	0.28	N	N
		September	60	0.180	0.11	0.30	N	N
		October	62	0.297	0.19	0.41	N	N
		November	60	0.296	0.21	0.42	N	N
		December	62	0.217	0.14	0.37	N	N
		Annual	730	0.212	0.01	0.42	N	N

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2013
Summary of Laboratory Testing and Operational Parameters

Appendix D1-b

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Range of Results T.C.U.			Exceedence	Action Required
				Average	Minimum	Maximum		
Colour	5 T.C.U.	January	62	0.0	0.0	0.0	No	No
		February	56	0.0	0.0	0.0	No	No
		March	62	0.0	0.0	0.0	No	No
		April	60	0.0	0.0	0.0	No	No
		May	62	0.0	0.0	0.0	No	No
		June	60	0.0	0.0	0.0	No	No
		July	62	0.0	0.0	0.0	No	No
		August	62	0.0	0.0	0.0	No	No
		September	60	0.0	0.0	0.0	No	No
		October	62	0.0	0.0	0.0	No	No
		November	60	0.0	0.0	0.0	No	No
		December	62	0.0	0.0	0.0	No	No
		Annual	730	0.0	0.0	0.0	No	No

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Summary of Laboratory Testing and Operational Parameters

Appendix D1-c

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Average °C	Exceedence	Action Required
Temperature	4°C to 15°C	January	62	6.8	No	No
		February	56	6.8	No	No
		March	62	7.0	No	No
		April	60	7.0	No	No
		May	62	7.2	No	No
		June	60	7.6	No	No
		July	62	7.9	No	No
		August	62	7.9	No	No
		September	60	7.8	No	No
		October	62	7.6	No	No
		November	60	7.2	No	No
		December	62	6.8	No	No
		Annual	730	7.3	No	No

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Summary of Laboratory Testing and Operational Parameters

Appendix D1-d

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Average	Exceedence	Action Required
pH	6.5 to 8.5	January	62	7.7	No	No
		February	56	7.6	No	No
		March	62	7.7	No	No
		April	60	7.6	No	No
		May	62	7.6	No	No
		June	60	7.7	No	No
		July	62	7.7	No	No
		August	62	7.8	No	No
		September	60	7.8	No	No
		October	62	7.7	No	No
		November	60	7.8	No	No
		December	62	7.7	No	No
		Annual	730	7.7	No	No

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Summary of Laboratory Testing and Operational Parameters

Appendix D1-e

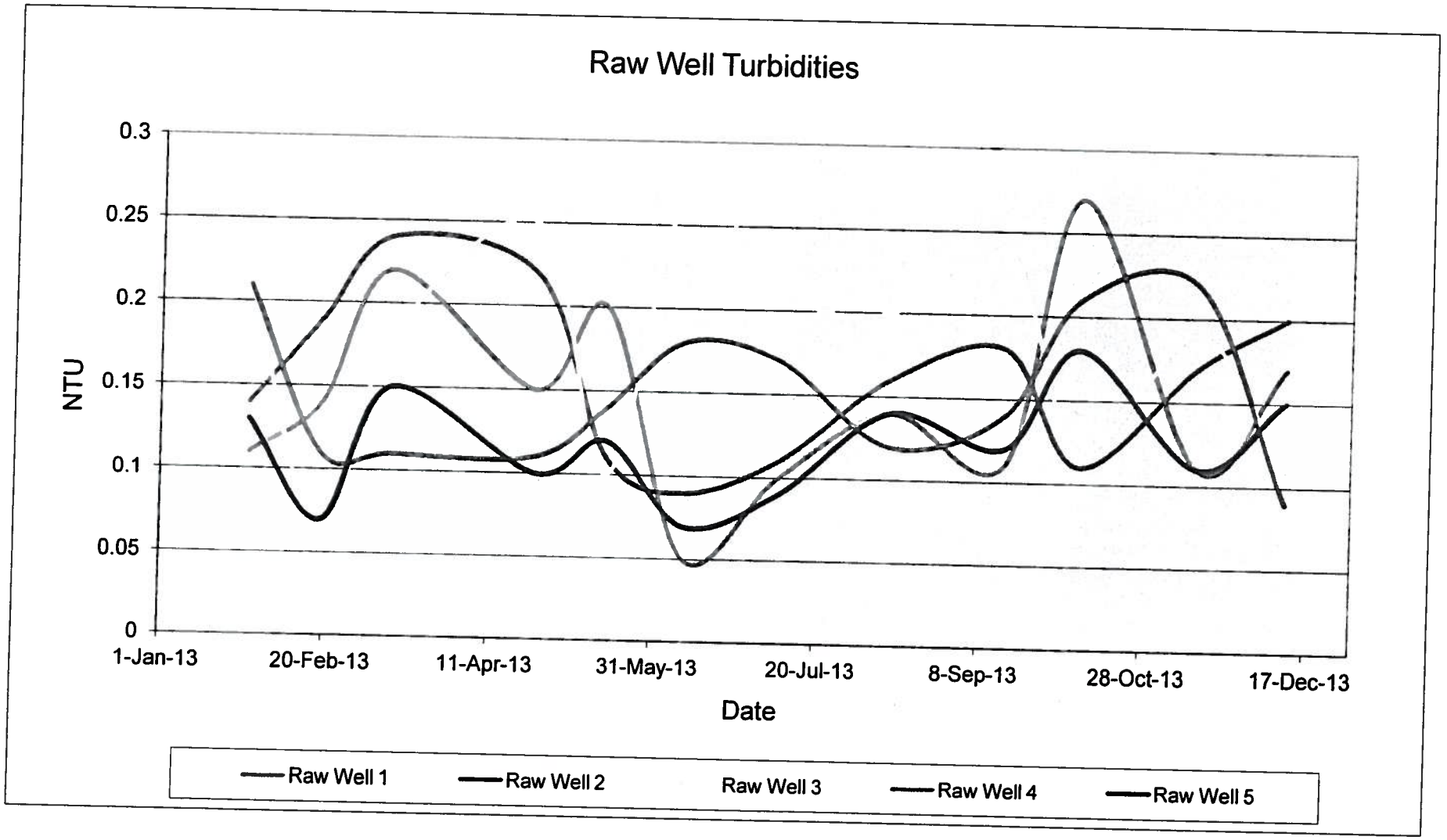
Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Range of Results mg/L			Exceedence	Action Required
				Average	Minimum	Maximum		
Free Chlorine Residual	0.05 mg/L (minium) to 4.00 mg/L (maximum)	January	62	0.98	0.85	1.18	No	No
		February	56	1.03	0.93	1.14	No	No
		March	62	0.91	0.67	1.04	No	No
		April	60	0.89	0.65	1.01	No	No
		May	62	0.90	0.75	1.00	No	No
		June	60	0.78	0.53	0.94	No	No
		July	62	0.96	0.69	1.15	No	No
		August	62	0.88	0.70	1.02	No	No
		September	60	1.00	0.73	1.22	No	No
		October	62	1.02	0.89	1.12	No	No
		November	60	1.12	0.98	1.25	No	No
		December	62	1.02	0.71	1.35	No	No
		Annual	730	0.96	0.53	1.35	No	No

(1) Ontario Spills Action Centre, Thunder Bay District Health Unit and Ministry of the Environment were informed.
Sodium Hypochlorite dosage rate increased until Free Chlorine Residual leaving the pumphouse was above 0.20 mg/L.
Distribution Samples taken to confirm that Free Chlorine Residual was 0.20 mg/L or greater.

2013
Annual Report
MonthlyTurbidity Readings

Appendix D1-g

Date	Raw Well 1 NTU	Raw Well 2 NTU	Raw Well 3 NTU	Raw Well 4 NTU	Raw Well 5 NTU
28-Jan-13	0.11	0.14	0.21	0.21	0.13
19-Feb-13	0.14	0.19	0.06	0.11	0.07
12-Mar-13	0.22	0.24	0.18	0.11	0.15
25-Apr-13	0.15	0.22	0.25	0.11	0.1
17-May-13	0.2	0.11	0.1	0.14	0.12
10-Jun-13	0.05	0.09	0.27	0.18	0.07
9-Jul-13	0.1	0.11	0.21	0.17	0.09
12-Aug-13	0.14	0.16	0.2	0.12	0.14
16-Sep-13	0.11	0.18	0.24	0.14	0.12
9-Oct-13	0.27	0.11	0.12	0.21	0.18
14-Nov-13	0.11	0.17	0.19	0.22	0.11
11-Dec-13	0.17	0.2	0.11	0.09	0.15
Min	**0.05**	**0.09**	**0.06**	**0.09**	**0.07**
Max	**0.27**	**0.24**	**0.27**	**0.22**	**0.18**
Average	**0.15**	**0.16**	**0.18**	**0.15**	**0.12**


Raw Well Turbidities
0.3
0.25
0.2
0.15
0.1
0.05
0
NTU
1-Jan-13
20-Feb-13
11-Apr-13
31-May-13
20-Jul-13
8-Sep-13
28-Oct-13
17-Dec-13
Date
Raw Well 1
Raw Well 2
Raw Well 3
Raw Well 4
Raw Well 5

ANNUAL REPORT
2013
Summary of Laboratory Testing and Operational Parameters

Appendix D1-g Zone 1 FC

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Range of Results mg/L			Exceedence	Action Required
				Average	Minimum	Maximum		
Free Chlorine Residual	0.05 mg/L (minium) to 4.00 mg/L (maximum)	January	31	0.90	0.70	1.06	No	No
		February	28	0.92	0.81	1.07	No	No
		March	31	0.85	0.68	0.98	No	No
		April	30	0.82	0.49	0.94	No	No
		May	31	0.83	0.71	0.93	No	No
		June	30	0.71	0.45	0.85	No	No
		July	31	0.86	0.52	1.06	No	No
		August	31	0.79	0.52	1.06	No	No
		September	30	0.82	0.47	1.20	No	No
		October	31	0.90	0.74	1.03	No	No
		November	30	1.03	0.89	1.18	No	No
		December	31	0.95	0.69	1.24	No	No
		Annual	365	0.86	0.45	1.24	No	No

(1) Ontario Spills Action Centre, Thunder Bay District Health Unit and Ministry of the Environment were informed.
Sodium Hypochlorite dosage rate increased until Free Chlorine Residual leaving the pumphouse was above 0.20 mg/L.
Distribution Samples taken to confirm that Free Chlorine Residual was 0.20 mg/L or greater.

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2013
Summary of Laboratory Testing and Operational Parameters

Appendix D1-g Zone 1 pH

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Average	Exceedence	Action Required
Distribution Zone #1 pH	6.5 to 8.5	January	31	7.8	No	No
		February	28	7.7	No	No
		March	31	7.8	No	No
		April	30	7.7	No	No
		May	31	7.7	No	No
		June	30	7.7	No	No
		July	31	7.7	No	No
		August	31	7.8	No	No
		September	30	7.8	No	No
		October	31	7.8	No	No
		November	30	7.8	No	No
		December	31	7.8	No	No
		Annual	365	7.8	No	No

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2013
Summary of Laboratory Testing and Operational Parameters

Appendix D1-g Zone 1 TC

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Range of Results mg/L			Exceedence	Action Required
				Average	Minimum	Maximum		
Total Chlorine Residual	0.05 mg/L (minium) to 4.00 mg/L (maximum)	January	31	1.07	0.84	1.24	No	No
		February	28	1.08	0.96	1.23	No	No
		March	31	1.00	0.82	1.11	No	No
		April	30	0.99	0.98	1.15	No	No
		May	31	0.99	0.83	1.11	No	No
		June	30	0.84	0.51	1.02	No	No
		July	31	0.98	0.64	1.25	No	No
		August	31	0.92	0.62	1.18	No	No
		September	30	0.97	0.55	1.50	No	No
		October	31	1.10	0.90	1.27	No	No
		November	30	1.20	1.02	1.36	No	No
		December	31	1.11	0.86	1.46	No	No
		Annual	365	1.02	0.51	1.50	No	No

(1) Ontario Spills Action Centre, Thunder Bay District Health Unit and Ministry of the Environment were informed.
Sodium Hypochlorite dosage rate increased until Free Chlorine Residual leaving the pumphouse was above 0.20 mg/L.
Distribution Samples taken to confirm that Free Chlorine Residual was 0.20 mg/L or greater.

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2013
Summary of Laboratory Testing and Operational Parameters

Appendix D1-g Zone 2 FC

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Range of Results mg/L			Exceedence	Action Required
				Average	Minimum	Maximum		
Distribution Zone 2 Free Chlorine Residual	0.05 mg/L (minium) to 4.00 mg/L (maximum)	January	31	0.86	0.73	0.98	No	No
		February	28	0.88	0.78	0.96	No	No
		March	31	0.81	0.61	0.94	No	No
		April	30	0.79	0.55	0.87	No	No
		May	31	0.80	0.66	0.97	No	No
		June	30	0.67	0.36	0.82	No	No
		July	31	0.76	0.55	1.04	No	No
		August	31	0.69	0.52	0.93	No	No
		September	30	0.78	0.53	1.03	No	No
		October	31	0.69	0.49	0.96	No	No
		November	30	0.83	0.69	1.06	No	No
		December	31	0.80	0.56	1.16	No	No
		Annual	365	0.78	0.36	1.16	No	No

(1) Ontario Spills Action Centre, Thunder Bay District Health Unit and Ministry of the Environment were informed.
Sodium Hypochlorite dosage rate increased until Free Chlorine Residual leaving the pumphouse was above 0.20 mg/L.
Distribution Samples taken to confirm that Free Chlorine Residual was 0.20 mg/L or greater.

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Summary of Laboratory Testing and Operational Parameters

Appendix D1-g Zone 2 pH

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Average	Exceedence	Action Required
Distribution Zone #2 pH	6.5 to 8.5	January	31	7.8	No	No
		February	28	7.8	No	No
		March	31	7.8	No	No
		April	30	7.7	No	No
		May	31	7.7	No	No
		June	30	7.7	No	No
		July	31	7.7	No	No
		August	31	7.8	No	No
		September	30	7.8	No	No
		October	31	7.8	No	No
		November	30	7.8	No	No
		December	31	7.8	No	No
		Annual	365	7.8	No	No

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Summary of Laboratory Testing and Operational Parameters

Appendix D1-g Zone 2 TC

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Range of Results mg/L			Exceedence	Action Required
				Average	Minimum	Maximum		
Distribution Zone 2 Total Chlorine Residual	0.05 mg/L (minium) to 4.00 mg/L (maximum)	January	31	1.03	0.88	0.82	No	No
		February	28	1.04	0.95	1.17	No	No
		March	31	0.96	0.79	1.13	No	No
		April	30	0.96	0.71	1.10	No	No
		May	31	0.95	0.77	1.04	No	No
		June	30	0.81	0.56	0.96	No	No
		July	31	0.87	0.67	1.12	No	No
		August	31	0.80	0.65	1.09	No	No
		September	30	0.91	0.60	1.22	No	No
		October	31	0.83	0.60	1.13	No	No
		November	30	0.97	0.80	1.24	No	No
		December	31	0.96	0.81	1.33	No	No
		Annual	365	0.92	0.56	1.33	No	No

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2013
Summary of Laboratory Testing and Operational Parameters

Appendix D1-g Zone 3 FC

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Range of Results mg/L			Exceedence	Action Required
				Average	Minimum	Maximum		
Distribution Zone 3 Free Chlorine Residual	0.05 mg/L (minium) to 4.00 mg/L (maximum)	January	31	0.78	0.69	0.95	No	No
		February	28	0.84	0.74	0.98	No	No
		March	31	0.78	0.61	0.86	No	No
		April	30	0.74	0.52	0.87	No	No
		May	31	0.73	0.65	0.88	No	No
		June	30	0.58	0.34	0.69	No	No
		July	31	0.60	0.39	0.88	No	No
		August	31	0.54	0.26	0.79	No	No
		September	30	0.57	0.22	0.74	No	No
		October	31	0.61	0.44	0.72	No	No
		November	30	0.86	0.71	0.96	No	No
		December	31	0.82	0.62	1.07	No	No
		Annual	365	0.70	0.22	1.07	No	No

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Summary of Laboratory Testing and Operational Parameters

Appendix D1-g Zone 3 pH

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Average	Exceedence	Action Required
Distribution Zone #3 pH	6.5 to 8.5	January	31	7.8	No	No
		February	28	7.7	No	No
		March	31	7.8	No	No
		April	30	7.7	No	No
		May	31	7.7	No	No
		June	30	7.7	No	No
		July	31	7.8	No	No
		August	31	7.8	No	No
		September	30	7.8	No	No
		October	31	7.8	No	No
		November	30	7.8	No	No
		December	31	7.8	No	No
		Annual	365	7.8	No	No

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Summary of Laboratory Testing and Operational Parameters

Appendix D1-g Zone 3 TC

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Range of Results mg/L			Exceedence	Action Required
				Average	Minimum	Maximum		
Distribution Zone 3 Total Chlorine Residual	0.05 mg/L (minium) to 4.00 mg/L (maximum)	January	31	0.93	0.80	1.12	No	No
		February	28	0.99	0.89	1.08	No	No
		March	31	0.92	0.78	1.02	No	No
		April	30	0.89	0.63	0.99	No	No
		May	31	0.88	0.79	0.98	No	No
		June	30	0.70	0.47	0.86	No	No
		July	31	0.70	0.47	1.04	No	No
		August	31	0.65	0.34	0.90	No	No
		September	30	0.68	0.30	0.87	No	No
		October	31	0.74	0.62	0.91	No	No
		November	30	1.01	0.82	1.18	No	No
		December	31	0.97	0.74	1.22	No	No
		Annual	365	0.63	0.30	1.22	No	No

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Summary of Laboratory Testing and Operational Parameters

Appendix D1-g Zone 4 FC

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Range of Results mg/L			Exceedence	Action Required
				Average	Minimum	Maximum		
Distribution Zone 4 Free Chlorine Residual	0.05 mg/L (minium) to 4.00 mg/L (maximum)	January	31	0.84	0.70	1.06	No	No
		February	28	0.89	0.76	1.00	No	No
		March	31	0.82	0.63	0.97	No	No
		April	30	0.80	0.50	0.88	No	No
		May	31	0.79	0.70	0.94	No	No
		June	30	0.79	0.56	1.02	No	No
		July	31	0.77	0.54	0.99	No	No
		August	31	0.70	0.53	1.09	No	No
		September	30	0.83	0.57	1.08	No	No
		October	31	0.82	0.63	0.91	No	No
		November	30	0.93	0.83	1.13	No	No
		December	31	0.84	0.62	1.07	No	No
		Annual	365	0.82	0.50	1.13	No	No

(1) Ontario Spills Action Centre, Thunder Bay District Health Unit and Ministry of the Environment were informed.
Sodium Hypochlorite dosage rate increased until Free Chlorine Residual leaving the pumphouse was above 0.20 mg/L.
Distribution Samples taken to confirm that Free Chlorine Residual was 0.20 mg/L or greater.

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Summary of Laboratory Testing and Operational Parameters

Appendix D1-g Zone 4 pH

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Average	Exceedence	Action Required
Distribution Zone #4 pH	6.5 to 8.5	January	31	7.8	No	No
		February	28	7.7	No	No
		March	31	7.8	No	No
		April	30	7.7	No	No
		May	31	7.7	No	No
		June	30	7.7	No	No
		July	31	7.8	No	No
		August	31	7.8	No	No
		September	30	7.8	No	No
		October	31	7.8	No	No
		November	30	7.8	No	No
		December	31	7.8	No	No
		Annual	365	7.8	No	No

ANNUAL REPORT
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Summary of Laboratory Testing and Operational Parameters

Appendix D1-g Zone 4 TC

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Range of Results mg/L			Exceedence	Action Required
				Average	Minimum	Maximum		
Distribution Zone 4 Total Chlorine Residual	0.05 mg/L (minium) to 4.00 mg/L (maximum)	January	31	1.02	0.85	1.40	No	No
		February	28	1.04	0.90	1.15	No	No
		March	31	0.98	0.79	1.13	No	No
		April	30	0.95	0.69	1.07	No	No
		May	31	0.94	0.81	1.10	No	No
		June	30	0.79	0.56	1.02	No	No
		July	31	0.89	0.63	1.17	No	No
		August	31	0.83	0.61	1.24	No	No
		September	30	0.97	0.68	1.27	No	No
		October	31	0.98	0.85	1.12	No	No
		November	30	1.09	0.98	1.30	No	No
		December	31	0.99	0.74	1.23	No	No
		Annual	365	0.63	0.56	1.40	No	No

ANNUAL REPORT
2013
Summary of Daily On-Line Instrumentation

Appendix D2-a

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Range of Results N.T.U			Exceedence	Action Required
				Average	Minimum	Maximum		
Turbidity	1 N.T.U	January	62	0.111	0.009	0.148	No	No
Hach 1720D Turbidimeter		February	56	0.127	0.085	1.190	No	No
		March	62	0.122	0.092	0.226	No	No
		April	60	0.099	0.079	0.120	No	No
		May	62	0.133	0.088	0.390	No	No
		June	60	0.118	0.077	0.191	No	No
		July	62	0.098	0.075	0.134	No	No
		August	62	0.093	0.075	0.120	No	No
		September	60	0.109	0.082	0.239	No	No
		October	62	0.193	0.128	0.649	No	No
		November	60	0.189	0.136	0.234	No	No
		December	62	0.150	0.086	1.000	No	No
		Annual	730	0.128	0.009	1.190	No	No

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Summary of Daily On-Line Instrumentation

Appendix D2-b

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Range of Results (mg/L) Average	Range of Results (mg/L) Minimum	Range of Results (mg/L) Maximum	Exceedence	Action Required
Chlorine Residual Hach CL17 Free Chlorine Analyzer	0.05 mg/L (minimum) to 4.00 mg/L (maximum)	January	62	1.03	0.89	1.20	No	No
		February	56	1.08	1.01	1.19	No	No
		March	62	0.95	0.70	1.07	No	No
		April	60	0.94	0.68	1.05	No	No
		May	62	0.97	0.89	1.10	No	No
		June	60	0.81	0.53	0.96	No	No
		July	62	1.03	0.72	1.22	No	No
		August	62	0.93	0.73	1.13	No	No
		September	60	1.06	0.77	1.34	No	No
		October	62	1.07	0.90	1.22	No	No
		November	60	1.20	1.06	1.34	No	No
		December	62	1.06	0.69	1.48	No	No
		Annual	730	1.01	0.53	1.48	No	No

(1)The Ontario Spills Action Centre, Thunder Bay District Health Unit and the Ministry of Environment must be notified.
Chlorine dosage rate is increased to return Free Chlorine Residual to 0.20 mg/L leaving the Treatment Plant.
Distribution Samples are taken to confirm Free Chlorine is greater than 0.20 mg/L or higher.

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Summary of Daily On-Line Instrumentation

Appendix D2-c

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Average	Exceedence	Action Required
pH	6.5 to 8.5	January	62	7.71	No	No
Hach EC 310		February	56	7.68	No	No
		March	62	7.72	No	No
		April	60	7.67	No	No
		May	62	7.67	No	No
		June	60	7.70	No	No
		July	62	7.71	No	No
		August	62	7.60	No	No
		September	60	7.62	No	No
		October	62	7.57	No	No
		November	60	7.65	No	No
		December	62	7.64	No	No
		Annual	730	7.66	No	No

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Summary of Daily On-Line Instrumentation

Appendix D2-d

Parameter	M.A.C. or I.M.A.C.	Month	Number of Samples	Average °C	Exceedence	Action Required
Temperature Hach EC 310	4 °C to 15 °C	January	62	7.1	No	No
		February	56	7.2	No	No
		March	62	7.3	No	No
		April	60	7.3	No	No
		May	62	7.3	No	No
		June	60	7.7	No	No
		July	62	8.0	No	No
		August	62	8.1	No	No
		September	60	8.0	No	No
		October	62	7.8	No	No
		November	60	7.4	No	No
		December	62	7.0	No	No
		Annual	730	7.5	No	No

Annual UV Treatment
2013
Dosage

Appendix D2E

Date	Well#1 & 2			Well # 3 & 4			Well #5		
	min	max	average	min	max	average	min	max	average
January	0	264	145	0	80	64	0	198	41
February	0	173	107	0	117	70	0	264	86
March	0	121	79	0	160	83	0	242	84
April	0	99	80	0	193	133	0	169	57
May	0	278	99	0	435	118	0	119	57
June	0	351	116	0	593	74	0	302	64
July	0	302	76	0	605	112	0	242	64
August	0	339	92	0	46	10	0	326	71
September	0	488	70	0	66	12	0	411	129
October	0	155	69	0	55	6	0	460	124
November	0	121	64	0	460	163	0	213	121
December	0	88	69	0	343	221	0	314	88
Annual (min, max, Average)	0	488	89	0	605	89	0	460	82

UV Dose are measured using mJ/cm2 units. Zero reading are measured during well shut down and the average is based on up to 10 000 readings. These reactors are designed to achieve maximum inactivation at a minimum dosage rate of 42 mJ/cm2

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SUMMARY OF MONTHLY FLOWS & COMPLIANCE SHEET - WATER

APPENDIX E-1

YEAR 2013	WELL 1	WELL 2	WELL 3	WELL 4	WELL 5	WELL FIELD	RAW	TREATED	PERCENTAGE	PERCENTAGE	PERCENTAGE
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	RAW WATER	TREATED WATER	RAW WATER
MONTH	m3	m3	m3	m3	m3	m3	m3	m3	WELL FIELD	WELL FIELD	TREATED WATER
JANUARY	2626.80	13443.15	5826.97	6280.06	2611.32	30788.30	30344.51	28919.42	-1.46	-6.07	-4.93
FEBRUARY	5460.39	1313.19	5243.86	2682.83	14113.41	28813.68	28783.73	27453.43	-0.10	-4.72	-4.85
MARCH	7301.90	1426.70	13649.52	707.92	10496.40	33582.44	33613.17	31840.13	0.09	-5.19	-5.57
APRIL	2748.22	15503.80	202.84	7441.01	7479.18	33375.05	33335.44	31696.62	-0.12	-5.03	-5.17
MAY	4608.06	8877.75	134.35	4551.17	13786.94	31958.27	32419.61	30999.29	1.42	-3.00	-4.58
JUNE	3844.97	7536.67	1775.05	3123.56	10431.70	26711.95	26611.89	26416.24	-0.38	-1.11	-0.74
JULY	746.11	787.09	1023.86	8528.55	18286.58	29372.19	29372.21	28898.74	0.00	-1.61	-1.64
AUGUST	488.03	8169.50	298.36	3309.55	14858.60	27124.04	27523.54	26819.63	1.45	-1.12	-2.62
SEPTEMBER	1345.18	7997.86	1527.74	1865.11	8845.14	21581.03	21612.33	20863.67	0.14	-3.32	-3.59
OCTOBER	1300.78	11619.05	311.99	560.82	4920.75	18713.39	18442.00	18155.96	-1.47	-2.98	-1.58
NOVEMBER	2390.22	480.61	179.15	3198.88	13633.31	19882.17	20039.28	19255.80	0.78	-3.15	-4.07
DECEMBER	5581.95	3057.72	12323.80	596.94	1788.97	23349.38	22766.12	22518.45	-2.56	-3.56	-1.10
ANNUAL	38442.61	80213.09	42497.49	42846.40	121252.30	325251.89	324863.83	313837.38	-0.12	-3.51	-3.51

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ACTUAL DAILY FLOWS & COMPLIANCE SHEET - WATER

APPENDIX E-2

Month	Year	WELL 1	WELL 2	WELL 3	WELL 4	WELL 5	WELL FIELD	RAW	TREATED	PERCENTAGE	PERCENTAGE	PERCENTAGE
January	2013	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	RAW WATER WELL FIELD	TREATED WATER WELL FIELD	RAW WATER TREATED WATER
DATE	DAY	m3	m3	m3	m3	m3	m3	m3	m3			
1	Tuesday	215.89	0.17	530.73	0.00	0.06	746.85	696.46	790.96	-7.24	5.91	11.95
2	Wednesday	244.72	24.50	593.51	4.98	10.55	878.26	819.96	731.85	-7.11	-16.67	-12.04
3	Thursday	196.29	0.17	500.66	7.96	16.98	722.06	681.23	743.18	-5.99	2.92	8.34
4	Friday	243.00	0.17	598.68	0.00	0.17	842.02	783.86	721.12	-7.42	-14.36	-8.70
5	Saturday	228.55	0.17	564.50	0.00	0.09	793.31	781.23	784.82	-1.55	-1.07	0.46
6	Sunday	253.59	0.17	625.26	0.00	0.10	879.12	819.23	820.76	-7.31	-6.64	0.19
7	Monday	32.05	423.66	78.17	211.40	9.97	755.25	752.39	738.00	-0.38	-2.28	-1.95
8	Tuesday	0.04	369.61	0.01	234.31	99.50	703.47	656.23	729.50	-7.20	3.70	10.04
9	Wednesday	0.04	409.05	0.05	206.54	226.01	841.69	825.33	727.40	-1.98	-13.58	-13.46
10	Thursday	0.05	507.39	0.00	255.04	0.19	762.67	768.71	741.14	0.79	-2.82	-3.72
11	Friday	0.04	436.07	0.04	220.90	44.80	701.85	700.27	716.18	-0.23	2.04	2.22
12	Saturday	0.04	595.09	0.01	298.93	0.19	894.26	901.42	820.01	0.79	-8.30	-9.93
13	Sunday	10.20	561.61	0.05	267.55	53.98	893.39	895.16	818.99	0.20	-8.33	-9.30
14	Monday	0.03	403.39	49.08	228.67	53.76	734.93	757.48	751.93	2.98	2.31	-0.74
15	Tuesday	0.04	777.56	0.00	391.51	0.10	1169.21	1185.79	844.23	1.40	-27.79	-40.46
16	Wednesday	0.03	511.41	0.00	257.18	0.14	768.76	761.66	751.72	-0.93	-2.22	-1.32
17	Thursday	0.03	844.21	0.00	424.49	0.08	1268.81	1227.22	1187.33	-3.39	-6.42	-3.36
18	Friday	0.01	624.71	0.00	315.43	0.07	940.22	910.32	800.16	-3.28	-14.90	-13.77
19	Saturday	0.00	534.13	0.00	269.13	0.02	803.28	796.15	842.02	-0.90	4.82	5.45
20	Sunday	0.00	643.02	0.00	324.35	0.10	967.47	943.91	888.06	-2.50	-8.21	-6.29
21	Monday	8.43	1087.06	26.13	546.48	20.54	1688.64	1677.26	1619.12	-0.68	-4.12	-3.59
22	Tuesday	8.96	1304.46	0.00	654.71	0.00	1968.13	1960.07	1862.15	-0.41	-5.38	-5.26
23	Wednesday	0.00	1183.72	635.92	224.85	.19.44	2044.49	2133.15	1899.45	4.16	-7.09	-12.30
24	Thursday	0.00	971.74	303.12	306.28	0.10	1581.24	1610.49	1475.36	1.82	-6.70	-9.16
25	Friday	0.00	596.55	0.00	299.84	0.01	896.40	884.83	865.92	-1.31	-3.40	-2.18
26	Saturday	5.38	567.07	10.68	285.06	0.01	868.20	879.34	886.25	1.27	2.08	0.78
27	Sunday	299.60	23.36	753.09	7.45	9.35	1092.85	1030.08	904.77	-6.09	-17.21	-13.85
28	Monday	200.22	9.88	525.27	20.85	43.90	800.12	761.61	825.30	-5.06	3.15	7.72
29	Tuesday	192.79	32.71	32.01	16.17	582.62	856.30	851.92	863.51	-0.51	0.84	1.34
30	Wednesday	248.84	0.17	0.00	0.00	733.61	982.62	963.44	881.58	-1.99	-10.28	-9.29
31	Thursday	237.94	0.17	0.00	0.00	704.32	942.43	928.31	886.65	-1.52	-5.92	-4.70
	TOTALS	2626.80	13443.15	5826.97	6280.06	2611.32	30788.30	30344.51	28919.42	-1.46	-6.07	-4.93

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ACTUAL DAILY FLOWS & COMPLIANCE SHEET - WATER

APPENDIX E-3

Month	Year	WELL 1	WELL 2	WELL 3	WELL 4	WELL 5	WELL FIELD	RAW	TREATED	PERCENTAGE	PERCENTAGE	PERCENTAGE
February	2013	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	RAW WATER WELL FIELD	TREATED WATER WELL FIELD	RAW WATER TREATED WATER
DATE	DAY	m3	m3	m3	m3	m3	m3	m3	m3			
1	Friday	218.29	0.17	0.00	0.00	645.95	864.41	864.40	872.91	0.00	0.98	0.97
2	Saturday	256.43	0.17	0.00	0.00	758.06	1014.66	1014.66	962.96	0.00	-5.10	-5.37
3	Sunday	264.65	18.78	0.00	0.00	764.36	1047.79	1047.77	982.02	0.00	-6.28	-6.70
4	Monday	226.73	0.17	42.47	22.00	667.63	959.00	959.27	918.19	0.03	-4.26	-4.47
5	Tuesday	250.36	0.17	0.00	0.00	739.74	990.27	990.28	926.49	0.00	-6.44	-6.89
6	Wednesday	45.02	521.84	0.00	262.48	132.97	962.31	962.31	947.24	0.00	-1.57	-1.59
7	Thursday	0.00	608.13	0.02	306.29	64.84	979.28	979.29	960.55	0.00	-1.91	-1.95
8	Friday	0.00	99.11	0.50	321.94	536.21	957.76	957.76	934.51	0.00	-2.43	-2.49
9	Saturday	0.06	0.17	0.55	379.72	757.00	1137.50	1137.49	1015.50	0.00	-10.73	-12.01
10	Sunday	0.13	0.17	0.59	331.15	659.76	991.80	991.80	1013.89	0.00	2.23	2.18
11	Monday	6.02	18.56	54.16	316.17	631.36	1026.27	996.26	957.32	-3.01	-6.72	-4.07
12	Tuesday	0.13	0.17	0.55	319.64	636.69	957.18	957.18	946.51	0.00	-1.11	-1.13
13	Wednesday	0.12	0.17	0.48	348.82	694.81	1044.40	1044.40	963.89	0.00	-7.71	-8.35
14	Thursday	267.47	0.17	661.42	33.48	67.14	1029.68	1029.67	975.37	0.00	-5.27	-5.57
15	Friday	298.23	0.17	738.79	0.00	0.16	1037.35	1037.34	941.71	0.00	-9.22	-10.15
16	Saturday	302.15	0.17	749.42	0.00	0.13	1051.87	1051.86	1022.06	0.00	-2.83	-2.92
17	Sunday	335.32	0.17	830.33	0.00	0.09	1165.91	1165.90	1025.96	0.00	-12.00	-13.64
18	Monday	287.02	22.06	693.42	0.00	0.06	1002.56	1002.57	1017.04	0.00	1.44	1.42
19	Tuesday	291.80	0.17	765.79	23.58	22.83	1104.17	1104.17	958.46	0.00	-13.20	-15.20
20	Wednesday	271.34	0.17	671.05	0.00	0.11	942.67	942.67	972.48	0.00	3.16	3.07
21	Thursday	255.67	0.17	0.03	0.00	753.83	1009.70	1009.71	960.30	0.00	-4.89	-5.15
22	Friday	249.11	0.17	0.00	0.00	735.63	984.91	984.90	923.48	0.00	-6.24	-6.65
23	Saturday	264.80	0.17	0.00	0.00	781.90	1046.87	1046.86	997.44	0.00	-4.72	-4.95
24	Sunday	360.38	0.17	0.00	0.00	1064.52	1425.07	1425.07	1291.96	0.00	-9.34	-10.30
25	Monday	258.22	0.17	0.00	0.00	763.91	1022.30	1022.30	993.96	0.00	-2.77	-2.85
26	Tuesday	229.92	21.14	34.29	17.56	693.91	996.82	996.69	974.83	-0.01	-2.21	-2.24
27	Wednesday	264.16	0.17	0.00	0.00	780.62	1044.95	1044.95	997.65	0.00	-4.53	-4.74
28	Thursday	256.86	0.17	0.00	0.00	759.19	1016.22	1016.20	998.75	0.00	-1.72	-1.75
	TOTALS	5460.39	1313.19	5243.86	2682.83	14113.41	28813.68	28783.73	27453.43	-0.10	-4.72	-4.85

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ACTUAL DAILY FLOWS & COMPLIANCE SHEET - WATER

APPENDIX E-4

Month March	Year 2013	WELL 1 FLOW	WELL 2 FLOW	WELL 3 FLOW	WELL 4 FLOW	WELL 5 FLOW	WELL FIELD FLOW	RAW FLOW	TREATED FLOW	PERCENTAGE RAW WATER WELL FIELD	PERCENTAGE TREATED WATER WELL FIELD	PERCENTAGE RAW WATER TREATED WATER
DATE	DAY	m3	m3	m3	m3	m3	m3	m3	m3			
1	Friday	242.00	0.17	0.02	114.06	716.91	1073.16	1104.00	998.81	2.79	-6.93	-10.53
2	Saturday	253.25	0.17	0.01	63.01	746.62	1063.06	1063.06	1041.63	0.00	-2.02	-2.06
3	Sunday	274.78	0.17	0.00	0.00	812.44	1087.39	1087.38	1031.40	0.00	-5.15	-5.43
4	Monday	225.36	31.91	23.55	11.97	662.40	955.19	955.18	937.09	0.00	-1.89	-1.93
5	Tuesday	256.45	0.17	0.00	0.00	759.69	1016.31	1016.31	961.37	0.00	-5.41	-5.71
6	Wednesday	257.47	0.17	0.00	0.00	758.30	1015.94	1015.94	940.41	0.00	-7.43	-8.03
7	Thursday	230.18	0.17	0.00	0.00	678.81	909.16	909.16	948.80	0.00	4.36	4.18
8	Friday	225.94	0.17	475.53	223.71	98.74	1024.09	1024.08	912.92	0.00	-10.86	-12.18
9	Saturday	289.26	0.17	715.53	0.00	0.14	1005.10	1005.10	984.82	0.00	-2.02	-2.06
10	Sunday	305.21	0.17	753.40	0.00	0.14	1058.92	1058.91	973.92	0.00	-8.03	-8.73
11	Monday	262.04	45.45	670.77	24.27	18.22	1020.75	1020.74	936.13	0.00	-8.29	-9.04
12	Tuesday	237.46	38.92	590.57	18.19	38.69	923.83	923.83	923.74	0.00	-0.01	-0.01
13	Wednesday	262.71	46.09	650.00	31.03	38.53	1028.36	1028.35	923.17	0.00	-10.23	-11.39
14	Thursday	314.76	0.17	609.05	38.88	65.58	1028.44	1028.43	930.25	0.00	-9.55	-10.55
15	Friday	346.79	0.17	859.15	0.00	0.14	1206.25	1206.25	1132.59	0.00	-6.11	-6.50
16	Saturday	406.45	0.17	1007.44	0.00	0.11	1414.17	1414.16	1323.59	0.00	-6.41	-6.84
17	Sunday	421.76	0.17	1046.33	0.00	0.10	1468.36	1468.35	1383.59	0.00	-5.77	-6.13
18	Monday	304.84	0.17	822.02	36.84	34.13	1198.00	1204.94	1201.54	0.58	0.30	-0.28
19	Tuesday	322.43	7.11	800.24	0.00	0.13	1129.91	1122.97	977.54	-0.62	-13.49	-14.88
20	Wednesday	288.40	0.17	713.12	0.00	0.16	1001.85	1001.84	1031.75	0.00	2.98	2.90
21	Thursday	349.07	0.17	866.51	0.00	0.10	1215.85	1215.85	1091.70	0.00	-10.21	-11.37
22	Friday	302.07	0.17	745.60	0.00	0.07	1047.91	1047.91	993.48	0.00	-5.19	-5.48
23	Saturday	319.05	0.17	791.62	0.00	0.08	1110.92	1110.92	1018.14	0.00	-8.35	-9.11
24	Sunday	327.56	17.91	816.35	4.48	0.51	1166.81	1166.81	1058.76	0.00	-9.26	-10.21
25	Monday	273.32	0.17	692.10	28.59	10.78	1004.96	1004.96	990.27	0.00	-1.46	-1.48
26	Tuesday	0.02	541.28	0.03	0.01	541.40	1082.74	1082.74	999.12	0.00	-7.72	-8.37
27	Wednesday	0.02	540.44	0.00	0.00	541.09	1081.55	1081.56	1007.06	0.00	-6.89	-7.40
28	Thursday	0.03	153.86	0.24	112.88	750.84	1017.85	1017.84	985.92	0.00	-3.14	-3.24
29	Friday	0.02	0.17	0.05	0.00	1050.86	1051.10	1051.10	1067.33	0.00	1.54	1.52
30	Saturday	0.01	0.17	0.14	0.00	1091.12	1091.44	1091.43	1085.65	0.00	-0.53	-0.53
31	Sunday	3.19	0.16	0.15	0.00	1079.57	1083.07	1083.07	1047.64	0.00	-3.27	-3.38
	TOTALS	7301.90	1426.70	13649.52	707.92	10496.40	33582.44	33613.17	31840.13	0.09	-5.19	-5.57

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ACTUAL DAILY FLOWS & COMPLIANCE SHEET - WATER

APPENDIX E-5

Month APRIL	Year 2013	WELL 1 FLOW	WELL 2 FLOW	WELL 3 FLOW	WELL 4 FLOW	WELL 5 FLOW	WELL FIELD FLOW	RAW FLOW	TREATED FLOW	PERCENTAGE RAW WATER WELL FIELD	PERCENTAGE TREATED WATER WELL FIELD	PERCENTAGE RAW WATER TREATED WATER
DATE	DAY	m3	m3	m3	m3	m3	m3	m3	m3			
1	Monday	267.72	0.17	0.05	0.00	790.14	1058.08	1027.12	1039.55	-3.01	-1.75	1.20
2	Tuesday	251.86	28.63	28.87	14.72	757.04	1081.12	1070.87	1021.00	-0.96	-5.56	-4.88
3	Wednesday	265.44	0.17	0.00	0.00	786.01	1051.62	1041.76	1004.11	-0.95	-4.52	-3.75
4	Thursday	291.40	0.17	0.00	0.00	863.96	1155.53	1147.14	1126.21	-0.73	-2.54	-1.86
5	Friday	263.68	0.17	0.00	0.00	780.57	1044.42	1034.70	993.58	-0.94	-4.87	-4.14
6	Saturday	279.41	0.17	0.00	0.00	825.97	1105.55	1093.93	1066.21	-1.06	-3.56	-2.60
7	Sunday	309.40	0.17	0.00	0.00	918.68	1228.25	1221.22	1100.26	-0.58	-10.42	-10.99
8	Monday	242.64	25.96	51.05	26.27	748.36	1094.28	1083.46	1012.79	-1.00	-7.45	-6.98
9	Tuesday	272.00	0.17	0.00	0.00	804.09	1076.26	1064.94	1047.46	-1.06	-2.68	-1.67
10	Wednesday	0.01	681.42	0.00	342.70	0.00	1024.13	1009.84	1042.14	-1.42	1.76	3.10
11	Thursday	0.03	671.26	0.00	337.50	76.27	1085.06	1078.85	1035.83	-0.58	-4.54	-4.15
12	Friday	0.04	764.78	0.00	384.59	0.06	1149.47	1162.91	1024.34	1.16	-10.89	-13.53
13	Saturday	0.03	720.79	0.00	362.58	0.11	1083.51	1099.83	1091.42	1.48	0.73	-0.77
14	Sunday	13.39	852.04	0.00	405.84	0.19	1271.46	1284.51	1077.29	1.02	-15.27	-19.24
15	Monday	5.95	576.80	4.95	307.45	63.35	958.50	944.19	998.25	-1.52	4.15	5.42
16	Tuesday	0.02	714.37	16.87	372.23	18.16	1121.65	1129.93	1000.54	0.73	-10.80	-12.93
17	Wednesday	0.02	662.43	0.00	332.62	0.00	995.07	1004.04	1022.84	0.89	2.79	1.84
18	Thursday	0.03	767.87	0.00	386.05	0.00	1153.95	1167.67	1024.67	1.17	-11.20	-13.96
19	Friday	0.03	664.15	0.00	334.01	0.01	998.20	990.82	981.40	-0.74	-1.68	-0.96
20	Saturday	0.02	781.76	0.00	393.22	0.02	1175.02	1179.72	1083.45	0.40	-7.79	-8.89
21	Sunday	0.02	700.71	0.00	351.79	0.11	1052.63	1066.59	1076.77	1.31	2.29	0.95
22	Monday	0.02	803.39	0.00	404.99	0.14	1208.54	1224.31	1052.09	1.29	-12.95	-16.37
23	Tuesday	0.02	682.40	0.00	344.02	0.05	1026.49	1025.07	1065.38	-0.14	3.79	3.78
24	Wednesday	174.83	757.75	27.41	133.33	15.23	1108.55	1112.95	1066.37	0.40	-3.80	-4.37
25	Thursday	47.73	772.06	30.24	332.09	18.49	1200.61	1212.30	1083.73	0.96	-9.74	-11.86
26	Friday	0.03	718.59	0.00	363.43	0.00	1082.05	1069.98	1073.78	-1.13	-0.76	0.35
27	Saturday	0.03	813.21	0.00	409.02	0.01	1222.27	1218.12	1149.93	-0.34	-5.92	-5.93
28	Sunday	0.02	859.36	0.00	433.46	0.02	1292.86	1301.22	1195.54	0.64	-7.53	-8.84
29	Monday	62.38	724.95	43.40	287.04	12.12	1129.89	1118.57	1114.41	-1.01	-1.37	-0.37
30	Tuesday	0.02	757.93	0.00	382.06	0.02	1140.03	1148.88	1025.28	0.77	-10.07	-12.06
	TOTALS	2748.22	15503.80	202.84	7441.01	7479.18	33375.05	33335.44	31696.62	-0.12	-5.03	-5.17

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APPENDIX E-6

Month	Year	WELL 1	WELL 2	WELL 3	WELL 4	WELL 5	WELL FIELD	RAW	TREATED	PERCENTAGE	PERCENTAGE	PERCENTAGE
May	2013	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	RAW WATER	TREATED WATER	RAW WATER
DATE	DAY	m3	m3	m3	m3	m3	m3	m3	m3	WELL FIELD	WELL FIELD	TREATED WATER
1	Wednesday	0.02	700.62	0.00	353.43	0.00	1054.07	1046.08	1009.30	-0.76	-4.25	-3.64
2	Thursday	0.02	674.34	0.00	339.13	0.00	1013.49	1019.75	1044.75	0.61	3.08	2.39
3	Friday	0.02	774.87	0.00	390.20	0.00	1165.09	1158.25	1036.28	-0.59	-11.06	-11.77
4	Saturday	0.03	785.41	0.00	396.30	0.00	1181.74	1199.79	1110.45	1.50	-6.03	-8.05
5	Sunday	4.31	760.50	10.77	382.36	4.26	1162.20	1169.71	1154.00	0.64	-0.71	-1.36
6	Monday	0.03	727.21	11.98	373.82	8.68	1121.72	1135.50	1065.55	1.21	-5.01	-6.56
7	Tuesday	7.94	794.28	0.00	380.70	0.01	1182.93	1197.53	1074.87	1.22	-9.13	-11.41
8	Wednesday	0.05	692.56	0.00	348.68	0.00	1041.29	1075.21	1067.85	3.15	2.55	-0.69
9	Thursday	0.03	654.03	26.37	344.54	27.56	1052.53	1079.64	1029.80	2.51	-2.16	-4.84
10	Friday	0.02	710.01	0.01	358.27	0.10	1068.41	1092.59	995.77	2.21	-6.80	-9.72
11	Saturday	0.02	726.76	0.00	365.66	0.09	1092.53	1133.61	1078.00	3.62	-1.33	-5.16
12	Sunday	3.84	800.47	0.00	404.14	0.10	1208.55	1253.97	1093.33	3.62	-9.53	-14.69
13	Monday	186.56	2.87	37.83	81.04	666.08	974.38	994.57	1040.55	2.03	6.79	4.42
14	Tuesday	274.63	0.17	5.77	1.06	814.45	1096.08	1105.91	1045.71	0.89	-4.60	-5.76
15	Wednesday	283.67	0.17	0.00	0.00	840.76	1124.60	1142.59	1057.24	1.57	-5.99	-8.07
16	Thursday	270.11	0.17	0.04	8.79	798.43	1077.54	1079.03	1076.41	0.14	-0.10	-0.24
17	Friday	258.12	28.32	12.94	7.03	785.30	1091.71	1104.01	1082.96	1.11	-0.80	-1.94
18	Saturday	275.46	0.17	0.00	0.00	814.92	1090.55	1108.75	1101.73	1.64	1.03	-0.64
19	Sunday	291.31	0.22	0.00	0.00	859.84	1151.37	1162.72	1088.80	0.98	-5.43	-6.79
20	Monday	298.88	18.88	7.37	4.14	881.94	1211.21	1232.85	1143.25	1.76	-5.61	-7.84
21	Tuesday	201.38	0.17	0.06	0.09	596.89	798.59	814.47	855.95	1.95	7.18	4.85
22	Wednesday	206.22	0.17	0.00	0.00	608.44	814.83	825.83	796.18	1.33	-2.29	-3.72
23	Thursday	214.73	0.17	0.00	0.00	634.81	849.71	863.11	782.69	1.55	-7.89	-10.27
24	Friday	205.72	0.17	0.00	0.00	608.02	813.91	823.77	766.58	1.20	-5.82	-7.46
25	Saturday	202.18	0.17	0.00	0.00	599.28	801.63	816.44	852.23	1.81	6.31	4.20
26	Sunday	249.98	0.17	0.00	0.00	736.32	986.47	1001.10	904.87	1.46	-8.27	-10.63
27	Monday	202.14	23.94	21.21	11.79	630.92	890.00	900.83	850.94	1.20	-4.39	-5.86
28	Tuesday	244.57	0.17	0.00	0.00	722.40	967.14	970.70	990.01	0.37	2.36	1.95
29	Wednesday	230.77	0.17	0.00	0.00	681.97	912.91	921.83	960.22	0.97	5.18	4.00
30	Thursday	252.33	0.21	0.00	0.00	746.14	998.68	1009.37	947.48	1.06	-5.13	-6.53
31	Friday	242.97	0.21	0.00	0.00	719.23	962.41	980.10	895.54	1.80	-6.95	-9.44
	TOTALS	4608.06	8877.75	134.35	4551.17	13786.94	31958.27	32419.61	30999.29	1.42	-3.00	-4.58

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ACTUAL DAILY FLOWS & COMPLIANCE SHEET - WATER

APPENDIX E-7

Month June	Year 2013	WELL 1 FLOW	WELL 2 FLOW	WELL 3 FLOW	WELL 4 FLOW	WELL 5 FLOW	WELL FIELD FLOW	RAW FLOW	TREATED FLOW	PERCENTAGE RAW WATER WELL FIELD	PERCENTAGE TREATED WATER WELL FIELD	PERCENTAGE RAW WATER TREATED WATER
DATE	DAY	m3	m3	m3	m3	m3	m3	m3	m3			
1	Saturday	250.47	0.17	0.00	0.00	841.33	1091.97	991.96	964.89	-10.08	-11.64	-2.81
2	Sunday	200.32	12.52	3.14	1.65	610.64	828.27	828.26	847.72	0.00	2.35	2.30
3	Monday	193.31	0.17	5.09	2.92	578.76	780.25	780.25	780.97	0.00	0.09	0.09
4	Tuesday	208.41	0.17	0.00	0.00	614.98	823.56	823.56	813.77	0.00	-1.19	-1.20
5	Wednesday	238.02	0.17	0.00	0.00	703.77	941.96	941.96	897.75	0.00	-4.69	-4.92
6	Thursday	236.41	0.17	0.00	0.00	697.05	933.63	933.63	890.71	0.00	-4.60	-4.82
7	Friday	221.51	0.17	0.00	0.00	654.41	876.09	876.09	869.65	0.00	-0.74	-0.74
8	Saturday	260.90	0.17	0.00	0.00	771.05	1032.12	1032.11	963.40	0.00	-6.66	-7.13
9	Sunday	220.00	0.17	0.00	0.00	651.63	871.80	871.79	941.93	0.00	8.04	7.45
10	Monday	197.84	28.91	13.97	7.75	617.12	865.59	865.59	830.49	0.00	-4.06	-4.23
11	Tuesday	202.40	0.22	0.00	0.00	592.81	795.43	795.43	795.24	0.00	-0.02	-0.02
12	Wednesday	238.43	0.21	0.00	0.00	706.98	945.62	945.63	818.72	0.00	-13.42	-15.50
13	Thursday	200.12	0.17	0.00	0.00	592.22	792.51	792.51	840.08	0.00	6.00	5.66
14	Friday	217.27	0.17	0.00	0.00	638.33	855.77	855.76	841.01	0.00	-1.72	-1.75
15	Saturday	221.83	0.18	0.00	0.00	656.87	878.88	878.87	819.35	0.00	-6.77	-7.26
16	Sunday	0.04	514.18	0.00	259.46	0.00	773.68	773.68	819.26	0.00	5.89	5.56
17	Monday	6.42	450.28	81.38	269.91	88.06	896.05	896.05	837.04	0.00	-6.59	-7.05
18	Tuesday	0.03	600.27	0.05	292.51	34.08	926.94	926.94	868.30	0.00	-6.33	-6.75
19	Wednesday	0.05	518.55	43.59	261.60	45.11	868.90	868.91	864.07	0.00	-0.56	-0.56
20	Thursday	34.16	414.38	0.40	209.47	201.44	859.85	859.85	868.48	0.00	1.00	0.99
21	Friday	0.02	615.75	0.00	310.24	0.00	926.01	926.02	812.58	0.00	-12.25	-13.96
22	Saturday	0.01	348.79	0.00	325.30	0.06	674.16	674.17	1187.92	0.00	76.21	43.25
23	Sunday	0.02	832.44	0.00	0.00	0.00	832.46	832.46	846.41	0.00	1.68	1.65
24	Monday	5.90	795.44	20.38	232.35	11.88	1065.95	1065.95	991.07	0.00	-7.02	-7.56
25	Tuesday	0.02	677.82	0.00	342.70	0.00	1020.54	1020.53	1021.25	0.00	0.07	0.07
26	Wednesday	10.34	581.17	36.07	309.97	23.67	961.22	961.22	848.67	0.00	-11.71	-13.26
27	Thursday	0.04	516.05	0.00	260.55	0.00	776.64	776.63	839.67	0.00	8.12	7.51
28	Friday	0.01	490.97	270.11	37.18	99.09	897.36	897.36	865.43	0.00	-3.56	-3.69
29	Saturday	216.06	136.62	646.18	0.00	0.18	999.04	999.03	870.21	0.00	-12.90	-14.80
30	Sunday	264.61	0.22	654.69	0.00	0.18	919.70	919.69	960.20	0.00	4.40	4.22
	TOTALS	3844.97	7536.67	1775.05	3123.56	10431.70	26711.95	26611.89	26416.24	-0.38	-1.11	-0.74

ANNUAL REPORT
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ACTUAL DAILY FLOWS & COMPLIANCE SHEET - WATER

APPENDIX E-8

Month	Year	WELL 1	WELL 2	WELL 3	WELL 4	WELL 5	WELL FIELD	RAW	TREATED	PERCENTAGE	PERCENTAGE	PERCENTAGE
July	2013	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	RAW WATER	TREATED WATER	RAW WATER
DATE	DAY	m3	m3	m3	m3	m3	m3	m3	m3	WELL FIELD	WELL FIELD	TREATED WATER
1	Monday	307.39	22.93	762.83	8.27	14.61	1116.03	1116.04	999.72	0.00	-10.42	-11.64
2	Tuesday	317.04	47.71	58.75	34.96	581.13	1039.59	1039.59	1025.79	0.00	-1.33	-1.35
3	Wednesday	34.61	67.40	0.49	345.36	696.96	1144.82	1144.83	1092.44	0.00	-4.58	-4.80
4	Thursday	0.04	0.23	0.48	325.08	647.01	972.84	972.84	997.15	0.00	2.50	2.44
5	Friday	0.03	0.22	0.49	308.54	614.95	924.23	924.22	847.29	0.00	-8.32	-9.08
6	Saturday	0.04	0.21	0.43	256.82	511.86	769.36	769.37	822.34	0.00	6.89	6.44
7	Sunday	0.05	0.23	0.41	245.95	489.84	736.48	736.49	761.38	0.00	3.38	3.27
8	Monday	5.92	19.22	14.31	292.30	581.46	913.21	913.22	970.10	0.00	6.23	5.86
9	Tuesday	0.02	0.20	0.36	245.71	489.27	735.56	735.55	733.15	0.00	-0.33	-0.33
10	Wednesday	14.88	48.57	48.36	207.22	405.34	724.37	724.38	724.37	0.00	0.00	0.00
11	Thursday	20.95	0.22	69.52	237.88	473.36	801.93	801.93	765.24	0.00	-4.58	-4.79
12	Friday	0.03	0.22	0.55	258.76	515.12	774.68	774.68	773.40	0.00	-0.17	-0.17
13	Saturday	0.03	0.21	0.39	259.65	516.96	777.24	777.24	791.92	0.00	1.89	1.85
14	Sunday	7.11	21.78	0.46	274.32	546.11	849.78	849.77	850.75	0.00	0.11	0.12
15	Monday	0.01	0.19	12.10	483.75	964.62	1460.67	1460.67	1441.40	0.00	-1.32	-1.34
16	Tuesday	0.04	0.19	0.40	610.96	1219.19	1830.78	1830.78	1775.27	0.00	-3.03	-3.13
17	Wednesday	0.03	0.21	0.37	519.12	1036.31	1556.04	1556.02	1554.14	0.00	-0.12	-0.12
18	Thursday	0.02	0.20	0.48	308.58	614.40	923.68	923.68	865.14	0.00	-6.34	-6.77
19	Friday	0.04	0.22	0.40	256.24	510.27	767.17	767.17	813.20	0.00	6.00	5.66
20	Saturday	0.06	0.26	0.45	304.44	606.24	911.45	911.46	814.82	0.00	-10.60	-11.86
21	Sunday	0.06	0.27	0.38	263.09	523.84	787.64	787.64	862.37	0.00	9.49	8.67
22	Monday	10.02	31.70	24.27	259.00	505.39	830.38	830.38	805.18	0.00	-3.03	-3.13
23	Tuesday	0.05	0.26	0.21	196.75	705.40	902.67	902.66	802.19	0.00	-11.13	-12.52
24	Wednesday	0.04	0.24	0.47	274.82	546.78	822.35	822.35	882.74	0.00	7.34	6.84
25	Thursday	0.04	0.23	0.53	299.62	596.45	896.87	896.87	817.82	0.00	-8.81	-9.67
26	Friday	0.08	0.25	0.42	290.69	579.13	870.57	870.58	836.85	0.00	-3.87	-4.03
27	Saturday	0.05	0.24	0.46	281.96	561.02	843.73	843.73	889.37	0.00	5.41	5.13
28	Sunday	0.04	0.23	0.45	325.37	648.18	974.27	974.26	930.23	0.00	-4.52	-4.73
29	Monday	27.35	92.42	24.18	247.01	490.53	881.49	881.48	880.51	0.00	-0.11	-0.11
30	Tuesday	0.02	0.22	0.44	303.32	604.19	908.19	908.21	849.28	0.00	-6.49	-6.94
31	Wednesday	0.02	430.41	0.02	3.01	490.66	924.12	924.12	923.19	0.00	-0.10	-0.10
	TOTALS	746.11	787.09	1023.86	8528.55	18286.58	29372.19	29372.21	28898.74	0.00	-1.61	-1.64

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ACTUAL DAILY FLOWS & COMPLIANCE SHEET - WATER

APPENDIX E-9

Month	Year	WELL 1	WELL 2	WELL 3	WELL 4	WELL 5	WELL FIELD	RAW	TREATED	PERCENTAGE	PERCENTAGE	PERCENTAGE
August	2013	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	RAW WATER WELL FIELD	TREATED WATER WELL FIELD	RAW WATER TREATED WATER
DATE	DAY	m3	m3	m3	m3	m3	m3	m3	m3			
1	Thursday	0.02	617.46	0.00	0.00	304.20	921.68	921.68	862.34	0.00	-6.44	-6.88
2	Friday	0.02	904.53	0.00	0.00	0.00	904.55	904.55	853.87	0.00	-5.60	-5.94
3	Saturday	0.30	927.13	0.00	0.00	0.00	927.43	927.16	880.39	-0.03	-5.07	-5.31
4	Sunday	0.03	864.46	0.00	0.00	0.00	864.49	864.49	866.08	0.00	0.18	0.18
5	Monday	6.37	907.07	0.00	0.00	0.00	913.44	913.44	907.28	0.00	-0.67	-0.68
6	Tuesday	36.31	796.49	0.00	0.00	0.00	832.80	832.80	858.12	0.00	3.04	2.95
7	Wednesday	0.02	965.54	0.00	0.00	0.00	965.56	965.57	929.23	0.00	-3.76	-3.91
8	Thursday	27.14	166.09	53.93	7.59	649.16	903.91	903.92	884.66	0.00	-2.13	-2.18
9	Friday	66.06	0.22	0.36	271.80	676.13	1014.57	1014.58	892.60	0.00	-12.02	-13.67
10	Saturday	0.01	0.22	0.47	311.44	620.44	932.58	932.59	925.51	0.00	-0.76	-0.76
11	Sunday	0.01	0.22	0.44	314.98	626.98	942.63	942.63	936.34	0.00	-0.67	-0.67
12	Monday	6.41	18.16	100.19	245.34	503.20	873.30	873.29	882.11	0.00	1.01	1.00
13	Tuesday	0.04	0.24	0.44	310.02	617.91	928.65	928.65	870.50	0.00	-6.26	-6.68
14	Wednesday	0.02	109.39	111.16	211.52	420.85	852.94	852.93	880.49	0.00	3.23	3.13
15	Thursday	0.03	0.24	0.47	298.07	593.35	892.16	892.17	872.96	0.00	-2.15	-2.20
16	Friday	0.03	0.24	0.49	307.60	611.62	919.98	919.98	861.54	0.00	-6.35	-6.78
17	Saturday	0.03	0.23	0.41	323.83	644.94	969.44	969.46	985.36	0.00	1.64	1.61
18	Sunday	7.66	25.56	17.31	493.83	982.94	1527.30	1527.29	1402.63	0.00	-8.16	-8.89
19	Monday	0.02	145.88	0.25	212.72	583.15	942.02	942.00	916.94	0.00	-2.66	-2.73
20	Tuesday	0.02	44.72	0.00	0.00	446.74	491.48	891.48	932.40	44.87	89.71	4.39
21	Wednesday	0.05	441.43	0.00	0.00	443.20	884.68	884.67	886.03	0.00	0.15	0.15
22	Thursday	0.02	430.18	0.00	0.00	432.31	862.51	862.51	781.66	0.00	-9.37	-10.34
23	Friday	0.01	355.11	0.00	0.00	357.39	712.51	712.51	763.49	0.00	7.15	6.68
24	Saturday	0.01	432.63	0.00	0.00	434.85	867.49	867.49	795.88	0.00	-8.25	-9.00
25	Sunday	209.06	14.84	12.36	0.68	638.00	874.94	874.95	853.88	0.00	-2.41	-2.47
26	Monday	128.16	0.19	0.03	0.13	707.12	835.63	835.62	789.02	0.00	-5.58	-5.91
27	Tuesday	0.01	0.19	0.00	0.00	758.32	758.52	758.32	814.35	-0.03	7.36	6.88
28	Wednesday	0.02	0.20	0.00	0.00	786.08	786.30	786.29	723.40	0.00	-8.00	-8.69
29	Thursday	0.05	0.20	0.00	0.00	741.38	741.63	741.60	725.82	0.00	-2.13	-2.17
30	Friday	0.05	0.22	0.00	0.00	634.11	634.38	634.38	643.05	0.00	1.37	1.35
31	Saturday	0.04	0.22	0.05	0.00	644.23	644.54	644.54	641.70	0.00	-0.44	-0.44
	TOTALS	488.03	8169.50	298.36	3309.55	14858.60	27124.04	27523.54	26819.63	1.45	-1.12	-2.62

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ACTUAL DAILY FLOWS & COMPLIANCE SHEET - WATER

APPENDIX E-10

Month	Year	WELL 1	WELL 2	WELL 3	WELL 4	WELL 5	WELL FIELD	RAW	TREATED	PERCENTAGE	PERCENTAGE	PERCENTAGE
September	2013	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	RAW WATER	TREATED WATER	RAW WATER
DATE	DAY	m3	m3	m3	m3	m3	m3	m3	m3	WELL FIELD	WELL FIELD	TREATED WATER
1	Sunday	0.04	0.23	0.08	0.00	650.95	651.30	639.67	660.35	-1.82	1.39	3.13
2	Monday	0.02	56.99	118.99	0.06	560.31	736.37	753.98	720.98	2.34	-2.09	-4.58
3	Tuesday	6.52	542.07	0.16	223.31	18.85	790.91	794.94	663.66	0.51	-16.09	-19.78
4	Wednesday	0.69	282.57	58.89	16.47	368.63	727.25	784.20	678.65	7.26	-6.68	-15.55
5	Thursday	0.03	0.20	0.30	242.49	481.66	724.68	741.92	689.35	2.32	-4.88	-7.63
6	Friday	0.01	0.20	0.42	198.71	395.14	594.48	610.94	675.81	2.69	13.68	9.60
7	Saturday	3.46	0.22	9.92	246.10	490.31	750.01	763.57	719.19	1.78	-4.11	-6.17
8	Sunday	16.29	0.22	54.79	250.26	498.20	819.76	838.60	769.95	2.25	-6.08	-8.92
9	Monday	7.41	24.45	19.36	203.55	405.18	659.95	675.80	687.13	2.35	4.12	1.65
10	Tuesday	0.02	0.21	0.28	236.7	483.8	721.01	743.31	692.71	3.00	-3.93	-7.30
11	Wednesday	193.44	0.21	0.01	0.00	570.48	764.14	774.00	723.76	1.27	-5.28	-6.94
12	Thursday	218.48	0.20	0.00	0.00	646.10	864.78	873.79	824.71	1.03	-4.63	-5.95
13	Friday	221.51	0.18	0.00	0.00	654.37	876.06	884.70	837.66	0.98	-4.38	-5.62
14	Saturday	200.98	7.72	6.30	0.00	592.56	807.56	815.49	751.93	0.97	-6.89	-8.45
15	Sunday	204.94	63.93	0.00	0.00	572.15	841.02	844.21	786.27	0.38	-6.51	-7.37
16	Monday	165.83	26.03	20.48	12.19	505.91	730.44	731.82	782.66	0.19	7.15	6.50
17	Tuesday	22.73	558.09	0.00	0.00	165.49	746.31	723.42	712.34	-3.16	-4.55	-1.56
18	Wednesday	0.01	22.99	382.27	0.36	286.25	691.88	738.29	693.88	6.29	0.29	-6.40
19	Thursday	0.01	0.19	606.17	0.06	198.35	804.78	795.32	727.75	-1.19	-9.57	-9.28
20	Friday	0.13	365.62	198.68	192.85	0.15	757.43	764.19	700.08	0.88	-7.57	-9.16
21	Saturday	0.03	769.40	0.00	7.53	0.01	776.97	752.58	760.33	-3.24	-2.14	1.02
22	Sunday	0.05	732.23	18.79	13.18	0.02	764.27	738.70	787.55	-3.46	3.05	6.20
23	Monday	0.06	676.81	0.00	0.00	0.94	677.81	655.04	688.43	-3.48	1.57	4.85
24	Tuesday	0.04	686.88	0.00	0.00	0.00	686.92	664.17	654.69	-3.43	-4.69	-1.45
25	Wednesday	0.05	597.98	0.00	0.00	0.00	598.03	580.67	544.15	-2.99	-9.01	-6.71
26	Thursday	0.08	625.73	0.00	0.00	0.00	625.81	606.60	547.55	-3.17	-12.51	-10.78
27	Friday	0.05	462.27	0.00	0.00	0.00	462.32	448.98	549.05	-2.97	18.76	18.23
28	Saturday	0.03	654.48	0.00	0.00	0.00	654.51	637.95	616.07	-2.60	-5.87	-3.55
29	Sunday	6.01	663.03	0.00	0.00	0.00	669.04	646.40	651.85	-3.50	-2.57	0.84
30	Monday	76.23	176.53	31.85	21.29	299.33	605.23	589.08	565.18	-2.74	-6.62	-4.23
	TOTALS	1345.18	7997.86	1527.74	1865.11	8845.14	21581.03	21612.33	20863.67	0.14	-3.32	-3.59

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APPENDIX E-11

Month October	Year 2013	WELL 1 FLOW	WELL 2 FLOW	WELL 3 FLOW	WELL 4 FLOW	WELL 5 FLOW	WELL FIELD FLOW	RAW FLOW	TREATED FLOW	PERCENTAGE RAW WATER WELL FIELD	PERCENTAGE TREATED WATER WELL FIELD	PERCENTAGE RAW WATER TREATED WATER
DATE	DAY	m3	m3	m3	m3	m3	m3	m3	m3			
1	Tuesday	143.400	0.22	0.000	0.010	420.330	563.96	569.070	544.610	0.91	-3.43	-4.49
2	Wednesday	142.010	0.2	0.000	0.000	418.220	560.43	567.870	542.600	1.33	-3.18	-4.66
3	Thursday	141.380	0.2	0.000	0.000	413.290	554.87	555.890	540.260	0.18	-2.63	-2.89
4	Friday	142.640	0.17	0.000	0.000	417.890	560.70	567.030	492.960	1.13	-12.08	-15.03
5	Saturday	144.120	0.17	0.000	0.000	423.680	567.97	574.520	545.740	1.15	-3.91	-5.27
6	Sunday	154.410	0.18	0.000	0.000	453.740	608.33	615.930	591.700	1.25	-2.73	-4.09
7	Monday	112.640	18.83	13.230	9.290	338.340	492.33	495.920	512.820	0.73	4.16	3.30
8	Tuesday	143.280	0.17	0.000	0.000	421.180	564.63	567.020	535.850	0.42	-5.10	-5.82
9	Wednesday	89.430	110.78	82.540	54.410	220.500	557.66	556.320	593.110	-0.24	6.36	6.20
10	Thursday	18.670	572.89	0.010	0.010	18.890	610.47	598.520	564.970	-1.96	-7.45	-5.94
11	Friday	0.050	425.59	0.000	0.020	220.400	646.06	637.390	580.450	-1.34	-10.16	-9.81
12	Saturday	0.030	656.71	0.000	0.000	0.000	656.74	637.000	638.320	-3.01	-2.80	0.21
13	Sunday	0.020	535.3	0.000	0.000	0.000	535.32	517.470	596.150	-3.33	11.36	13.20
14	Monday	0.040	590.42	0.000	0.020	47.050	637.53	621.080	634.730	-2.58	-0.44	2.15
15	Tuesday	8.430	569.49	40.160	24.150	45.190	687.42	675.100	590.140	-1.79	-14.15	-14.40
16	Wednesday	0.050	565.73	0.000	0.000	0.000	565.78	547.280	580.300	-3.27	2.57	5.69
17	Thursday	0.050	539.05	0.010	0.000	0.000	539.11	522.610	568.650	-3.06	5.48	8.10
18	Friday	0.050	610.65	0.000	0.000	0.000	610.70	591.050	537.970	-3.22	-11.91	-9.87
19	Saturday	0.060	651.34	0.000	0.000	0.000	651.40	631.190	602.170	-3.10	-7.56	-4.82
20	Sunday	11.700	655.4	0.000	0.000	0.000	667.10	646.760	631.110	-3.05	-5.39	-2.48
21	Monday	3.800	453.08	33.820	21.370	27.250	539.32	524.130	566.130	-2.82	4.97	7.42
22	Tuesday	0.040	615.03	0.000	0.000	0.000	615.07	595.830	585.900	-3.13	-4.74	-1.69
23	Wednesday	0.030	636.42	0.000	0.000	0.000	636.45	615.740	587.740	-3.25	-7.65	-4.76
24	Thursday	0.030	453.65	0.110	0.410	62.170	516.37	496.790	580.030	-3.79	12.33	14.35
25	Friday	19.830	615.58	34.080	0.480	0.000	669.97	649.940	565.400	-2.99	-15.61	-14.95
26	Saturday	10.920	651.52	0.010	0.010	2.130	664.59	643.670	650.340	-3.15	-2.14	1.03
27	Sunday	0.030	650.62	0.000	0.000	0.000	650.65	630.150	673.750	-3.15	3.55	6.47
28	Monday	13.540	531.26	23.670	15.260	12.570	596.30	578.720	619.220	-2.95	3.84	6.54
29	Tuesday	0.020	508.06	83.790	0.090	92.450	684.41	680.620	593.270	-0.55	-13.32	-14.72
30	Wednesday	0.040	0.17	0.250	212.230	421.080	633.77	646.830	640.800	2.06	1.11	-0.94
31	Thursday	0.040	0.17	0.310	223.060	444.400	667.98	684.560	668.770	2.48	0.12	-2.36
	TOTALS	1300.78	11619.05	311.99	560.82	4920.75	18713.39	18442.00	18155.96	-1.45	-2.98	-1.58

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ACTUAL DAILY FLOWS & COMPLIANCE SHEET - WATER

APPENDIX E-12

Month November	Year 2013	WELL 1 FLOW	WELL 2 FLOW	WELL 3 FLOW	WELL 4 FLOW	WELL 5 FLOW	WELL FIELD FLOW	RAW FLOW	TREATED FLOW	PERCENTAGE RAW WATER WELL FIELD	PERCENTAGE TREATED WATER WELL FIELD	PERCENTAGE RAW WATER TREATED WATER
DATE	DAY	m3	m3	m3	m3	m3	m3	m3	m3			
1	Friday	0.02	0.17	0.40	243.30	483.80	727.69	746.24	666.84	2.49	-8.36	-11.91
2	Saturday	0.02	0.17	0.32	245.34	488.68	734.53	747.28	715.52	1.71	-2.59	-4.44
3	Sunday	7.80	18.54	2.41	255.67	509.37	793.79	784.74	735.67	-1.15	-7.32	-6.67
4	Monday	0.05	0.17	61.54	198.98	391.27	652.01	674.96	650.74	3.40	-0.19	-3.72
5	Tuesday	0.08	0.17	0.31	220.79	440.00	661.35	678.59	673.34	2.54	1.81	-0.78
6	Wednesday	0.07	0.17	0.30	228.82	455.63	684.99	703.59	606.29	2.64	-11.49	-16.05
7	Thursday	0.06	0.17	0.36	202.42	402.73	605.74	624.95	629.02	3.07	3.84	0.65
8	Friday	0.05	0.17	0.26	216.20	430.20	646.88	662.61	626.59	2.37	-3.14	-5.75
9	Saturday	0.06	0.17	0.33	223.08	443.25	666.89	685.97	703.40	2.78	5.47	2.48
10	Sunday	0.07	0.17	0.34	261.02	518.96	780.56	802.48	748.65	2.73	-4.09	-7.19
11	Monday	8.20	18.83	43.43	229.22	452.81	752.49	774.56	719.34	2.85	-4.41	-7.68
12	Tuesday	0.03	0.17	0.31	226.95	451.08	678.54	698.08	646.98	2.80	-4.65	-7.90
13	Wednesday	0.03	0.17	0.32	236.52	470.86	707.90	729.77	655.68	3.00	-7.38	-11.30
14	Thursday	13.31	37.13	30.31	187.42	372.86	641.03	651.03	600.82	1.54	-6.27	-8.36
15	Friday	0.02	264.08	0.00	0.01	265.31	529.42	551.13	567.06	3.94	7.11	2.81
16	Saturday	157.47	0.17	0.00	0.00	461.95	619.59	624.62	643.35	0.81	3.83	2.91
17	Sunday	184.45	0.17	0.00	0.00	543.03	727.65	734.03	663.03	0.87	-8.88	-10.71
18	Monday	84.24	22.05	18.46	11.13	383.65	519.53	519.53	586.44	0.00	12.88	11.41
19	Tuesday	156.09	0.16	0.00	0.00	515.82	672.07	622.76	586.11	-7.92	-12.79	-6.25
20	Wednesday	144.80	0.17	0.00	0.00	424.98	569.95	575.72	589.33	1.00	3.40	2.31
21	Thursday	143.17	0.17	0.00	0.00	419.24	562.58	563.05	578.96	0.08	2.91	2.75
22	Friday	156.57	92.13	0.00	0.00	398.18	646.88	645.85	575.84	-0.16	-10.98	-12.16
23	Saturday	149.76	0.17	0.00	0.00	441.35	591.28	593.02	644.74	0.29	9.04	8.02
24	Sunday	189.22	0.17	0.00	0.00	554.73	744.12	743.55	684.86	-0.08	-7.96	-8.57
25	Monday	160.87	23.95	19.74	11.97	464.87	681.40	669.24	639.40	-1.82	-6.16	-4.67
26	Tuesday	149.73	0.17	0.01	0.02	440.05	589.98	580.02	611.20	-1.72	3.60	5.10
27	Wednesday	171.12	0.17	0.00	0.00	499.74	671.03	656.59	632.40	-2.20	-5.76	-3.83
28	Thursday	170.62	0.17	0.00	0.00	502.25	673.04	664.72	624.85	-1.25	-7.16	-6.38
29	Friday	148.92	0.17	0.00	0.00	437.02	586.11	577.14	590.30	-1.55	0.71	2.23
30	Saturday	193.32	0.17	0.00	0.02	569.64	763.15	753.46	659.05	-1.29	-13.64	-14.33
	TOTALS	2390.22	480.61	179.15	3198.88	13633.31	19882.17	20039.28	19255.80	0.78	-3.15	-4.07

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APPENDIX E-13

Month	Year	WELL 1	WELL 2	WELL 3	WELL 4	WELL 5	WELL FIELD	RAW	TREATED	PERCENTAGE	PERCENTAGE	PERCENTAGE
December	2013	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	RAW WATER	TREATED WATER	RAW WATER
DATE	DAY	m3	m3	m3	m3	m3	m3	m3	m3	WELL FIELD	WELL FIELD	TREATED WATER
1	Sunday	160.51	0.17	0.00	0.00	470.96	631.64	620.50	712.47	-1.80	12.80	12.91
2	Monday	165.18	22.35	22.02	13.66	517.33	740.54	725.31	634.19	-2.10	-14.36	-14.37
3	Tuesday	181.75	0.17	333.39	0.18	116.61	632.10	600.45	637.58	-5.27	0.87	5.82
4	Wednesday	157.67	0.17	387.44	0.05	118.45	663.78	646.22	649.73	-2.72	-2.12	0.54
5	Thursday	236.40	0.17	582.10	0.09	0.00	818.76	771.77	671.95	-6.09	-17.93	-14.86
6	Friday	181.19	0.17	447.87	0.05	0.00	629.28	594.76	670.71	-5.80	6.58	11.32
7	Saturday	235.66	0.17	58.41	0.35	0.03	294.62	767.98	695.77	61.64	136.16	-10.38
8	Sunday	189.55	0.17	467.38	0.18	0.03	657.31	619.38	713.93	-6.12	8.61	13.24
9	Monday	176.21	14.38	480.47	30.02	51.09	752.17	715.52	664.00	-5.12	-11.72	-7.76
10	Tuesday	168.03	54.24	413.79	53.73	60.90	750.69	727.69	664.46	-3.16	-11.49	-9.52
11	Wednesday	165.51	37.31	407.57	26.51	42.91	679.81	653.77	665.49	-3.98	-2.11	1.76
12	Thursday	152.80	72.49	374.69	0.05	81.21	681.24	660.60	667.37	-3.12	-2.04	1.01
13	Friday	196.94	0.17	483.81	0.09	42.48	723.49	680.40	651.85	-6.33	-9.90	-4.38
14	Saturday	202.28	0.17	499.16	0.04	39.70	741.35	711.23	714.83	-4.23	-3.58	0.50
15	Sunday	197.52	44.89	484.60	34.76	2.13	763.90	726.19	746.01	-5.19	-2.34	2.66
16	Monday	195.42	22.92	505.10	30.19	9.25	762.88	724.20	702.40	-5.34	-7.93	-3.10
17	Tuesday	243.02	0.17	599.01	0.02	0.08	842.30	789.84	807.86	-6.64	-4.09	2.23
18	Wednesday	417.92	0.17	1031.95	0.00	0.19	1450.23	1364.23	1324.67	-6.30	-8.66	-2.99
19	Thursday	235.33	0.17	579.98	0.01	0.09	815.58	766.88	745.27	-6.35	-8.62	-2.90
20	Friday	211.71	0.17	521.12	0.00	0.07	733.07	690.10	679.22	-6.23	-7.35	-1.60
21	Saturday	219.96	0.17	542.28	0.02	0.10	762.53	717.98	741.73	-6.20	-2.73	3.20
22	Sunday	239.82	0.17	590.67	0.02	1.95	832.63	782.42	756.26	-6.42	-9.17	-3.46
23	Monday	197.13	84.43	477.48	11.88	22.14	793.06	753.98	701.73	-5.18	-11.52	-7.45
24	Tuesday	140.91	40.76	347.67	85.67	92.17	707.18	688.61	735.06	-2.70	3.94	6.32
25	Wednesday	232.07	0.17	568.78	0.02	0.07	801.11	747.53	684.26	-7.17	-14.59	-9.25
26	Thursday	230.05	91.59	385.70	0.00	0.07	707.41	665.75	723.39	-6.26	2.26	7.97
27	Friday	0.03	444.26	121.90	205.05	3.43	774.67	774.95	718.38	0.04	-7.27	-7.87
28	Saturday	0.04	672.20	0.00	89.28	0.00	761.52	748.32	750.20	-1.76	-1.49	0.25
29	Sunday	0.04	876.41	0.00	0.00	0.00	876.45	840.29	775.56	-4.30	-11.51	-8.35
30	Monday	16.48	533.02	30.28	14.94	115.48	710.20	684.53	738.90	-3.75	4.04	7.36
31	Tuesday	234.82	43.75	579.18	0.08	0.05	857.88	804.74	773.22	-6.60	-9.87	-4.08
	TOTALS	5581.95	3057.72	12323.80	596.94	1788.97	23349.38	22766.12	22518.45	-2.56	-3.56	-1.10

GLOSSARY OF TERMS

APPENDIX F

Here are some terms that the reader should know about before reading the content of this report, and the laboratory results attached.

PARAMETER – A measurable or quantifiable characteristic or feature. These elements can be organic (Bacteria), or inorganic (metals or salts), and/or a variety of pesticides, herbicides and PCB's.

COLOUR - The aesthetic objective for colour in drinking water is 5 TCU (True Colour Units). Water can have a faint yellow/brown colour which is often caused by organic materials created by the decay of vegetation. Sometimes colour may be contributed to by Iron and Manganese compounds produced by processes occurring in natural sediments or in aquifers. The presence of organic material is the main cause of disinfection by-products when water is treated with chlorine.

I.M.A.C (Maximum Acceptable Concentration) – This is a health-related Ontario Drinking water standards established for contaminants when there are insufficient toxicological data to establish a M.A.C. with reasonable certainty, or when it is not practical to establish a M.A.C. at the desired level.

mg/L (Milligrams per Litre) – This is a unit of measure of the concentration of a parameter in water, sometimes called ppm (parts per million). Simply put, mg/L means one kilogram of a chemical, or contaminant, in one million kilograms (litres) of water.

ug/L (Micrograms per Litre) – This is a unit of measure of the concentration of a parameter in water, sometimes called ppb (parts per billion). Simply put, ug/L means one kilogram of a chemical, or contaminant, in one billion kilograms (litres) of water. 1000ug/L = 1 mg/L

ng/L (Nanograms per Litre) – This is a unit of measure of the concentration of a parameter in water, sometimes called ppt (parts per Trillion). Simply put, ng/L means one kilogram of a chemical, or contaminant, in one Trillion kilograms (litres) of water. 1000 ng/L = 1ug/L

pg/L (Picograms per Litre) – This is a unit of measure of the concentration of a parameter in water, sometimes called ppq (parts per quadrillion). Simply put, mg/L means one kilogram of a chemical, or contaminant, in one thousand trillion kilograms (litres) of water. 1000pg/L = 1 ng/L

pH – pH is a parameter that indicates the acidity of a water sample. The operational guideline recommended in drinking water is to maintain a pH between 6.5 and 8.5. The principal objective in controlling pH is to produce a water that is neither corrosive nor produces incrustation. At pH levels above 8.5, mineral incrustations and bitter tastes can occur. Corrosion is commonly associated with pH levels below 6.5 and elevated levels of certain undesirable chemical parameters. With pH levels above 8.5, there is a progressive decrease in the efficiency of chlorine disinfection and alum coagulation.

Temperature – An aesthetic objective is set for maximum water temperature to aid in selection of the best water source or the best placement for a water intake. It is desirable that the temperature of drinking water should not exceed 15 °C because of the palatability of water is enhanced by it coolness. Low water temperatures offer a number of other benefits. A temperature below 15 °C will tend to reduce the growth of nuisance organisms and minimize associated taste, colour, odour and corrosion problems. In the summer and fall, water temperatures may increase in the distributed water due to the warming of the soil. Low temperature facilitates maintenance of a free chlorine residual by reducing the rates of decay of the chlorine.

THMs (TRIHALOMETHANES) – The M.A.C. for THMs in drinking water is 0.10 mg/L based on a four quarter moving annual average of test results. THMs are the most widely occurring synthetic organics found in chlorinated drinking water. The four most commonly detected THMs in drinking water are chloroform, bromodichloromethane, chlorodibromomethane and bromoform. The principal source of the THMs in drinking water is the chemical reaction of chlorine with naturally occuring organics left in the water after filtration.

TURBIDITY - The M.A.C. for turbidity in drinking water is 1.0 FTU (FormazinTurbidity Unit) or 1.0 NTU (Nephlometric Turbidity Units) for water entering the distribution system but much lower turbidity around less than 0.1 are commonly continuously attained in well operated treatment plants. Turbidity measurements are made frequently to confirm the existence of good operating conditions at all surface water treatment plants and at some ground water plants.

An appearance related aesthetic objective of 5 FTU or NTU has been set for water consumers' Taps. Turbidity higher than 5 FTU or NTU taken at consumers' taps generally indicates severe local corrosion and/or poor bacteriological control due to loss of chlorine residual.

Turbidity in water is caused by the presence of suspended tiny particles that scatter light and make the water appear cloudy. These particles are made from matter such as clay, silt, spores, plankton and other microorganisms. The most important health related effect of turbidity is interference with disinfection and with the maintenance of chlorine residual. Viable coli form bacteria have been detected in waters with the turbidity higher than 3.8 NTU or FTU even in the presence of free chlorine residuals of up to 0.5 mg/L and after a contact time in excess of 30 minutes. Outbreaks of disease traced to chlorinated water supplies have been associated with high turbidity