



The Corporation of the Municipality of Port Hope

Port Hope

Drinking Water Treatment Plant

2008

Summary Report



The Corporation of the Municipality of Port Hope
Department of Public Works,
Drinking Water Treatment Division
35 Marsh St.
Port Hope, ON
L1A 4K3

March 15, 2008

Municipality of Port Hope
P.O. Box 117
56 Queen Street
Port Hope, ON
L1A 3V9

Attention: Mr. Peter Angelo, P. Eng., Director of Municipal Engineering Services

Dear Peter:

RE: 2008 Summary Report – Port Hope Water Treatment Plant

We are pleased to provide the *2008 Summary Report* for the Port Hope Water Treatment Plant as outlined in Schedule 22 of Ontario Regulation 170/03.

Sincerely,

Rick Trumper
Water Treatment Supervisor
Municipality of Port Hope
Water Department

Letter of Transmittal

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1. INTRODUCTION

1.1 BACKGROUND

The Municipality of Port Hope is located within Northumberland County, approximately 90 km east of Toronto. The Community of Port Hope has a population of 12,500 with combined residential, commercial, industrial and institutional use.

Given the First Engineers' Report in February 2001, extensive upgrades were required for the old WTP, resulting in the construction of a new membrane filtration plant, which was commissioned on August 23, 2005.

On June 1, 2003, the Province introduced Regulation 170/03 under the Ontario Safe Drinking Water Act. This new regulation requires all municipal water systems to complete an Annual Report (submitted to the Ministry of the Environment) and a Summary Report (submitted to Council) for their water treatment plants.

This report is an independent 2008 Summary Report for the drinking water treatment plant.

1.2 TERMS AND CONDITIONS OF THE CERTIFICATE OF APPROVAL

Table 1-1 lists the headings of the Terms and Conditions of the latest CofA.

Table 1-1 Terms and Conditions of the CofA

Part No.	Heading
1	Drinking Water System Description
2	Definitions and Information
3	General
4	Performance
5	Monitoring and Recording
6	Operations and Maintenance
7	Future Alterations
8	Studies and Upgrades Required
9	Relief from Regulatory Requirements



2. CERTIFICATIONS

This section covers all certifications related to Port Hope WTP and distribution system, including:

- ◆ Certificates of approval;
- ◆ Permits to take water;
- ◆ Facility/distribution system classification; and,
- ◆ Operator classification.

2.1 CERTIFICATES OF APPROVAL

Table 2-1 summarizes the Certificates of Approval (CofA), which can be found in **Appendix A**.

Table 2-1 Certificates of Approval

Certificate Type	Certificate Number	Date Issued	Brief Description of Works Approved
Water Treatment Plant	3586-5T6QJL (Air)	Nov. 17/03	Installation and operation of a diesel generator
Water Treatment Plant	4024-7FZREZ	July 14, 2008	20,000 Cubic Metres per Day Ultrafiltration Water Treatment Plant.

2.2 PERMIT TO TAKE WATER

The Permit to Take Water (PTTW) for the Port Hope WTP is summarised in Table 2-2 and attached in **Appendix B**.

Table 2-2 Permit To Take Water (PTTW)

Permit Number	Source	Issued Date	Expiration Date	Permitted Amount of Taking
02-P-4040	Lake Ontario	July 12, 2002	April 15, 2008	20,002,400 litres
2205-7DQHGN	Lake Ontario	April 15, 2008	April 30, 2018	52,700,000 litres

2.3 FACILITY CLASSIFICATION

Details of Port Hope facility certifications are presented in Table 2-3.

Table 2-3 Facility Classifications

Facility Type	Facility Name	Class	Certificate No.	Date of Issue
Plant	Port Hope Water Treatment Plant	II	WT #3552	July 26, 2005
Distribution	Port Hope Water Distribution System	III	WD #4713	January 24, 2007



2.4 OPERATOR CERTIFICATION

The Corporation of the Municipality of Port Hope currently operates the Port Hope Water Supply System (WSS). Staff members responsible for the water supply and distribution systems are licensed operators with their certifications presented in Table 2-4.

Table 2-4 Operator Certifications

Name	Position	Certificate Level			Certification Number			Expiry Date		
		T	D	WQA	T	D	WQA	T	D	WQA
Rick Trumper	Supervisor Water Treatment	III	III	I	421	422	11995	06/30/11	03/31/11	05/31/10
Mike Stewart	Treatment Operator	III	II	I	13137	15294	11998	03/31/11	03/31/10	05/31/10
Geoff Morgan	Treatment Operator	II	II	-	9907	14148	-	06/30/09	06/30/09	-
Jerry Lord	Treatment Operator	II	II	-	11529	15321	-	11/30/09	04/30/10	-
Ed Symons	Superintendent Water Distribution	II	III	-	5081	5082	-	08/31/09	03/31/09	-
Rick Held	Distribution Operator	II	II	-	4871	4872	-	04/30/09	02/28/10	-
Larry Green	Distribution Operator	II	II	-	9290	9291	-	02/28/12	02/28/12	-
BJ Coull	Distribution Operator	-	I	-	-	50656	-	-	03/31/10	-
T = Treatment License D = Distribution License WQA = Water Quality Analyst License										



3. WATER FLOWS

3.1 OVERVIEW

This section gives a summary of records made relating to flow rate exceedances.

This section also gives a summary and discussion of the quantity of treated water supplied in 2008 compared to the rated capacity specified in the CofA, including monthly average and maximum daily flows.

Section 4.1 of the CofA states the following:

“The drinking water system shall not be operated to exceed the rated capacity for the maximum flow into the distribution system of 20,300 m³/d in any given calendar day”.

Currently, there is sufficient membrane modules installed to produce Phase 1 flows of 14,000 m³/d. Note that this flow rate is a total net daily production of treated water.

Given the downtime for cleaning and pressure decay tests; and, on-site water usage for cleaning (backwashing, chemical enhanced backwashing and clean-in-place the membranes), the instantaneous flow rate into the membranes is higher than the plant rated capacity as defined above. Given the current recovery rate of 90%, the membrane instantaneous factor has been defined as 1.26, thus requiring an instantaneous flow rate into the membranes of 17,640 m³/d.

Note however, that the plant was designed for an ultimate rated capacity of 31,700 m³/d and a recovery rate of 85%, which requires an instantaneous factor of 1.42 and thus instantaneous flow rate of 45,000 m³/d.

Given the current recovery rate of 90%, the daily net raw water volume currently required is 13,333 m³/d. Given the ultimate recovery rate of 85%, the daily net raw water volume ultimately required 37,294 m³/d.

A summary of the above is provided below:

- Current plant rated capacity (net treated water production)= 14,000 m³/d
- Current instantaneous flow rate from membranes = 175 L/s (15,120 m³/d)
- Current daily net raw water volume = 36,597 L/m (relevant to PTTW)
- Ultimate plant rated capacity (net treated water production)= 31,700 m³/d
- Ultimate instantaneous flow rate from membranes = 521 L/s (45,000 m³/d)
- Ultimate daily net raw water volume = 52,700,000 L (relevant to PTTW)

This section also accounts for the wastewater production from the water treatment process.

Table 3-1 shows that the highest net daily raw water volume of 11,122 m³/d has not exceeded the flow allowed in the PTTW of 52,700,000 L/d.



Table 3-1 Net Daily Raw Water Volumes

Item	Avg. Day (m ³ /d)	Max. Day (m ³ /d)
January	6,788	9,063
February	6,850	8,199
March	6,473	7,590
April	7,121	8,286
May	7,315	8,847
June	7,651	8,962
July	8,648	10,204
August	8,579	11,122
September	8,493	10,539
October	7,985	9,267
November	7,278	8,857
December	7,028	9,016
Avg.	7,517	9,163
Max.	8,648	11,122
Notes:		

3.2 RAW WATER FLOWS

A summary of the daily quantities of water being taken from Lake Ontario (i.e., net daily raw water volumes) are shown in Table 3-1.

3.3 MEMBRANE INSTANTANEOUS FLOWRATE

A summary of the combined instantaneous flow rate from the membranes is shown in Table 3-2.

Table 3-2 shows that the maximum combined instantaneous flow rate from the membranes of (14,000 m³/d) has not exceeded the anticipated maximum flow rate of 175 L/s (15,120 m³/d) per Section 3.1.



Table 3-2 Combined Instantaneous Flow rate from Membranes

Item	Average	Maximum	
	m ³ /d	L/s	m ³ /d
January	5,107	378	6,397
February	5,228	265	6,155
March	5,276	270	6,230
April	5,817	202	6,965
May	6,094	260	7,557
June	6,562	539	7,646
July	7,176	250	8,749
August	7,094	258	8,738
September	7,005	283	8,643
October	6,570	266	7,978
November	5,825	262	7,293
December	5,208	248	6,952
Avg.	6,672.6	290.1	7,442
Max.	8,664	539	8,749
Notes:			

3.4 TREATED WATER FLOWS

The treated water flows are shown in Table 3-3.

Table 3-3 shows that the plant rated capacity of 20,000 m³/d was not exceeded. The maximum daily water demand has reached 46.4% of the plant rated capacity.

The maximum day factor (ratio of maximum day demand to average day demand) was approximately 1.31, while the peak hour factor (ratio of maximum peak hour demand to average day demand) was approximately 32.41.

Table 3-3 Treated Water Flows

Item	Avg. Day (m ³ /d)	Max. Day (m ³ /d)	% Max/ Rated Capacity	Max. Peak Hour (m ³ /h)
January	5,064	6,314	31.6	190.1
February	5,206	6,219	31.1	192.0
March	5,221	6,219	31.1	195.6
April	5,715	6,690	33.5	218.1
May	6,045	7,094	35.5	195.8
June	6,502	7,493	37.5	208.2
July	7,061	8,330	41.7	197.3



Item	Avg. Day (m ³ /d)	Max. Day (m ³ /d)	% Max/ Rated Capacity	Max. Peak Hour (m ³ /h)
August	7,069	9,269	46.3	199.8
September	6,969	8,944	44.7	175.1
October	6,498	7,635	38.2	201.2
November	5,702	8,322	41.6	184.9
December	5,137	6,474	32.4	161.3
Avg.	6,015.8	7,416.9	37.1	193.3
Max.	7,069	9,269	46.3	218.1
Notes:				

3.5 WASTEWATER FLOWS

Wastewater is generated on-site from cleaning the membranes by the following processes: backwashing, chemical enhanced backwashing and clean-in-place cycles. It has been anticipated that 10% of the raw water volume is used for these processes, resulting in the plant recovery rate of 90%.

Table 3-4 shows that wastewater production in any given month has averaged 28.2% of the raw water flows, which is 18.2% more than the anticipated 10% wastewater production.

Table 3-4 Wastewater Flows

Item	Total Monthly Raw Water Volume (m ³)	Total Monthly Wastewater Volume (m ³)	% Wastewater/ Raw
January	211,027	73,522	34.84
February	202,438	72,069	35.60
March	172,548	53,916	31.25
April	213,618	61,022	28.57
May	226,010	54,634	24.17
June	229,539	52,089	22.69
July	268,476	66,270	24.68
August	262,531	74,919	28.54
September	265,527	62,678	23.61
October	247,319	57,308	23.17
November	224,900	60,086	26.72
December	218,707	74,870	34.23
Avg.	228,553.3	57,494.5	28.2
Max.	268,476	74,919	35.6
Notes:			



4. CHEMICALS

This section gives a summary of listing treatment chemicals used, including average dosage rates with special reference to any abnormal usage.

4.1 PROPERTIES

Table 4-1 shows the properties of the chemicals used at Port Hope WTP.

Table 4-1 Properties of Chemical Feed Systems

Chemical	Purpose	Concentration (%)	Specific Gravity (g/mL)	Target Dosage (mg/L)
Chlorine gas	◆ Zebra mussel control	100	-	◆ 1.2
	◆ Primary disinfection			◆ 1.0
	◆ Touch-up chlorination			◆ 0.3
Sodium Bisulphite	◆ Dechlorinate the supernatant from the wastewater treatment process before it flows to the Lake	38	1.29	◆ 0.73

4.2 USAGE

Table 4-2 summarizes the annual chemical usage and monthly average dosages.

Table 4-2 Annual Chemical Usage at Port Hope WTP

Chemical	Volume (L) or Weight (kg)	Range of Monthly Avg. Dosages (mg/L)	Month with Highest Avg. Dosage	Comments of Any Abnormal Usage
Primary Disinfection Chlorine gas	kg	1.02 – 2.04	August	-
Secondary Disinfection Chlorine Gas	kg	.27 - .59	January	-
Sodium Bisulphite	L	3.92 – 8.33	June	-



5. SAMPLING ANALYTICAL RESULTS

5.1 OVERVIEW

This section consists of a summary of analytical results of sampling required by Ontario Drinking Water Quality Standards (ODWQS) and Conditions 5.5 of the CofA in Appendix A.

Appendix B contains the sampling results, which are summarized in tables, they are identical to Schedules 23 and 24 in *Regulation 170/03, Drinking Water Systems Regulation*.

5.2 MICROBIOLOGICAL

The bacteriological data in the raw, treated and distribution water supply are shown in Tables D-5 to D-7.

Ontario Reg. 170/03, Schedule 10 states, that samples of raw water do not need to be analysed for heterotrophic plate count (HPC) or background colonies (BKG).

If either the treated or distribution water contain *any* total coliform (TC) or fecal coliform (FC), then the sample is considered adverse. The corrective action in all cases is to report, resample, analyze and follow the instructions as directed by the Medical Officer of Health.

There was one (1) adverse sample for 2008.

Table 5-1 Adverse Microbiological Samples

Date	Location	Exceedances	Comments
July 24, 2008	Keith Place	Total Coliform (6 colonies)	Subsequent sampling, at this and other up and down stream locations were returned with negative results. Changes to sampling and sample station procedures have been implemented.

5.3

5.4 TURBIDITY

Figure 5-1 plots raw water turbidity with raw water temperatures and flows between January 1 and December 31, 2008. As shown, turbidity is greatest during the spring run-off and fall turnover when temperatures and flows are low.

Based on hourly analysis, a maximum reading of raw water turbidity was 99.98 NTU. The annual average Turbidity was 4.58 NTU.

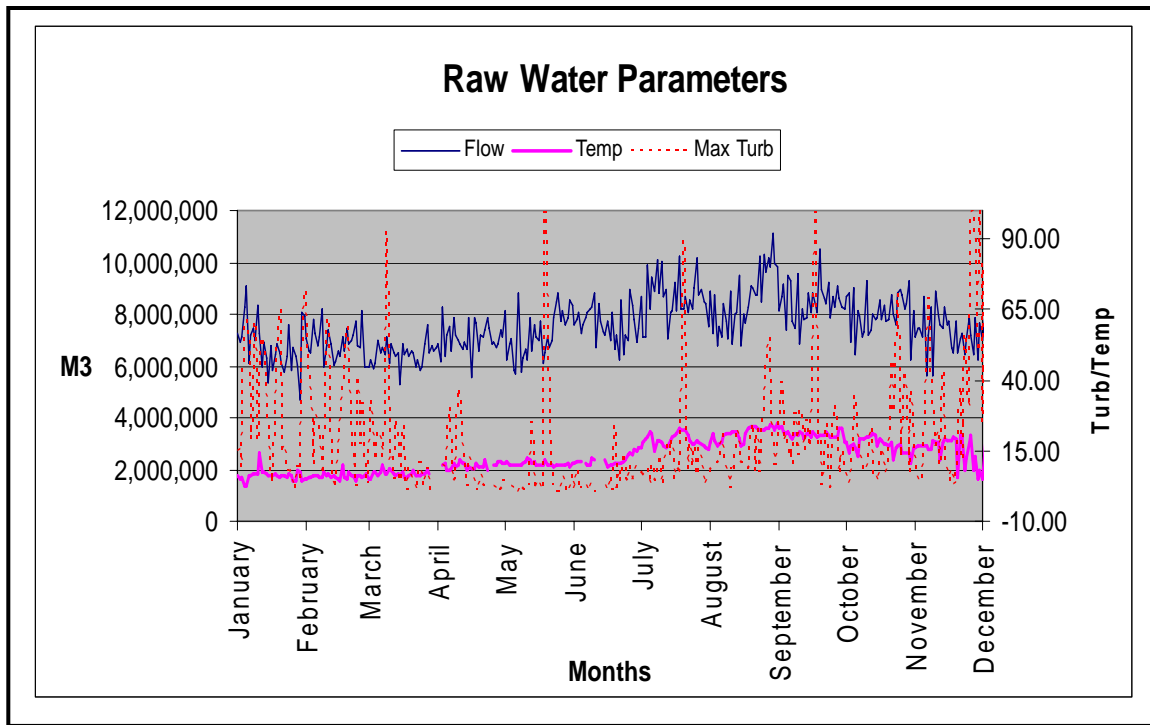


Figure 5-1 Plot of Raw Water Turbidity, Temperature and Flow

Statistical analyses of the hourly permeate water turbidity data is presented in Table 5-2. As shown, treated water turbidity readings from all of the four membrane trains averaged between 0.03 – 0.08 NTU.

Table 5-2 Analysis of Hourly Permeate Water Turbidity Data

Train No.	Sample Count	Average	Maximum	% of time < 0.1 NTU
1	On-line	0.03	0.04	100
2	On-line	0.03	0.08	100
3	On-line	0.03	0.05	100
4	On-line	0.03	0.06	100

5.5

5.6 DISTRIBUTION CHLORINE RESIDUALS

The Procedure for Disinfection of Drinking Water in Ontario states that “The distribution system must be operated such that at all times and at all locations within the distribution system there is at least a detectable free chlorine residual of 0.05 mg/L at a pH 8.5 or lower, or where monochloramine is used, a combined chlorine residual of 0.25 mg/L”.



O. Reg. 170/03, Schedule 16-3.4 requires and states that the distribution water quality is considered to be adverse if the free chlorine residual is measured to be less than 0.05 mg/L. The corrective action is to restore chlorination immediately and follow the instructions as directed by the Medical Officer of Health.

The Municipality has implemented the following procedures to comply with Reg. 170/03:

- Scheduled flushing of dead end water mains;
- Chlorine addition at the Zone two (2) Reservoir; and,
- Initiation of a “Capital Works” program to replace all 100 mm cast iron water main and loop dead ends within the next ten (10) years.

A statistical analysis of the free chlorine residuals measured in the distribution system is presented in Table 5-3. Table 5-3 shows zero (0) samples being below 0.2 mg/L.

Table 5-3 Distribution Free Chlorine Residuals

Location	Sample Count	Minimum mg/L	Maximum mg/L	Average mg/L	% of time < 0.05 mg/L ²	% of time < 0.2 mg/L ¹
Distribution System	372	0.20	1.50	0.94	0	0
Notes:						
1. 1 sample was recorded at 0.20 mg/L.						
2. 0 samples were below 0.05 mg/L						

5.7

5.8 SUPERNATANT TOTAL SUSPENDED SOLIDS

Condition 4.4 in the CofA states that the annual average concentration of suspended solids (TSS) in the effluent discharged from the backwash wastewater facilities shall not exceed 25 mg/L. Condition 5.6 requires sampling to occur monthly.

A statistical analysis of the supernatant total suspended solids (Table 5-4) shows that the annual average concentration of suspended solids has not exceeded the discharge limit of 25 mg/L.

Table 5-4 Supernatant Total Suspended Solids

Location	Sample Count	Minimum	Maximum	Annual Average	% of time < 25 mg/L
Supernatant Discharge at Outfall	12	5.0	38.0	13.33	83



5.9 OTHER PARAMETERS

Table 5-5 lists the deviations or exceedances of other water samples summarized in **Appendix B** and deviations from Ontario Drinking Water Quality Standards (ODWQS) and Ontario Drinking Water Quality Objectives and Guidelines (ODWQOG).

Table 5-5 Deviations from ODWQS and ODWQOG

Parameter	Location	Limit	Exceedances	Comments
Raw Water				
Organic Nitrogen	Plant	0.15 mg/L (OG)	0.21 mg/L	Uncontrolled parameter
Temperature	Plant	15 C (OG)	0.00 – 24.80	Uncontrolled parameter
Hardness (as CaCO ₃)	Plant	80-100 (AO)	126	Uncontrolled parameter
pH	Plant	6.5 – 8.5	0.00 – 12.40	Uncontrolled parameter
Treated Water				
Turbidity	Plant	1 NTU	Rusty in plant discharge mains when Highlift pump No. 1 started, change pump sequence to keep pump more active. >1 NTU	Pump sequence changed to allow higher frequency of pump operation.
pH	Plant	6.5 – 8.5		Uncontrolled parameter
Hardness (as CaCO ₃)	Plant	80-100 (AO)	123	Uncontrolled parameter
Temperature	Plant	15 (OG)	2.0 – 23.0	Uncontrolled parameter
Distribution Water				
-	-	-	-	-

5.10

5.11 MINISTRY OF THE ENVIRONMENT ORDERS

Table 5-6 lists Ministry of the Environment orders and actions taken to resolve these orders.

Table 5-6 Ministry of the Environment Orders

Date of notification	Location	Order No.	Description	Comments
N/A	-	-	-	-



6. COMPLIANCE WITH TERMS AND CONDITIONS OF THE CERTIFICATE OF APPROVAL (COFA)

This section provides a statement as to compliance with all of the terms and conditions of the Certificate of Approval (CofA), and a detailed description of the measures taken to ensure compliance with the CofA, including any supporting data or other information.

Statement as to Compliance with Terms and Conditions of CofA

- 6.1.1 A checklist was used throughout the year to determine compliance with the latest CofA. This checklist includes the requirements of all the Terms and Conditions of this Certificate.

6.2 MEASURES TAKEN TO ENSURE COMPLIANCE WITH TERMS AND CONDITIONS OF C OF A.

Section 7 lists all the non-compliance items extracted from the checklist with explanations for the non-compliance.

6.3 COMPLIANCE WITH ONTARIO ACTS, REGULATIONS AND ORDERS

The third quarter sample for Nitrite/Nitrate was not collected and thus resulting in a non compliance issue for that quarter.

The Maximum Acceptable Concentration (MAC) for Nitrite/Nitrate is 10 mg/L, historic analysis of this parameter has shown that sample results range from 0.225 – 0.603 mg/L. This would indicate an *extremely low* probability of any health related issues resulting from this missed analysis.

The Regional Office of the Ministry of the Environment (MOE) was notified of this deficiency. Through consultation with the MOE we have since trained all Water Treatment operations Staff in the requirements for sampling of the applicable regulations, increased all baseline sampling schedules to buffer against non-compliance issues, strengthened our sampling procedures with respect to a two tiered requirement for analysis authorization.



NON-COMPLIANCE WITH TERMS AND CONDITIONS OF THE CERTIFICATE OF APPROVAL (COFA)

This section provides details of any non-compliance in 2008 with the Terms and Conditions of the latest Certificate of Approval (CofA), as well as details of how and when the non-compliance was corrected.

Table 0-1 Non-Compliance Items in the Terms and Conditions of the CofA

Item No.	Description	Date of Occurrence	Date of Correction	Method of Correction
1	-	-	-	-
2	-	-	-	-

As shown, the Port Hope Water Treatment Plant **fully compliant** with the applicable Certificate of Approval.



7. REFERENCES

- | | |
|--------------------|---|
| KMK, 2003 | KMK Consultants Limited. January 2003. New 20 ML/D Ultrafiltration Water Treatment Plant, Design Brief. |
| MOE, Sept. 1, 2007 | Ontario Ministry of the Environment, Ontario Water Resources Act |
| MOE, Aug. 20, 2007 | Ontario Ministry of the Environment, Safe Drinking Water Act. |
| MOE, June 2006 | Ontario Ministry of the Environment, Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines. PIBS #4449e01. |
| MOE, 2003 | Ontario Ministry of the Environment, Ontario Regulation 170/03 Drinking-Water Systems. |
| MOE, June 4/06 | Ontario Ministry of the Environment, Procedure for Disinfection of Drinking Water in Ontario. |
| MOE, 2005 | Ontario Ministry of the Environment, Drinking Water Surveillance Reports. |
| MOE Aug. 1/04 | Ontario Ministry of the Environment, Certification Guide for Operators and Water Quality Analysts of Drinking Water Systems. Ont. Reg. 128/04 |

APPENDICES

APPENDICES

APPENDIX A

SAMPLING PROGRAM

APPENDIX A

Table A-1 Sampling Protocol

Parameter	Frequency	Parameters Analyzed
Raw Water		
Required		
Microbiological	Weekly	E. Coli, Total Coliform, (excluding HPC or BKG), Ont. Reg. 170/03, Schedule 10
Turbidity	Continuous	Turbidity
pH	Continuous	pH
Temperature	Continuous at Low Lift, Twice Daily	Temperature
Chlorine Residual	Continuous at Lowlift Analyser (Zebra Mussel control)	Free Chlorine
Radionuclide	Annually	Gross alpha, gross beta and tritium
Additional		
Objective Parameters	Annually	Table 4 in Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines.
Treated Water		
Required		
Microbiological	Weekly (1 sample)	E. Coli, Total Coliform, HPC, Ont. Reg. 170/03, Schedule 10
Turbidity	Continuous	Turbidity
Chlorine (primary and secondary disinfection)	Continuous	Free Chlorine
Inorganics	Annually	Ont. Reg. 170/03, Schedule 23
Pesticides & PCB	Annually	Ont. Reg. 170/03, Schedule 24
Nitrates/Nitrites	Quarterly	Nitrates/Nitrites
pH	Continuous	pH
Sodium	Annually	Sodium
Arsenic	Weekly	Arsenic
Uranium	Weekly	Uranium
Radionuclide ¹	Annually	Gross alpha, gross beta and tritium
Additional		
Temperature	Twice Daily	Temperature

APPENDIX A

Parameter	Frequency	Parameters Analyzed
Objective Parameters	Annually	Table 4 in Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines.
-	-	-
Distribution Water		
Required		
Microbiological	Weekly (7 Weekly) ²	E. Coli, Total Coliform, HPC, Ont. Reg. 170/03, Schedule 10
Chlorine	Grab samples simultaneous to microbiological samples and continuous measurement at Jocelyn St. Reservoir	Free Chlorine
Volatile Organics	Quarterly (THM at a point reflecting maximum residence time in the distribution system)	THM
Inorganics	Annually (Lead at a point reflecting maximum residence time in the distribution system)	Only Lead
Additional		
-	-	-
Process Wastewater Effluent to Lake Ontario		
Required		
Total Suspended Solids	Monthly (composite)	Total Suspended Solids
Total Chlorine	Once daily	Total Chlorine
Additional		
pH	Monthly	pH
Turbidity	Monthly	Turbidity (NTU)
<p>Note:</p> <ol style="list-style-type: none"> 1. Sampled by Port Hope staff weekly for the Health Protection Branch of Health Canada, and quarterly when inorganic sampling is done. 2. Ont. Reg. 170/03, 10-2,(a) "if the system serves 100,000 people or less, at least eight distribution samples, plus one additional sample for every 1000 people served by the system, are taken every month, with at least one of the samples being taken in each week". Given a population of 12,500, this equals to a minimum of 21 samples. 		

APPENDIX A

Table A-2 Schedules 23 and 24 in Regulation 170/03, Drinking Water Systems made under Safe Drinking Water Act.

Schedule 23 – Inorganic Parameters		
Antimony Arsenic Barium	Boron Cadmium Chromium	Mercury Selenium Uranium
Schedule 24– Organic Parameters		
Alachlor Aldicarb Aldrin + Dieldrin Atrazine+N-dealkylated metabolites Azinphos-methyl Bendiocarb Benzene Benzo(a)pyrene Bromate Bromoxynil Carbaryl Carbofuran Carbon Tetrachloride Chlordane (Total) Chlorpyrifos Cyanazine Diazinon 1,2-Dichlorobenzene 1,4-Dichlorobenzene Dicamba Dichlorodiphenyltrichloroethane(DDT)+metab-olites	1,2-dichloroethane 1,1-Dichloroethylene (vinylidene chloride) Dichloromethane 2-4-Dichlorophenol 2,4-Dichlorophenoxy acetic acid (2,4-D) Diclofop-methyl Dimethoate Dinoseb Diquat Diuron Glyphosate Heptachlor+ Heptachlor Epoxide Lindane (Total) Malathion Methoxychlor Metolachlor Metribuzin	Monochlorobenzene Paraquat Parathion Pentachlorophenol Phorate Picloram Polychlorinated Biphenyls (PCB) Prometryne Simazine Temephos Terbufos Tetrachloroethylene (perchloroethylene) 2,3,4,6-Tetrachlorophenol Triallate Trichloroethylene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenoxy acetic acid- (2,4,5-T) Trifluralin Vinyl Chloride

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SAMPLING RESULTS

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SAMPLING RESULTS

This Appendix contains the following tables:

Table No.	Title
A-1	Legends for Tables
B-1	Raw Water, Schedule 23, Inorganic Parameters
B-1A	Raw Water, Schedule 24, Organic Parameters
B-1B	Raw water, Parameters not previously identified
C-2	Treated Water, Schedule 23, Inorganic Parameters,
C-2A	Treated Water, Schedule 24, Organic Parameters
C-2B	Treated Water, Parameters not previously identified
D-4	Distribution Water, Schedule 23
D-4A	Distribution Water, Schedule 24
D-4B	Distribution Water, Parameters not previously identified
B-5	Raw Water, Bacteriological Data
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D-7	Distribution Water, Bacteriological Data
B-8	Raw Water, Radionuclide Analysis
C-9	Treated Water, Radionuclide Analysis
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B-11	Raw Water, Table 4, Non-Health Related Chemical/Physical Characteristics
C-12	Treated Water, Table 4, Non-Health Related Chemical/Physical Characteristics
D-13	Distribution Water, Table 4, Non-Health Related Chemical/Physical Characteristics

Table A-1 Legends for Tables B-2 to D-13

Legend	Definition
AO	Aesthetic Objective
Average	Refers to the Average value measured
D	Deteriorating
Exceed.'s	Refers to the number of exceedances detected for the sample period described
IMAC	Interim Maximum Acceptable Concentration
MAC	Maximum Acceptable Concentration
Maximum	Refers to the maximum value measured

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Minimum	Refers to the minimum value measured
<MDL	Parameter results are lower than the method detectable limit
NA	Not Applicable
ND	Not Detected
NT	Not Tested
OG	Operational Guideline
S	Safe
SC	Samples Collected
US	Unsafe

Table B-1 Raw Water, Schedule 23, Inorganic Parameters

Parameter	ODWQS (mg/L unless noted)	2008		
		# of Samples	Results (mg/L)	Exceedance
Antimony	0.006 (MAC)	0	-	-
Arsenic	0.025 (IMAC)	0	-	-
Barium	1.0 (MAC)	0	-	-
Boron	5.0 (IMAC)	0	-	-
Cadmium	0.005 (MAC)	0	-	-
Chromium	0.05 (MAC)	0	-	-
Mercury	0.001 (MAC)	0	-	-
Selenium	0.01 (MAC)	0	-	-
Uranium	0.02 (MAC)	0	-	-

Table B-1A Raw Water, Schedule 24, Organic Parameters

Parameter	ODWQS (mg/L unless noted)	2008		
		# of Samples	Results (mg/L)	Exceedance
Alachlor	0.005 (IMAC)	0	-	-
Aldicarb	0.009 (MAC)	0	-	-
Aldrin + Dieldrin	0.0007 (MAC)	0	-	-
Atrazine + N-dealkylated metabolites	0.005 (IMAC)	0	-	-
Azinphos-methyl	0.02 (MAC)	0	-	-
Bendiocarb	.04 (MAC)	0	-	-
Benzene	0.005 (MAC)	0	-	-

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Parameter	ODWQS (mg/L unless noted)	2008		
		# of Samples	Results (mg/L)	Exceedance
Benzo(a)pyrene	0.00001 (MAC)	1	0.000004 <MDL	No
Bromoxynil	0.005 (MAC)	0	-	-
Carbaryl	0.09 (MAC)	0	-	-
Carbofuran	0.09 (MAC)	0	-	-
Carbon Tetrachloride	0.005 (MAC)	0	-	-
Chlordane (Total)	0.007 (MAC)	0	-	-
Chlorpyrifos	0.09 (MAC)	0	-	-
Cyanazine	0.01 (IMAC)	0	-	-
Diazinon	0.02 (MAC)	0	-	-
Dicamba	0.12 (MAC)	0	-	-
1,2-Dichlorobenzene	0.2 (MAC),	1	0.00050 <MDL	No
1,4-Dichlorobenzene	0.005 (MAC), 0.001 (AO)	1	0.00021 <MDL	No
Dichlorodiphenyltrichloroethane (DDT) + metabolites	0.03 (MAC)	0		-
1,2-dichloroethane	0.005 (IMAC)	0		-
1,1-Dichloroethylene (vinylidene chloride)	0.014 (MAC)	0	-	-
Dichloromethane	0.05 (MAC)	0		-
2,4-Dichlorophenol	0.9 (MAC), 0.0003 (AO)	1	.00015 <MDL	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	0.1 (IMAC)	0	-	-
Diclofop-methyl	0.009 (MAC)	0	-	-
Dimethoate	0.02 (IMAC)	0	-	-
Dinoseb	0.010 (IMAC)	0	-	-
Diquat	0.07 (MAC)	0	-	-
Diuron	0.15 (MAC)	0	-	-
Glyphosate	0.28 (IMAC)	0	-	-
Heptachlor + Heptachlor Epoxide	0.003 (MAC)	0	-	-
Lindane (Total)	0.004 (MAC)	0	-	-
Malathion	0.19 (MAC)	0	-	-
Methoxychlor	0.9 (MAC)	0	-	-
Metolachlor	0.05 (IMAC)	0	-	-

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Parameter	ODWQS (mg/L unless noted)	2008		
		# of Samples	Results (mg/L)	Exceedance
Metribuzin	0.08 (MAC)	0	-	-
Monochlorobenzene	0.08 (MAC), 0.03 (AO)	1	.000058<MDL	No
Paraquat	0.01 (IMAC)	0	-	-
Parathion	0.05 (MAC)	0	-	-
Pentachlorophenol	0.06 (MAC) 0.03 (AO)	1	.00015<MDL	No
Phorate	0.002 (IMAC)	0	-	-
Picloram	0.19 (IMAC)	0	-	-
Polychlorinated Biphenyls (PCB)	0.003 (IMAC)	0	-	-
Prometryne	0.001 (IMAC)	0	-	-
Simazine	0.01 (IMAC)	0	-	-
Temephos	0.28 (IMAC)	0	-	-
Terbufos	0.001 (IMAC)	0	-	-
Tetrachloroethylene (perchloroethylene)	0.030 (MAC)	0	-	-
2,3,4,6-Tetrachlorophenol	0.10 (MAC) .001 (OG/AO)	0	.00014<MDL	No
Triallate	0.23 (MAC)	0	-	-
Trichloroethylene	0.05 (MAC)	0	-	-
2,4,6-Trichlorophenol	0.005 (MAC) 0.002 (AO)	0	.00025<MDL	No
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	0.28 (MAC) 0.02 (AO)	1	0.00022 <MDL	-
Trifluralin	0.045 (IMAC)	0	-	-
Vinyl Chloride	0.002 (MAC)	0	-	-

Table B-1B Raw Water, Parameters not previously identified

Parameter	ODWQS (mg/L unless noted)	2008				
		SC	Minimum	Maximum	Average	Exceed's
Ammonia+Ammonium (N)	-	1	0.04 <MDL	0.04 <MDL	0.04 <MDL	No
Geosmin	ng/L	1	3 <MDL	3 <MDL	3 <MDL	No

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Parameter	ODWQS (mg/L unless noted)	2008				
		SC	Minimum	Maximum	Average	Exceed's
Hydrogen Sulphide	-	1	0.000004 <MDL	0.000004 <MDL	0.000004 <MDL	No
MIB	ng/L	1	3 <MDL	3 <MDL	3 <MDL	No
Nitrogen-Kjeldahl (N)	-	1	0.18	0.18	0.18	No

Table C-2 Treated Water, Schedule 23, Inorganic Parameters

Parameter	ODWQS (mg/L unless noted)	2008		
		# of Samples	Results (mg/L)	Exceedance
Antimony	0.006 (MAC)	1	0.00009<MDL	No
Arsenic	0.025 (IMAC)	1	0.0017<MDL	No
Barium	1.0 (MAC)	1	0.0228	No
Boron	5.0 (IMAC)	1	0.0232	No
Cadmium	0.005 MAC)	1	0.000003MDL	No
Chromium	0.05 (MAC)	1	0.0005<MDL	No
Mercury	0.001(MAC)	1	0.00002<MDL	No
Selenium	0.01 (MAC)	1	0.001<MDL	No
Uranium	0.02 (MAC)	56	0.00001 - 0.000599	No

Table C-2A Treated Water, Schedule 24, Organic Parameters

Parameter	ODWQS (mg/L unless noted)	2008		
		# of Samples	Results (mg/L)	Exceedance
Alachlor	0.005 (IMAC)	1	0.00011 <MDL	No
Aldicarb	0.009 (MAC)	1	0.00030 <MDL	No
Aldrin + Dieldrin	0.0007 (MAC)	1	0.000067 <MDL	No
Atrazine + N-dealkylated metabolites	0.005 (IMAC)	1	0.00012 <MDL	No
Azinphos-methyl	0.02 (MAC)	1	0.00021 <MDL	No
Bendiocarb	.04 (MAC)	1	0.00013 <MDL	No

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Parameter	ODWQS (mg/L unless noted)	2008		
		# of Samples	Results (mg/L)	Exceedance
Benzene	0.005 (MAC)	1	0.00037 <MDL	No
Benzo(a)pyrene	0.00001 (MAC)	1	0.000004 <MDL	No
Bromoxynil	0.005 (MAC)	1	0.00033 <MDL	No
Carbaryl	0.09(MAC)	1	0.00016 <MDL	No
Carbofuran	0.09 (MAC)	1	0.00037 <MDL	No
Carbon Tetrachloride	0.005 (MAC)	1	0.00041 <MDL	No
Chlordane (Total)	0.007 (MAC)	1	0.00011 <MDL	No
Chlorpyrifos	0.09 (MAC)	1	0.00018 <MDL	No
Cyanazine	0.01 (IMAC)	1	0.00018 <MDL	No
Diazinon	0.02 (MAC)	1	0.000081 <MDL	No
Dicamba	0.12 (MAC)	1	0.00020 <MDL	No
1,2-Dichlorobenzene	0.2 (MAC),	1	0.00050 <MDL	No
1,4-Dichlorobenzene	0.005 (MAC), 0.001 (AO)	1	0.00021 <MDL	No
Dichlorodiphenyltrichloro ethane (DDT) + metabolites	0.03 (MAC)	1	0.00014 <MDL	No
1,2-dichloroethane	0.005 (IMAC)	1	0.00043 <MDL	No
1,1-Dichloroethylene (vinylidene chloride)	0.014 (MAC)	1	0.00041 <MDL	No
Dichloromethane	0.05 (MAC)	1	0.00034 <MDL	No
2-4-Dichlorophenol	0.9 (MAC), 0.0003 (AO)	1	0.00015 <MDL	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	0.1 (IMAC)	1	0.00019 <MDL	No
Diclofop-methyl	0.009 (MAC)	1	0.00040 <MDL	No
Dimethoate	0.02 (IMAC)	1	0.00012 <MDL	No
Dinoseb	0.010 (IMAC)	1	0.00036 <MDL	No
Diquat	0.07 (MAC)	1	0.001 <MDL	No
Diuron	0.15 (MAC)	1	0.000087 <MDL	No
Glyphosate	0.28 (IMAC)	1	0.006 <MDL	No

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Parameter	ODWQS (mg/L unless noted)	2008		
		# of Samples	Results (mg/L)	Exceedance
Heptachlor + Heptachlor Epoxide	0.003 (MAC)	1	0.00011 <MDL	No
Lindane (Total)	0.004 (MAC)	1	0.000056 <MDL	No
Malathion	0.19 (MAC)	1	0.000091 <MDL	No
Methoxychlor	0.9 (MAC)	1	0.00014 <MDL	No
Metolachlor	0.05 (IMAC)	1	0.000092 <MDL	No
Metribuzin	0.08 (MAC)	1	0.00012 <MDL	No
Monochlorobenzene	0.08 (MAC), 0.03 (AO)	1	0.00058 <MDL	No
Paraquat	0.01 (IMAC)	1	0.001 <MDL	No
Parathion	0.05 (MAC)	1	0.00018 <MDL	No
Pentachlorophenol	0.06 (MAC) 0.03 (AO)	1	0.00015 <MDL	No
Phorate	0.002 (IMAC)	1	0.00011 <MDL	No
Picloram	0.19 (IMAC)	1	0.00025 <MDL	No
Polychlorinated Biphenyls (PCB)	0.003 (IMAC)	1	0.00004 <MDL	No
Prometryne	0.001 (IMAC)	1	0.00023 <MDL	No
Simazine	0.01 (IMAC)	1	0.00015 <MDL	No
Temephos	0.28 (IMAC)	1	0.00031 <MDL	No
Terbufos	0.001 (IMAC)	1	0.00012 <MDL	No
Tetrachloroethylene (perchloroethylene)	0.030 (MAC)	1	0.00045 <MDL	No
2,3,4,6-Tetrachlorophenol	0.10 (MAC)	1	0.00014	No
Triallate	0.23 (MAC)	1	0.00010 <MDL	No
Trichloroethylene	0.05 (MAC)	1	0.00038 <MDL	No
2,4,6-Trichlorophenol	0.005 (MAC) 0.002 (AO)	1	0.00025	No
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	0.28 (MAC) 0.02 (AO)	1	0.00022	No
Trifluralin	0.045 (IMAC)	1	0.00012 <MDL	No
Vinyl Chloride	0.002 (MAC)	1	0.00017 <MDL	No

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Table C-2B Treated Water, Parameters not previously identified

Parameter	(mg/L unless noted)	2008				
		SC	Minimum	Maximum	Average	Exceed's
Ammonia+Ammonium (N)	-	1	0.21	0.21	0.21	No
Dieldrin	-	1	0.000067 <MDL	0.000067 <MDL	0.000067 <MDL	No
Fluoride	-	1	0.14	0.14	0.14	No
Geosmin	ng/L	1	3 <MDL	3 <MDL	3 <MDL	No
Hydrogen Sulphide	-	1	0.000004 <MDL	0.000004 <MDL	0.000004 <MDL	No
MIB	ng/L	1	3 <MDL	3 <MDL	3 <MDL	No
Nitrogen-Kjeldahl (N)	-	1	0.19	0.19	0.19	No
Oxychlorane	-	1	0.000011 <MDL	0.000011 <MDL	0.000011 <MDL	No

Table D-4 Distribution Water, Schedule 23, Inorganic Parameters

Parameter	(mg/L unless noted)	2008		
		# of Samples	Results (mg/L)	Exceedance
Antimony	0.006 (MAC)	-	-	-
Arsenic	0.025 (IMAC)	-	-	-
Barium	1.0 (MAC)	-	-	-
Boron	5.0 (IMAC)	-	-	-
Cadmium	0.005 (MAC)	-	-	-
Chromium	0.05 (MAC)	-	-	-
Mercury	0.001 (MAC)	-	-	-
Selenium	0.01 (MAC)	-	-	-
Uranium	0.02 (MAC)	-	-	-

Table D-4A Distribution Water, Schedule 24, Organic Parameters

Parameter	ODWQS (mg/L unless noted)	2008		
		# of Samples	Results (mg/L)	Exceedance
Alachlor	0.005 (IMAC)	0	-	-

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Parameter	ODWQS (mg/L unless noted)	2008		
		# of Samples	Results (mg/L)	Exceedance
Aldicarb	0.009 (MAC)	0	-	-
Aldrin + Dieldrin	0.0007 (MAC)	0	-	-
Atrazine + N-dealkylated metabolites	0.005 (IMAC)	0	-	-
Azinphos-methyl	0.02 (MAC)	0	-	-
Bendiocarb	.04 (MAC)	0	-	-
Benzene	0.005 (MAC)	0	-	-
Benzo(a)pyrene	0.00001 (MAC)	0	-	-
Bromoxynil	0.005 (MAC)	0	-	-
Carbaryl	0.09(MAC)	0	-	-
Carbofuran	0.09 (MAC)	0	-	-
Carbon Tetrachloride	0.005 (MAC)	0		
Chlordane (Total)	0.007 (MAC)	0	-	-
Chlorpyrifos	0.09 (MAC)	0	-	-
Cyanazine	0.01 (IMAC)	0	-	-
Diazinon	0.02 (MAC)	0	-	-
Dicamba	0.12 (MAC)	0	-	-
1,2-Dichlorobenzene	0.2 (MAC),	0		
1,4-Dichlorobenzene	0.005(MAC), 0.001 (AO)	0	-	-
Dichlorodiphenyltrichloro ethane (DDT) + metabolites	0.03 (MAC)	0	-	-
1,2-dichloroethane	0.005 (IMAC)	0		
1,1-Dichloroethylene (vinylidene chloride)	0.014 (MAC)	0	-	-
Dichloromethane	0.05 (MAC)	0		
2-4-Dichlorophenol	0.9(MAC), 0.0003 (AO)	0	-	-
2,4-Dichlorophenoxy acetic acid (2,4-D)	0.1 (IMAC)	0	-	-
Diclofop-methyl	0.009 (MAC)	0	-	-
Dimethoate	0.02 (IMAC)	0	-	-

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Parameter	ODWQS (mg/L unless noted)	2008		
		# of Samples	Results (mg/L)	Exceedance
Dinoseb	0.010 (IMAC)	0	-	-
Diquat	0.07 (MAC)	0	-	-
Diuron	0.15 (MAC)	0	-	-
Glyphosate	0.28 (IMAC)	0	-	-
Heptachlor + Heptachlor Epoxide	0.003 (MAC)	0	-	-
Lindane (Total)	0.004 (MAC)	0	-	-
Malathion	0.19 (MAC)	0	-	-
Methoxychlor	0.9 (MAC)	0	-	-
Metolachlor	0.05 (IMAC)	0	-	-
Metribuzin	0.08 (MAC)	0	-	-
Monochlorobenzene	0.08(MAC), 0.03 (AO)	0	-	-
Paraquat	0.01 (IMAC)	0	-	-
Parathion	0.05 (MAC)	0	-	-
Pentachlorophenol	0.06(MAC) .03(AO)	0	-	-
Phorate	0.002 (IMAC)	0	-	-
Picloram	0.19 (IMAC)	0	-	-
Polychlorinated Biphenyls (PCB)	0.003 (IMAC)	0	-	-
Prometryne	0.001 (IMAC)	0	-	-
Simazine	0.01 (IMAC)	0	-	-
Temephos	0.28 (IMAC)	0	-	-
Terbufos	0.001 (IMAC)	0	-	-
Tetrachloroethylene (perchloroethylene)	0.030 (MAC)	0	-	-
2,3,4,6-Tetrachlorophenol	0.10 (MAC)	0	-	-
Triallate	0.23 (MAC)	0	-	-
Trichloroethylene	0.05 (MAC)	0	-	-
2,4,6-Trichlorophenol	0.005(MAC) 0.002 (AO)	0	-	-

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Parameter	ODWQS (mg/L unless noted)	2008		
		# of Samples	Results (mg/L)	Exceedance
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	0.28 (MAC) 0.02 (AO)	0	-	-
Trifluralin	0.045 (IMAC)	0	-	-
Vinyl Chloride	0.002 (MAC)	0	-	-

Table D-4B Distribution Water, Parameters not previously identified

Parameter	(mg/L unless noted)	2008				
		SC	Minimum	Maximum	Average	Exceed's
Trihalomethanes	0.100	4	0.023	0.041	0.0325	No
Lead (Distribution)	0.010 (MAC)	25	0.00003	0.0028	-	No
Lead (Non-residential)	0.010 (MAC)	12	0.00006	0.0016	-	No
Lead (Residential)	0.010 (MAC)	123	0.00005	0.0183 ^a	-	Yes ^a
Trihalomethanes	0.100	4	0.022	0.032	0.025	No

Notes:

a – A total of two (2) residential samples exceeded the MAC of 10 ug/L, these are not considered adverse samples due to the fact they originated from private home plumbing systems.

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Table B-5 Raw Water, Bacteriological Data

Year	Total Coliform (org/100 mL)					Fecal Coliform/ <i>Escherichia coli</i> (org/100 mL)				
	SC	0	< 200	> 200	> 300	SC	0	< 200	> 200	> 300
January	5	1	3	0	1	5	3	2	0	0
February	4	0	4	0	0	4	2	2	0	0
March	4	1	3	0	0	4	3	1	0	0
April	5	1	4	0	0	5	4	1	0	0
May	4	1	2	0	0	4	4	0	0	0
June	4	3	1	0	0	4	4	0	0	0
July	5	2	3	0	0	5	4	1	0	0
August	4	1	3	0	0	4	3	1	0	0
September	5	4	1	0	0	5	5	0	0	0
October	4	4	0	0	0	4	4	0	0	0
November	4	1	2	1	0	4	3	1	0	0
December	5	0	3	2	2	5	1	4	0	0
TOTAL	53	19	29	3	3	53	40	13	0	0

Table C-6 Treated Water, Bacteriological Data

Year	Total Coliform			Fecal Coliform/ <i>Escherichia coli</i>			HETEROTROPHIC PLATE COUNT			
	SC	S	US	SC	S	US	SC	S	US	D
January	5	5	0	5	5	0	5	5	0	0
February	4	4	0	4	4	0	4	4	0	0
March	4	4	0	4	4	0	4	4	0	0
April	5	5	0	5	5	0	5	5	0	0
May	4	4	0	4	4	0	4	4	0	0
June	4	4	0	4	4	0	4	4	0	1
July ¹	5	5	0	5	5	0	5	5	0	0
August	4	4	0	4	4	0	4	4	0	0
September	5	5	0	5	5	0	5	5	0	1
October	4	4	0	4	4	0	4	4	0	0
November	4	4	0	4	4	0	4	4	0	0
December	5	5	0	5	5	0	5	5	0	0
TOTAL	53	53	0	53	53	0	53	53	0	2

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Notes:

1. For Treated and Distribution waters, sampling for Background colonies was changed in June to sampling for Heterotrophic Plate Count analysis.

Table D-7 Distribution Water, Bacteriological Data

Year	Total Coliform			Fecal Coliform/ <i>Escherichia coli</i>			HETEROTROPHIC PLATE COUNT			
	SC	S	US	SC	S	US	SC	S	US	D
January	35	35	0	35	35	0	35	35	0	4
February	28	28	0	28	28	0	28	28	0	1
March	28	28	0	28	28	0	28	28	0	0
April	35	28	0	35	35	0	35	35	0	4
May	28	35	0	28	28	0	28	28	0	4
June	28	28	0	28	28	0	28	28	0	10
July	39	38 ¹	1	39	39	0	39	39	0	9
August	28	28	0	28	28	0	28	28	0	11
September	35	35	0	35	35	0	35	35	0	14
October	28	28	0	28	28	0	28	28	0	1
November	28	28	0	28	28	0	28	28	0	6
December	35	35	0	35	35	0	35	35	0	9
TOTAL	375	374	1	375	375	0	375	375	0	73

Notes:

1. See Table 5-1 for details.

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Table B-8 Raw Water, Radionuclide Analysis

Parameter	ODWQS	2008				
		SC	Minimum	Maximum	Average	Exceedances
Gross Alpha Emissions	Scan only	1	-	<0.1	-	No
Gross Beta Emissions	Scan only	1	-	0.1	-	No
Tritium	7000 Bq/L	1	-	<1000	-	No

Table C-9 Treated Water, Radionuclide Analysis

Parameter	ODWQS	2008				
		SC	Minimum	Maximum	Average	Exceedances
Gross Alpha Emissions	Scan only	1	-	-	-	-
Gross Beta Emissions	Scan only	1	-	-	-	-
Tritium	7000 Bq/L	1	-	-	-	-

Table D-10 Distribution Water, Radionuclide Analysis

Parameter	ODWQS	2008				
		SC	Minimum	Maximum	Average	Exceedances
Gross Alpha Emissions	Scan only	0	-	-	-	-
Gross Beta Emissions	Scan only	0	-	-	-	-
Tritium	7000 Bq/L	0	-	-	-	-

Table B-11 Raw Water, Table 4, Non-Health Related Chemical/Physical Characteristics

Parameter	ODWQS Table 4 (mg/L unless noted)	2008		
		# of Samples	Results	Exceedances
Alkalinity (as CaCO ₃)	30-500 (OG)	1	89	No
Aluminium	0.1 (OG)	1	0.010 <MDL	No
Calcium	-	1	35.4	No
Chloride	250 (AO)	1	28	No

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Parameter	ODWQS Table 4 (mg/L unless noted)	2008		
		# of Samples	Results	Exceedances
Colour	5 TCU (AO)	1	3 <MDL	No
Copper	1.0 (AO)	1	0.001	No
Dissolved Organic Carbon	5.0 (AO)	1	1.6	No
Ethylbenzene	0.0024 (AO)	1	0.00036 <MDL	No
Hardness (as CaCO ₃)	80-100 (AO)	1	126	Yes ¹
Iron	0.3 (AO)	1	0.010 <MDL	No
Magnesium	-	1	9.07	No
Manganese	0.05 (AO)	1	0.001 <MDL	No
Methane	3 L/m3 (AO)	1	0.006 <MDL	No
Odour	-	-	-	-
Organic Nitrogen	0.15 (OG)	1	0.21	Yes
pH	6.5-8.5 (OG)	continuous	8.19	No
Sodium	200 (OG)	1	13.2	No
Sulphate	500 (OG)	1	25	No
Sulphide	0.05 (OG)	1	0.004 <MDL	No
Taste	inoffensive	-	-	-
Temperature	15 (OG)	continuous	0.0 – 24.80	Yes
Toluene	0.024 (OG)	1	0.00039 <MDL	No
Total Dissolved Solids	500 (OG)	1	194	No
Turbidity	NTU	continuous	0.0 – 99.98	No
Xylenes (Total)	0.3 (OG)	1	0.00079 <MDL	No
Zinc	5.0 (OG)	1	0.010 <MDL	No

Notes:

A – See Table 5-5 for further information.

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Table C-12 Treated Water, Table 4, Non-Health Related Chemical/Physical Characteristics

Parameter	ODWQS Table 4 (mg/L unless noted)	2008		
		# of Samples	Results	Exceedances
Alkalinity (as CaCO ₃)	30-500 (OG)	1	89	No
Aluminium	0.1 (OG)	1	0.010 <MDL	No
Calcium	-	1	34.6	No
Chloride	250 (AO)	1	31	No
Colour	5 TCU (AO)	1	3 <MDL	No
Copper	1.0 (AO)	1	0.006	No
Dissolved Organic Carbon	5.0 (AO)	1	1.6	No
Ethylbenzene	0.0024 (AO)	1	0.00036 <MDL	No
Hardness (as CaCO ₃)	80-100 (AO)	1	123	Yes ^a
Iron	0.3 (AO)	1	0.010 <MDL	No
Magnesium	-	1	9.01	No
Manganese	0.05 (AO)	1	0.001 <MDL	No
Methane	3 L/m ³ (AO)	1	0.006 <MDL	No
Odour	Inoffensive (AO)	-	-	-
Organic Nitrogen	0.15 (OG)	1	0.05 <MDL	No
pH	6.5-8.5 (OG)	Continuous	7.70	No
Sodium	20 (OG)	1	12.8	No
Sulphate	500 (OG)	1	25	No
Sulphide	0.05 (OG)	-	-	-
Taste	(OG)	-	-	-
Temperature	15 C ^o (OG)	730	2.0 – 23.0	Yes ^a
Toluene	0.024 (OG)	1	0.00039 <MDL	No
Total Dissolved Solids	500 (OG)	1	197	No
Turbidity	1 NTU	Continuous	0.0 – 2.07	Yes ^b
Xylenes	.3 (OG)	1	0.00079 <MDL	No
Zinc	5	1	0.010 <MDL	No

APPENDIX B

Notes:

A – See Table 5-5 for further information.

B – See Table 5-1 for further information.

Table D-13 Distribution Water, Table 4, Non-Health Related Chemical/Physical Characteristics

Parameter	ODWQS Table 4 (mg/L unless noted)	2008		
		# of Samples	Results	Exceedances
Alkalinity (as CaCO ₃)	30-500 (OG)	0	-	-
Aluminium	0.1 (OG)	0	-	-
Chloride	250 (AO)	0	-	-
Colour	5 TCU (AO)	0	-	-
Copper	1.0 (AO)	0	-	-
Dissolved Organic Carbon	5.0 (AO)	0	-	-
Ethylbenzene	0.0024 (AO)	0	-	-
Hardness (as CaCO ₃)	80-100 (AO)	0	-	-
Iron	0.3 (AO)	0	-	-
Manganese	0.05 (AO)	0	-	-
Methane	3 L/m (AO)	0	-	-
Odour	Inoffensive (AO)	0	-	-
Organic Nitrogen	0.15 (OG)	0	-	-
pH	6.5-8.5 (OG)	0	-	-
Sodium	200 (OG)	0	-	-
Sulphate	500 (OG)	0	-	-
Sulphide	0.05 (OG)	0	-	-
Taste	(OG)	0	-	-
Temperature	15 (OG)	1	-	-
Toluene	0.024 (OG)	0	-	-
Total Dissolved Solids	500 (OG)	0	-	-
Xylenes	0.3 (OG)	0	-	-
Zinc	5.0 (OG)	0	-	-

APPENDIX C

Correspondence

APPENDIX C

Memorandum

To: Ontario Ministry of the Environment, Spills Action Centre, to whom it my concern
CC: Peter Angelo
From: Rick Trumper
Date: February 3, 2008
Re: Adverse water quality, **AWQI # 77709**

Hello,

This is written notice of an adverse water quality incident that has occurred at Water Treatment Plant in the Community of Port Hope.

We have experienced a Turbidity reading from an online turbidimeter that exceeded 1.0 NTU. This meter is located on our Treated water discharge header that feeds the distribution system. We feel the cause of this adverse was due to the start-up of a pump that was out of service for some time, thus creating rusty water.

If you or any of the MOE staff have any questions please call me at the numbers provided.

Yours Truly,

Rick Trumper
Water Treatment Supervisor
Municipality of Port Hope
Water Department

Phone (905) 885 -2209

Fax (905) 885-7509

Cell (905) 375-8004

APPENDIX C

Memorandum

To: Ministry of the Environment, Spills Action Centre, to whom it my concern
CC: Peter Angelo
From: Rick Trumper
Date: February 4, 2008
Re: Resolution to adverse water quality, **AWQI # 77709**

Hello,

This is written notice of resolution to an adverse water quality incident that has occurred at Water Treatment Plant in the Community of Port Hope.

A Turbidity reading from an online turbidimeter that exceeded 1.0 NTU. This meter is located on our Treated water discharge line that feeds the Distribution system. We feel the cause of this adverse was due to the start-up of a pump that was out of service for some time, thus creating rusty water.

We will rotate this pump in and out of duty to avoid future problems.

If you or any of the MOE staff have any questions please call me at the numbers provided.

Yours Truly,

Rick Trumper
Water Treatment Supervisor
Municipality of Port Hope
Water Department

Phone (905) 885 –2209
Fax (905) 885-7509
Cell (905) 375-8004

APPENDIX C

Memorandum

To: Whom it my concern
CC: Peter Angelo
From: Rick Trumper
Date: July 24, 2008
Re: Adverse water quality, **AWQI # 81582**

Hello,

This is written notice of an Adverse water quality incident that has occurred at a permanent sampling station located at Keith Place in the Community of Port Hope.

We will be re-sampling the system at the original location, up and down stream from the original location due to a parameter exceedance on July 24, 2008, AWQI No. 81582, for Total Coliform (6 colonies).

If you or any of the MOE staff have any questions please call me at the numbers provided.

Yours Truly,

Rick Trumper
Water Treatment Supervisor
Municipality of Port Hope
Water Department

Phone (905) 885 –2209
Fax (905) 885-7509
Cell (905) 375-8004

APPENDIX C

Memorandum

To: Whom it my concern
CC: Peter Angelo
From: Rick Trumper
Date: July 29, 2008
Re: Resolution to Adverse water quality **AWQI #81582**

Hello,

This is written notice of resolution to an adverse water quality incident dated July 24, 2008 at a permanent sampling location at Keith Place in the Municipality of Port Hope.

We have re-sampled the system at the original and other locations and the results returned showed that the parameter in question has returned below the MAC value.

We are requesting that this adverse incident be resolved.

If you or any of the MOE staff have any questions please contact me at the numbers provided.

Yours Truly,

Rick Trumper
Water Treatment Supervisor
Municipality of Port Hope
Water Department

Phone (905) 885 -2209
Fax (905) 885-7509
Cell (905) 375-8004