



2010 ANNUAL COMPLIANCE AND SUMMARY REPORT ON DRINKING WATER QUALITY

Certificate of Approval # PB220000807RR-01
Municipal Drinking Water Licence # 135-101
Drinking Water Works Permit # 135-201
Waterworks Identification No. 220000807

2010 ANNUAL SUMMARY REPORT FOR COUNCIL

INDEX

1. Brighton's Municipal Drinking Water System
 - 1.1 Raw Water Source
 - 1.2 Treatment Process
 - 1.3 Distribution System
 - 1.4 Consumption and Charges to Consumers

2. Drinking Water Systems Regulations
 - 2.1 The Safe Drinking Water Act, 2002
 - 2.2 The Drinking Water Protection Regulation (O.Reg.170/03)
 - 2.3 Sustainable Water and Sewage Systems Act, 2002
 - 2.4 Definitions

3. Requirements of the Drinking Water System Regulation
 - 3.1 Sample & Test
 - 3.2 Use an Accredited Laboratory
 - 3.3 Report Adverse Test Results
 - 3.4 Obtain a Certificate of Approval and a Permit to Take Water for a municipal residential drinking water system from the ministry
 - 3.5 Have certified operators or trained persons, depending on category of system
Municipal Non-residential compliance
 - 3.6 Prepare an annual report in order that the public has access to information on the status of drinking water
 - 3.7 Prepare an Annual Summary Report, on municipal residential systems for municipal Councillors
 - 3.8 MOE Annual Inspection Report Non-Compliance Finding

4. Upgrades to the Drinking Water System to Correct Deficiencies

5. Conclusion

APPENDICES

Appendix 1 - Brighton Well Supply System – 2010 Monthly Summary

Appendix 2 – Part III Drinking Water Systems Regulation O.Reg.170/03
– Annual Compliance Report to MOE

Appendix 3 – MOE Annual Inspection Report Non-Compliance Finding

Appendix 4 - Small Municipal Non-Residential Drinking Water Systems Annual Report

2010 ANNUAL SUMMARY REPORT FOR COUNCIL

A Summary Report for Municipalities, Schedule 22 of O. Reg. 170/03, has been prepared to assist Brighton's Municipal Council in understanding the capability and operation of the drinking water system and the quality of its water.

This report summarizes:

1. Brighton's Large Municipal Residential Drinking Water System
2. Ontario Drinking Water System Regulations
3. Requirements of the Regulations and System's Approvals
4. Upgrades Required to Correct Deficiencies

1. BRIGHTON'S MUNICIPAL DRINKING WATER SYSTEM

1.1 Raw Water Source

In 2010, water sources at the Brighton Well Supply consisted of three drilled wells. The only raw water source is groundwater which is captured from a deep aquifer by drilled wells located adjacent to the old Upper Reservoir site. There are three wells that draw water from the aquifer under the reservoir area: Well Nos. 1, 2 and 3 pumps work on rotation

The transition to a secure groundwater supply to meet O.Reg.170/03 and the Procedure for Disinfection of Drinking Water in Ontario included construction of the third well and a new storage facility. A fail safe control system has been installed to ensure that an upward hydraulic gradient is maintained at all times in the raw water supply aquifer. This system includes water level sensors in each observation and production well, an alarm system equipped with pre-determined set-points for well depth, and a SCADA data-log system. The work was completed and commissioned in October, 2005.

As part of Brighton's Turbidity Report-Action Plan and Implementation Schedule, mitigation measures included pumping to waste until turbidity levels were below 1.0 NTU.

1.2 Treatment Process

Disinfection of water to eliminate disease causing organisms is the most important step in the water treatment process. In October 2005 our upgraded system came on-line which changed our system from an open surface water reservoir system to an enclosed concrete storage reservoir. This enables us to have more contact time for chlorination; which is done by injecting Chlorine gas into the water as it enters into one of two cells (*which is called Pre-Chlorination*). The concrete water storage reservoir is approximately 39 m x 58 m, and consists of two cells. Each cell is equipped with baffles and provides $2800 \text{ m}^3 \times 2 = 5600 \text{ m}^3$ of water storage and equipped with overflow, drain system, piping and appurtenances, and a water main from the **Water Treatment Plant** (WTP) and reservoir to the existing distribution system (DS). A WTP building approximately 39 m x 10 m housing a primary and secondary disinfection system consisting of two (2) gas chlorinators, weigh scales, vacuum regulators, injectors and appurtenances to facilitate application of chlorine solution for pre-chlorination at a point where water enters either cell from the wells and also post-chlorination as water enters the DS. Instrumentation and controls including on-line chlorine residual analyzer and turbidity meters measure the chlorine residuals and turbidity in the reservoirs and the outlet to the DS. Emergency power is provided by an 80 kW pad mounted standby generator including automatic transfer switch. There is a drain/bypass line from the WTP and reservoirs to outfall through a bypass detention pond.

1.3 Distribution System

The Municipality of Brighton's distribution system provides drinking water to approximately 6300 residents through a network of approximately 60 km of piping and approximately 2,800 residential and commercial accounts, including Presqu'ile Park. Fire hydrants are maintained by the Water Department, which includes a flushing program to clean the mains and flush out dead-ends. This practice maintains the water quality in the distribution system and ensures the hydrants are in good repair. Chlorine residuals, as well as microbiological sampling and testing in the distribution system are checked on a weekly basis at a minimum of seven separate sites. Operators also test chlorine residuals on a daily basis in the distribution system as per O. Reg. 170/03.

Upgrades to the distribution system in 2010 included replacement of the watermain, hydrants and services on Crestview Ave. Additionally, two new subdivisions were added to our distribution system, these were Tackaberry Ridge (north Pinnacle St.) and Forest Hill (north of Lakeview Heights).

In 2010, there were 14 water leaks in the distribution system. There were 2 main line breaks and 12 services leaks. Most of the water leaks were caused by worn flared connection fittings and worn copper services lines.

1.4 Consumption and Charges to Consumers

Increasing monthly flows in the past number of years can be attributed to both weather patterns and an increased customer base. In 2010, a total of 946,853 m³ of water was used. Based on a population of 6300 residents on the distribution system, the per capita consumption was 150.3 m³/ person/year or 0.412m³ (412 Litres)/person/day. This equates to an average daily demand of 2,594.12 m³/day.

The average daily demand represents the average quantity of water treated at the water treatment plant. Peak day demand represents the highest volume of water treated over a single 24-hour period, usually the hottest day of the year or on a day with very high usage due to fire suppression. In 2010 the peak day demand occurred on May 30 with a recorded flow of 4,518 m³/day.

In 2010, sales at the *Municipal Public Water Dispenser* totaled of 37.6 m³.

By-law Number 274-2004 enacts the rules and regulations for the installation, repair, maintenance, and access to the Water Distribution System and appurtenant water meters, sanitary and storm sewer services and related appurtenances; the billing and collection of charges for water and sewer usage; and the penalties for offences of the water and sewer works in the Municipality of Brighton.

As part of the Municipality of Brighton's water conservation policy, the Water Conservation By-law No. 029-2001, is enforced annually from June 1st to September 15th. This by-law is

Municipality of Brighton 2010 Annual Report on Drinking Water Quality

maintained to regulate and restrict the unnecessary use of water for outdoor purposes within the serviced area. Staff monitor and enforce compliance to this by-law during the period with which it is in effect.

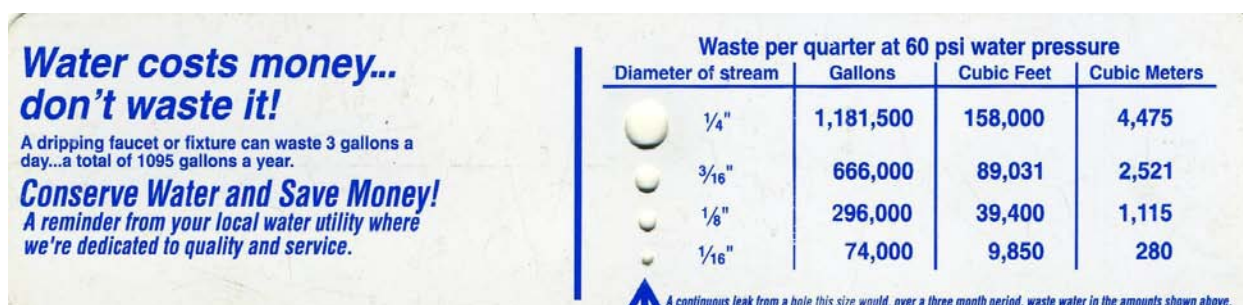


Table I - Water Consumption Flows (m³)

Water Consumption/ Flows m ³								
	2010	2009	2008	2007	2006	2005	2004	2003
January	70,251	75,560	72,685	58,718	82,272	70,952	71,970	78,265
February	62,285	65,591	72,548	56,628	69,405	71,484	68,580	70,877
March	66,588	75,067	69,936	63,579	76,039	69,759	79,259	75,369
April	72,462	78,919	72,738	65,329	72,884	61,223	72,723	70,619
May	99,693	94,465	82,706	89,653	86,572	69,198	79,911	80,476
June	86,521	94,392	94,990	105,967	89,064	89,504	89,335	86,909
July	99,838	99,835	92,364	99,390	85,591	91,527	87,648	98,759
August	99,291	101,839	86,357	107,735	93,161	89,244	86,528	96,356
September	80,517	88,957	83,154	96,781	68,548	82,643	78,125	90,002
October	72,963	70,873	74,101	79,923	65,398	81,680	76,815	75,261
November	65,237	66,742	71,396	70,758	63,636	80,713	74,115	72,510
December	71,208	70,205	74,067	74,357	59,960	79,890	72,995	70,377
Total Flow	946,853	982,445	947,042	968,818	911,530	937,827	938,004	965,781
Monthly Avg.	78,904	81,870	78,920	80,735	75,961	78,152	77,908	80,482
Monthly Max.	99,838	101,839	94,990	107,735	93,161	91,527	89,335	98,759
Monthly Min.	62,285	65,591	69,936	56,628	59,960	61,223	68,580	70,377
Annual average Daily Flow (m ³ /day)	2,591	2,692	2,584	2,654	2,495	2,545	2,562	2,645
Max Daily Flow (m ³ /day)	4,518	4,434	4,286	4,490	4,087	4,087	3,733	4,656
Rated Capacity (m ³ /day)	6445	6445	6445	6445	6445	6445	6445	6445
% Max Day	70%	69%	67%	70%	63%	63%	58%	72%
Rated capacity % annual avg daily flow m ³ /day	40%	42%	40%	41%	39%	39%	40%	41%

Water Use Summary for 2010

	Cubic Meters	Litres
Water produced at the Water Treatment Plant	946,853.00	946,853,000.00
Customer Consumption	627,790.00	627,790,000.00
Bulk Water Consumption	6,917.00	6,917,000.00
Amount of water used for Hydrant flushing	9,003.00	9,003,000.00
Amount of water sold at Public Dispensing	37.60	37,600.00
Estimated amount of water used for flushing and swabbing of new watermains	620.80	620,800.00
Estimated amount of water used by Fire Department for practices and fires	12.00	12,000.00
Watermain and/or service connection leak	72,324.00	72,324,000.00
Chlorine Booster Station	35,800.00	35,800,000.00
Water Accounted For	752,504.40	752,504,400.00
Water Unaccounted For	194,348.60	194,348,600.00
Loss per day	532.46	532,461.92
Loss per hour	22.19	22,185.91
Loss per minute	0.3698	369.77
Loss per second	0.0062	6.16

Therefore approximately 20.5% of the total water supply remained unaccounted for in 2010; which is down approximately 4% from 2009.

$$\begin{aligned}
 \text{Total amount of water unaccounted for in 2010} &= 194,348.60 \text{ m}^3 \\
 \text{Divided by 1 year} &= \frac{365 \text{ days}}{\text{year}} \\
 \text{Per/day loss} &= 532.46 \text{ m}^3/\text{day} \\
 \text{Divided by hours/day} &= \frac{24 \text{ hours}}{\text{day}} \\
 \text{Loss per hour} &= 22.19 \text{ m}^3 / 60 \text{ minutes} = 0.3698 \text{ m}^3 \\
 0.3698 \text{ m}^3 &= 3698 \text{ L/m} / 60 \text{ seconds} = \underline{\underline{6.16 \text{ L/sec}}}
 \end{aligned}$$

In 2010, supervisory control and data acquisition (SCADA) flow to distribution trending indicated that flows drop down to 5-7 L/sec at low flow times during the night. This indicates that there is some unaccounted for water loss within the system. One piece of leak detection equipment was purchased in 2010, and a leak detection program will be developed in 2011; which may include the purchase of additional equipment that is able to detect leaks through the use of non-destructive testing.

2. ONTARIO DRINKING WATER SYSTEM REGULATIONS

2.1 THE SAFE DRINKING WATER ACT, 2002

The purpose of the Act is to gather in one place all legislation and regulations relating to the treatment and distribution of drinking water, to protect human health through the control and regulation of drinking water systems and drinking water testing. The new Drinking Water Systems Regulation and its supporting regulations can be found at ene.gov.on.ca. The Safe Drinking Water Act will be incorporating a statutory standard of care, whereby every director and officer of a corporation (including municipal councillors) that owns a municipal drinking water system has a duty to take all reasonable steps to prevent any user of the system from being exposed to an unreasonable health risk that may arise from their consumption of drinking water. With this, municipal officials are expected to be informed of their drinking water system and acquainted with drinking water legislation and regulations.

On May 14, 2004, the Ministry of the Environment filed a new certification regulation for operators of municipal and regulated non-municipal drinking water systems, titled *O.Reg. 128/04 Certification of Drinking Water System Operators and Water Quality Analysts* under the *Safe Drinking Water Act, 2002*: This new regulation ensures tougher certification and training rules for water system operators based on the classification of the Municipal Residential System. This regulation explains operating standards for Municipal Residential Subsystems and Limited Subsystems that are to be followed and maintained by the owner or operating authority of the subsystem including record-keeping re: operation of the subsystem, operation and maintenance manuals, operator training, and duties of the operator-in-charge.

2.2 THE DRINKING WATER PROTECTION REGULATION (O.Reg.170/03)

Effective June 1, 2003, the Drinking Water Protection Regulation (O.Reg. 170/03) replaced the Drinking Water Protection Regulation for larger Waterworks (O.Reg. 459/00). Regulation 170/03 sets water treatment standards for a variety of water systems and includes a number of supporting regulations, including the Drinking Water Quality Standards Regulation (O.Reg. 169/03) which prescribes standards for 161 physical/chemical, microbiological and radiological parameters.

2.3 SUSTAINABLE WATER AND SEWAGE SYSTEMS ACT, 2002

This Act ensures clean, safe drinking water for Ontario residents by making it mandatory for municipalities to assess and cost-recover the full amount of water and sewer services. A report to the Ministry on the full cost of water and wastewater services is to include a cost recovery plan for operating costs, source protection costs, financing costs, renewal and replacement costs and improvement costs associated with treating and distributing water to the public.

2.4 DEFINITIONS

Accredited Lab, all laboratories that test drinking water must be accredited for the tests they perform by the Standards Council of Canada or its equivalent. Accreditation involves performance testing and auditing to ensure that laboratories follow appropriate procedures using acceptable methods.

Chlorine Residual – chlorine residual in water is a component of chlorine after the initial disinfection or chlorine demand has been satisfied. The maintenance of a chlorine residual in the distribution system is intended to keep a persistent disinfectant residual to protect the water from microbiological re-contamination and serve as an indicator of distribution system integrity.

GUDI Groundwater Under Direct Influence of Surface Water – in some groundwater supplies, situations may exist where contaminants typically found on the ground or in surface water, such as a lake or river, find their way into the groundwater and can be pumped from the well into the water distribution system. Such a system is referred to as Groundwater Under Direct Influence of Surface Water or GUDI. This can be caused by a number of different factors including the geology surrounding a well, insufficient travel time between the well intake and surface water or a defect in the well. A true groundwater supply would normally be free of harmful microbiological contaminants and reflect only disinfection be provided as a minimum level of treatment along with a minimum chlorine residual after 15 minutes contact time.

MAC Maximum Acceptable Concentration – This is a health-related Ontario drinking water standard established for contaminants that have known or suspected adverse health effects when above a certain concentration. The length of time the MAC can be exceeded without injury to health will depend on the nature and concentration of the parameter.

IMAC Interim Maximum Acceptable Concentration – This is a health related Ontario drinking water standard established for contaminants when there are insufficient toxicological data to establish a MAC with reasonable certainty, or when it is not practical to establish a MAC at the desired level.

Inorganic parameters – substances such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production mining, farming, or domestic plumbing.

OG Operational Guidelines are established for parameters that need to be controlled to ensure efficient and effective treatment and distribution of water.

mg/L milligrams per litre is a measure of concentration of a parameter in water, sometimes called parts per million (ppm).

µg/L micrograms per litre is a measure of concentration of a parameter in water, sometimes called parts per billion (ppb).

Parameter is a substance that is sampled and analyzed in the water.

Municipality of Brighton 2010 Annual Report on Drinking Water Quality

Potable Water is water from ground or surface sources that is supplied for human consumption.

Raw Water – water entering the treatment plant prior to any chemical addition. Raw water sampling and analysis provides a measure of source water quality which allows assessment and adjustment of treatment process; information on the source of any contaminants; and long term trends in source water quality.

Total Trihalomethanes (THM) – are the most widely occurring synthetic organics found in chlorinated drinking water. The principal source of Trihalomethanes is the action of chlorine with naturally occurring organics (material that comes from plant or animal sources). The maximum acceptable concentration for THM is 0.10 mg/L based on four quarter moving annual average test results, tested at a remote point site in the distribution system.

Turbidity – turbidity in water is caused by the presence of suspended matter such as clay, silt and microscopic organisms and is commonly present in the source water as a result of soil runoff. The substances and particles that cause turbidity can be responsible for interference with disinfection, can be a source of disease-causing organisms, and can shield pathogenic organisms from the disinfection process.

Treated Water is source water that has been altered in order to disinfect and ensure treatment has producing water of equal or better quality.

3 REQUIREMENTS OF THE DRINKING WATER SYSTEM REGULATION

3.1 Sample & Test drinking water in a frequency designed to reflect the type and user of the system. Specific requirements for each category differ depending on the size and population served.

- Category of System - Brighton Well Supply is categorized as **Large Municipal Residential**, which is defined as a municipal drinking water system that serves a major residential development of more than 100 private residences.
- Sampling & Testing requirements for a Large Municipal Residential drinking water system state that the owner of the drinking-water system and the operating authority for the system shall ensure samples be tested for the following:
 - Microbiological – O.Reg. 170/03 Schedule 10 requires at least eight distribution samples, plus one additional distribution sample for every 1,000 people served by the system, are taken every month, with at least one of the samples being taken each week. With this, 13 treated distribution samples would be required monthly. Brighton currently samples at least 7 distribution samples weekly or approximately 28 samples monthly, and 1 treated water sample weekly. These samples are tested for Escherichia coli or fecal coliforms and total coliforms, and 25% of the samples are tested for general bacteria populations expressed as background colony counts on the total coliform membrane filter or as colony counts on a heterotrophic plate count. Raw water samples are required to be tested at least once every week from the drinking-water system's raw water before any treatment is applied to the water. Raw water was sampled weekly from Well #1, Well #2 and Well #3.

Table 2 - 2010 Microbiological Sampling & Testing-Large Municipal Residential

Source	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Well #1	4	4	5	4	4	5	4	5	4	4	5	4	52
Well #2	4	4	5	4	4	5	4	5	4	4	5	4	52
Well #3	4	4	5	4	4	5	4	5	4	4	5	4	52
Total Raw Samples	12	12	15	12	12	15	12	15	12	12	15	12	156

Treated Water POE (Point of Entry)	4	4	5	4	4	5	4	5	4	4	5	4	52
Distribution System	28	28	35	28	28	35	28	35	28	28	35	28	364
Total Treated Samples	32	32	40	32	32	40	32	40	32	32	40	32	416

Microbiological Results	Number of Samples	Range of E.Coli Results	Range of Total Coliform Results	Number of HPC Samples	Range of HPC Results
Raw	156	<1	<1	0	0
Treated Water POE-Treatment Plant	52	Absent	Absent	52	<10 - 30
Distribution	364	Absent	Absent	104	<10 - 310

Municipality of Brighton 2010 Annual Report on Drinking Water Quality

Lead Samples - Spring

Sample Type	# of Samples	Pass	Fail	Resamples Pass/Fail
Plumbing – Residential	40	39	1	Pass
Plumbing – Non-Residential	5	5	-	-
Distribution	8	7	1	Pass
Total Samples	53	51	2	Pass

Lead Samples - Fall

Sample Type	# of Samples	Pass	Fail	Resamples Pass/Fail
Plumbing – Residential	0	-	-	-
Plumbing – Non-Residential	0	-	-	-
Distribution	8	8	-	-
Total Samples	8	8	-	-

*Note: Fall plumbing exempt from lead sampling due to MOE approval for reduced sampling (see below).

In 2010, the Water Department applied for a lead sampling reduction based on provisions set out in O. Reg. 170/03 which allows Operating Authorities to apply for reduction if they meet certain criteria with respect to satisfactory historical sampling results. Supported by the Health Unit, Brighton was successful in this application and is therefore not required to conduct residential and non-residential lead sampling until Fall of 2012. It is important to note, however, that distribution sampling is still required as per O. Reg. 170/03.

Chemical Sampling & Testing – O.Reg. 170/03 Schedule 13 requires Large Municipal Residential Systems be tested for the following:

- (i) Inorganics (Schedule 23) be tested at least every 12 months if the system obtains water from a raw water supply that is surface water. Note that once the water system switches to groundwater (wells) then sampling for organic/inorganic parameters can be reduced to every 36 months.
- (ii) Lead - at least one sample in the distribution system is taken every 12 months from a point in the drinking-water system's distribution system or in plumbing that is connected to the drinking-water system that is likely to have an elevated concentration of lead. In 2007 new Regulations were added to test for Lead - Schedule 15.1-5. Sampling is to be conducted from December 15th to April 15th in the spring, and June 15th to October 15th in the fall in various locations. This constitutes 52 samples for each reporting period; unless the Operating Authority has applied for and received a reduction.
- (iii) Organics – if the system obtains water from a raw water supply that is surface water, at least one water sample is taken every 12 months. When the raw water source is groundwater (wells) then at least one water sample must be taken every 36 months.

- (iv) Trihalomethanes – at least one distribution sample is taken every three months from a point in the drinking-water system that is likely to have an elevated potential for the formation of Trihalomethanes.
- (v) Nitrate and Nitrite, one water sample taken every three months.
- (vi) Sodium, one water sample taken every 60 months.
- (vii) Fluoride, one water sample taken every 60 months.

See **Appendix I** – Part III Form 2 for Brighton’s Annual Report electronic submission to MOE; there were no exceedances of organic or inorganic parameters tested during this period.

3.2 Use an Accredited Laboratory

Drinking water systems must use a licensed laboratory as outlined in the Drinking Water Testing Services Regulation (O.Reg.248/03) which became law in June 2003.

- Laboratory Services Notification Forms O.Reg. 170/03 were completed and submitted to the Ministry of Environment. Confirmation that Caduceon Laboratories in Kingston, Nepean, and Ottawa as well as Lakefield Research are listed with The Standards Council of Canada as an accredited lab was made. Notifications were sent to the labs to ensure clear and complete notification is reported when adverse water quality incidents may be reported.

3.3 Report adverse test results

Any test result that exceeds any of the standards in Schedules 1, 2, 3 (other than fluoride) in the Ontario Drinking Water Quality Standards (O.Reg.169/03) must be reported verbally and in writing to both the local Medical Officer of Health and the Ministry of the Environment Spills Action.

3.4 Obtain a Certificate of Approval and a Permit to Take Water for a municipal residential drinking water system from the ministry.

The approvals process is currently in a transitional phase and will be replaced with a new process under the Drinking Water Quality Management Standard (DWQMS).

DWQMS was created following the Walkerton Inquiry, wherein the Honourable Justice Dennis R. O’Connor released a report recommending new approval requirements for municipal drinking water systems. Accordingly, the Government of Ontario initiated the Municipal Drinking Water Licensing Program. This program requires that owners meet several key elements in order to obtain a new license. These elements include:

- A permit to take water
- A municipal drinking water licence (replacing the existing Certificate of Approval)
- A drinking water works permit (replacing the existing Certificate of Approval)
- An accredited operational plan
- An approved financial plan
- Successful completion of internal audits
- Successful completion of external audits

Municipality of Brighton 2010 Annual Report on Drinking Water Quality

The Municipal Drinking Water Licensing Program focuses on incorporating quality management into municipal water administration and operations; and is comparable to ISO (International Organization for Standardization) accreditation in the private sector. Another key aspect of the program is its emphasis on Continual Improvement.

In 2009, Brighton finalized its operational plan and submitted to both the Ministry of the Environment and the Canadian General Standards Board for a systems audit. Upon successful completion of the audit, Brighton will become an accredited operating authority and will make the transition from operating under a Certificate of Approval to operating under a Municipal Drinking Water System License and a Drinking Water Works Permit.

In 2010, Brighton received its Municipal Drinking Water System License and Drinking Water Works Permit, as well as *Limited Scope Entire DWQMS* accreditation. Following an Internal Audit conducted in August and September 2010; and the initiation of a Rates Study and Financial plan per O. Reg. 453/07, the Municipality will be ready to apply for *Full Scope Entire DWQMS* accreditation in 2011.

Brighton Water Well Supply System's Approvals include:

- 1) Permit to Take Water No. 2001-62MNU2 was issued to the municipality on September 27, 2004 and authorizes the withdrawal of water from each of the production wells as follows:

Well No. 1 24.9 L/s, 1,494 L/min or 2,151,360 L/day

Well No. 2 24.9 L/s, 1,494 L/min or 2,151,360 L/day

Well No. 3 24.9 L/s, 1,494 L/min or 2,151,360 L/day

- 2) Certificate of Approval Number PB220000807RR-0, dated the 4th day of June, 2010. Which was subsequently replaced by:
- 3) Municipal Drinking Water Licence # 135-101 issue number 1.
- 4) Drinking Water Works Permit # 135-201 issue number 1.

3.5 Have certified operators or trained persons, depending on category of system.

Certified Operators include:

Mike Ryckman, Overall Responsible Operator, Supervisor, WDS III

Mark Alexander, WDS II

Steve Wong, WDS II

Operator training requirements, under O. Reg. 128/04 state that the annual number of hours of training required under Section 29 in each year will be a total of 40 hours of which 14 hours or more are continuing education and the remaining hours as on-the-job practical training.

3.6 Prepare an annual report in order that the public has access to information on the status of drinking water.

Annual reports are prepared in accordance with O.Reg.170/03. Drinking water reports are available at both municipal offices and the municipal website; the public is informed via newspaper when it is available. The Annual Report on Drinking Water must be passed by Resolution of Council.

3.7 Prepare an Annual Summary Report, on municipal residential systems for municipal Councillors, members of a municipal service board, or the board of directors of municipal business corporations, as appropriate.

This report must include information regarding the requirements of the Act (Section 3.1 of this report), the regulations (Section 2), the System's approval (Section 3.4) and any order that the system failed to meet during the period of the report noting the duration of the failure and the measures taken to correct the failure. The report must also include flow rates of the water supplied during the period including monthly average, maximum daily flows, and the rated capacity for the purpose of assessing the capability of the system (Table 1), and daily instantaneous peak flow rates (Appendix III). The report must include information for the purpose of enabling the owner of the system to assess the capability of the system to meet existing and future planned uses of the system.

3.8 MOE Annual Inspection Report Non-Compliance Finding

Please see Appendix 3 for complete details.

4 UPGRADES TO THE DRINKING WATER SYSTEM TO CORRECT DEFICIENCIES

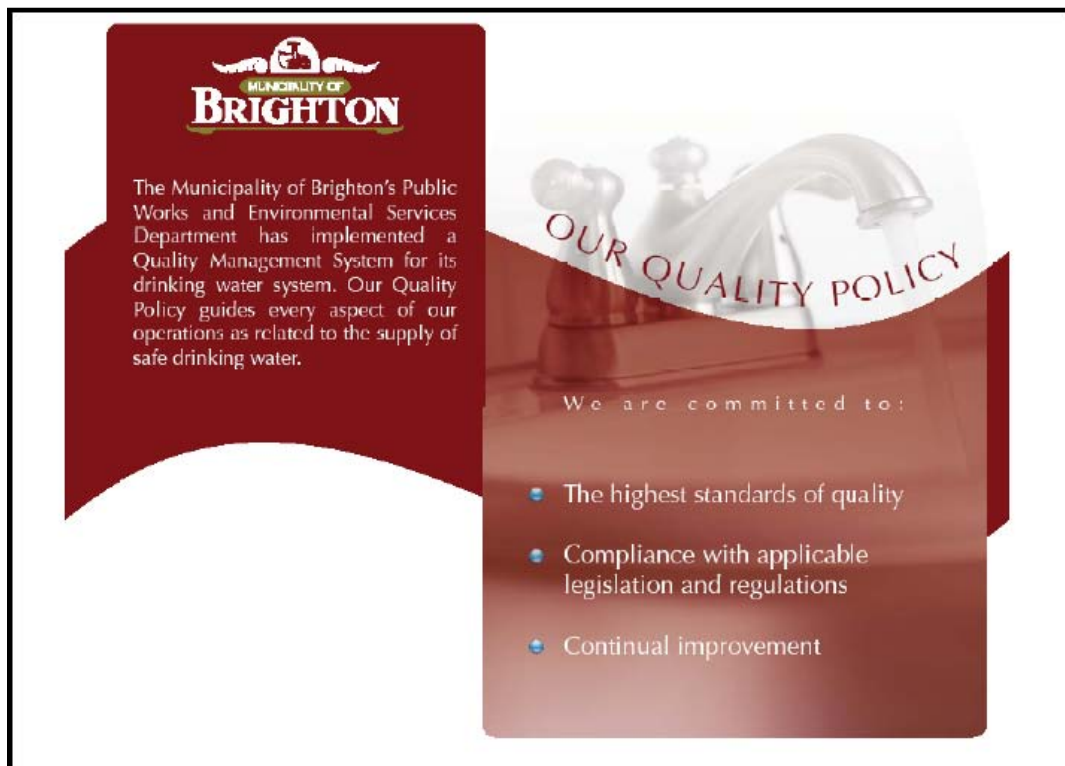
No upgrades were needed to the Brighton Well Supply or Treatment Plant Facility to maintain compliance with the regulations and standards set forth by the Ministry of the Environment.

5 CONCLUSION

In 2010, the Brighton Well Supply and Distribution System applied for and received a Reduction in Lead Testing Sampling requirements; was issued both a Municipal Drinking Water Licence and a Drinking Water Works Permit. In the effort to reduce unaccounted for water loss, one piece of leak detection equipment was purchased, with plans to develop and implement a leak detection program in 2011. Additionally, DWQMS internal auditing was conducted, and we look forward external audits and achieving full scope accreditation 2011.

The Municipality of Brighton's Quality Policy

The Municipality of Brighton is committed to providing safe and reliable drinking water that is compliant with the Safe Drinking Water Act and applicable regulations and legislation. We will promote an effective Quality Management System to ensure quality and consistency in all operations associated with the Drinking Water System. We will continuously review, maintain and improve our Quality Management System.



Appendix 1 - 2010 Monthly Summary

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	ANNUAL
<u>FLOW</u>													
TOTAL FLOWS (m ³)	70,251.00	62,284.50	66,588.10	72,462.00	99,693.40	86,520.60	99,838.30	99,290.50	80,516.70	72,963.20	65,236.90	71,208.30	946,854
DAILY AVG. FLOW (m ³)	2,266.16	2,224.45	2,148.00	2,415.40	3,215.92	2,884.02	3,220.59	3,202.92	2,683.89	2,353.65	2,174.56	2,297.04	2,591
MAXIMUM DAILY FLOW (m ³)	2,408.04	2,443.28	2,295.73	3,065.44	4,517.63	3,592.90	4,009.09	3,759.09	3,634.55	2,685.99	2,321.60	2,441.77	2,296
MINIMUM DAILY FLOW (m ³)	2,180.38	2,140.09	2,040.86	2,173.16	2,429.99	2,557.48	2,627.98	2,517.75	2,349.98	2,155.19	2,053.19	2,211.04	2,557
<u>CHLORINE CONSUMPTION</u>													
TOTAL USED (kg)	80.50	69.10	72.90	83.90	123.60	99.70	118.40	104.40	89.20	77.60	72.30	75.50	1,067.10
DAILY AVERAGE (kg)	2.60	2.40	2.40	2.60	4.00	3.30	3.80	3.40	3.00	2.50	2.40	2.40	2.92
AVERAGE Pre-DAILY DOSAGE (mg/L)	1.12	1.04	1.04	1.13	1.21	1.13	1.12	1.02	1.07	1.04	1.08	1.03	1.09
<u>TURBIDITY (NTU) post</u>													
MONTHLY AVERAGE	0.06	0.06	0.07	0.07	0.080	0.080	0.07	0.06	0.07	0.07	0.09	0.08	0.072
RANGE	0.06-0.07	0.06-0.08	0.06-0.20	0.06-2.00	0.08-0.13	0.07-0.19	0.06-0.09	0.06-0.08	0.06-0.11	0.06-0.12	0.08-0.15	0.08-0.10	---
<u>pH Outlet</u>													
MONTHLY AVERAGE	7.44	7.42	7.93	7.49	7.33	7.36	7.43	7.43	7.43	7.43	7.41	7.34	7.45
<u>TEMPERATURE (°C) Outlet</u>													
MONTHLY AVERAGE	9.88	9.80	9.83	10.02	10.29	10.37	10.43	10.35	10.31	10.18	9.93	9.86	10.10

Appendix 2

Drinking-System Regulations O.Reg. 170/03

Part III Form 2

Section 11. ANNUAL REPORT.

Drinking-Water System Number:	220000807
Drinking-Water System Name:	Brighton Well Supply
Drinking-Water System Owner:	Corporation of the Municipality of Brighton
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1 – December 31, 2010

<p><u>if your Category is Large Municipal Residential or Small Municipal Residential</u></p> <p>Does your Drinking-Water System serve more than 10,000 people? Yes [] No [x]</p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes [x] No []</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Municipal Offices: 35 Alice St., Brighton 67 Sharp Rd. Brighton</p> </div>	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served: <input style="width: 100px; height: 20px;" type="text"/></p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [] No []</p> <p>Number of Interested Authorities you report to: <input style="width: 100px; height: 20px;" type="text"/></p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [] No []</p>
---	--

Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

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

Drinking Water System Name	Drinking Water System Number
Presqu'ile Provincial Park- Parks Ontario	

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

Yes [x] No []

Municipality of Brighton 2010 Annual Report on Drinking Water Quality

Indicate how you notified system users that your annual report is available, and is free of charge.

Public access/notice via the web

Public access/notice via Government Office

Public access/notice via a newspaper

Public access/notice via Public Request

Public access/notice via a Public Library

Public access/notice via other method _____

Describe your Drinking-Water System

In 2010, water sources at the Brighton Well Supply consisted of three drilled wells. The only raw water source is groundwater which is captured from a deep aquifer by drilled wells located adjacent to the old Upper Reservoir site. There are three wells that draw water from the aquifer under the reservoir area: Well Nos. 1, 2 and 3 pumps work on rotation. A fail safe control system has been installed to ensure that an upward hydraulic gradient is maintained at all times in the raw water supply aquifer. This system includes water level sensors in each observation and production well, an alarm system equipped with pre-determined set-points for well depth, and a SCADA data-log system. The work was completed and commissioned in October, 2005.

Disinfection of water to eliminate disease causing organisms is the most important step in the water treatment process. In October 2005 our upgraded system came on-line which changed our system from an open surface water reservoir system to an enclosed concrete storage reservoir. This enables us to have more contact time for chlorination, which is done by injecting Chlorine gas into the water as it enters into one of two cells (*which is called Pre-Chlorination*). The concrete water storage reservoir is approximately 39 m x 58 m, and consists of two cells. Each cell is equipped with baffles and provides $2800 \text{ m}^3 \times 2 = 5600 \text{ m}^3$ of water storage and equipped with overflow, drain system, piping and appurtenances, and a water main from the **Water Treatment Plant** (WTP) and reservoir to the existing distribution system (DS). A WTP building approximately 39 m x 10 m housing a primary and secondary disinfection system consisting of two (2) gas chlorinators, weigh scales, vacuum regulators, injectors and appurtenances to facilitate application of chlorine solution for pre-chlorination at a point where water enters either cell from the wells and also post-chlorination as water enters the DS. Instrumentation and controls including on-line chlorine residual analyzer and turbidity meters measure the chlorine residuals and turbidity in the reservoirs and the outlet to the DS. Emergency power is provided by an 80 kW pad mounted standby generator including automatic transfer switch. There is a drain/bypass line from the WTP and reservoirs to outfall through a bypass detention pond. The Brighton Well Supply is classified as Water Distribution and Supply Class III.

List all water treatment chemicals used over this reporting period

Chlorine Gas

Were any significant expenses incurred to?

Install required equipment

Repair required equipment

Municipality of Brighton 2010 Annual Report on Drinking Water Quality

[] Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred

Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

Microbiological Results	Number of Samples	Range of E.Coli Results	Range of Total Coliform Results	Number of HPC Samples	Range of HPC Results
Raw	156	<1	<1	0	0
Treated Water POE-Treatment Plant	52	Absent	Absent	52	<10 - 30
Distribution	364	Absent	Absent	104	<10 - 310

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

	Number of Grab Samples	Range of Results (min #)-(max #)
Turbidity	8760	0.00-2.00 ntu's
Chlorine	8760	0.69-4.05 mg/L
Fluoride (If the DWS provides fluoridation)		

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

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

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

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure

Municipality of Brighton 2010 Annual Report on Drinking Water Quality

Summary of Inorganic parameters tested during this reporting period or the most recent sample results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedances
Arsenic	Nov 25/08	<0.0001	mg/L	No
Barium	Nov 25/08	0.062	mg/L	No
Boron	Nov 25/08	<0.005	mg/L	No
Cadmium	Nov 25/08	<0.00002	mg/L	No
Chromium	Nov 25/08	<0.002	mg/l	No
*Lead				
Mercury	Nov 25/08	<0.00002	mg/L	No
Selenium	Nov 25/08	0.0025	mg/L	No
Sodium	Nov 13/07	0.0006	mg/L	No
Uranium	Nov 25/08	0.00052	mg/l	No
Fluoride	Nov 13/07	<0.1	mg/L	No
Nitrite	Nov 9/10	<0.1	mg/L	No
Nitrate	Nov 9/10	2.7	mg/L	No
Nitrate + Nitrite	Nov 9/10	2.7	mg/L	No

*only for drinking water systems testing under Schedule 15.2; this includes large municipal non-residential systems, small municipal non-residential systems, non-municipal seasonal residential systems, large non-municipal non-residential systems, and small non-municipal non-residential systems.

Summary of lead testing under Schedule 15.1 during this reporting period
(Applicable to the following drinking water systems; large municipal residential systems, small Municipal residential systems and non-municipal year-round residential systems)

Location Type	Number of Samples	Range of Lead Results (min#) – (max #)	Number of Exceedances
Plumbing	45	0.00022 – 0.0236	1
Distribution	16	0.00003 – 0.0112	1

Summary of Organic parameters sampled during this reporting period or the most recent sample results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedances
Alachlor	28 Nov/08	<0.3	µg/L	No
Aldicarb	28 Nov/08	<3	µg/L	No
Aldrin + Dieldrin	27 Nov/08	<0.02	µg/L	No
Atrazine + metabolites	28 Nov/08	<0.5	µg/L	No
Azinphos-methyl	28 Nov/08	<1	µg/L	No
Bendiocarb	28 Nov/08	<3	µg/L	No
Benzene	27 Nov/08	<0.5	µg/L	No
Benzo(a)pyrene	28 Nov/08	<0.005	µg/L	No
Bromoxynil	28 Nov/08	<0.3	µg/L	No
Carbaryl	28 Nov/08	<3	µg/L	No
Carbofuran	28 Nov/08	<1	µg/L	No
Carbon Tetrachloride	27 Nov/08	<0.2	µg/L	No

Municipality of Brighton 2010 Annual Report on Drinking Water Quality

Chlordane (Total)	27 Nov/08	<0.04	µg/L	No
Chlorpyrifos	28 Nov/08	<0.5	µg/L	No
Cyanazine	28 Nov/08	<0.5	µg/L	No
Diazinon	28 Nov/08	<1	µg/L	No
Dicamba	28 Nov/08	<5	µg/L	No
1,2-Dichlorobenzene	27 Nov/08	<0.1	µg/L	No
1,4-Dichlorobenzene	27 Nov/08	<0.2	µg/L	No
Dichlorodiphenyltrichloroethane (DDT) + metabolites	27 Nov/08	<0.1	µg/L	No
1,2-Dichloroethane	27 Nov/08	<0.1	µg/L	No
1,1-Dichloroethylene (vinylidene chloride)	27 Nov/08	<0.1	µg/L	No
Dichloromethane	27 Nov/08	<0.3	µg/L	No
2-4 Dichlorophenol	28 Nov/08	<0.1	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	28 Nov/08	<5	µg/L	No
Diclofop-methyl	28 Nov/08	<0.5	µg/L	No
Dimethoate	28 Nov/08	<1	µg/L	No
Dinoseb	28 Nov/08	<0.5	µg/L	No
Diquat	2 Dec/08	<5	µg/L	No
Diuron	28 Nov/08	<5	µg/L	No
Glyphosate	2 Dec/08	<25	µg/L	No
Heptachlor + Heptachlor Epoxide	27 Nov/08	<0.1	µg/L	No
Linadane (Total)	27 Nov/08	<0.1	µg/L	No
Malathion	28 Nov/08	<5	µg/L	No
Methoxychlor	27 Nov/08	<0.1	µg/L	No
Metolachlor	28 Nov/08	<3	µg/L	No
Metribuzin	28 Nov/08	<3	µg/L	No
Monochlorobenzene	27 Nov/08	<0.2	µg/L	No
Paraquat	2 Dec/08	<1	µg/L	No
Parathion	28 Nov/08	<3	µg/L	No
Pentachlorophenol	28 Nov/08	<0.1	µg/L	No
Phorate	28 Nov/08	<0.3	µg/L	No
Picloram	28 Nov/08	<5	µg/L	No
Polychlorinated Biphenyls(PCB)	27 Nov/08	<0.05	µg/L	No
Promethyne	28 Nov/08	<0.1	µg/L	No
Simazine	28 Nov/08	<0.5	µg/L	No
THM (NOTE: show latest annual average)	11/9/10 8/10/10 5/18/10 2/9/10	Annual Average 0.0033	mg/l	No
Sodium	20 Nov//07	4.9	mg/L	No
Nitrate+Nitrite	26 Nov/08	2.9	mg/L	No
Bromochloromethane	27 Nov/08	1.4	µg/L	No
Temephos	28 Nov/08	<10	µg/L	No
Terbufos	28 Nov/08	<0.3	µg/L	No
Tetrachloroethylene	27 Nov/08	<0.2	µg/L	No
2,3,4,6-Tetrachlorophenol	28 Nov/08	<0.1	µg/L	No
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	28 Nov/08	<10	µg/L	No
Trifluralin	28 Nov/08	<0.5	µg/L	No

Municipality of Brighton 2010 Annual Report on Drinking Water Quality

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Result Value	Unit of Measure	Date of Sample

Appendix 3



NON-COMPLIANCE WITH REGULATORY REQUIREMENTS AND ACTIONS REQUIRED

This section provides a summary of all non-compliance with regulatory requirements identified during the inspection period, as well as actions required to address these issues. Further details pertaining to these items can be found in the body of the inspection report.

1. The owner was not in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the Permit, Licence or Approval issued under Part V of the SDWA.

The DWS experienced several flow exceedances of Permit To Take Water # 2001-62MNU2, condition #3.2 - Table "A", flow rate of 1494 L/minute.

Action(s) Required:

Following the identification of the PTTW flow exceedances, the Corporation of the Municipality of Brighton, implemented a "Standard Operating Procedure" (S.O.P.) developed to provide notification to the Overall Responsible Operator (O.R.O.), the Director, and the Ministry of the Environment, at preset exceedance durations, by the Operator-in-Charge (O.I.C.). The S.O.P. also indicates that the Operator-in-Charge will investigate the root causes of the flow exceedances and take all necessary actions to correct the issue. Further, the S.O.P. entitled "Well Pump Flow Exceedance" tags the flow exceedances as Classes 1 through 4, as follows;

Class 1 Exceedance = An exceedance of less than 5 minutes

Class 2 Exceedance = An exceedance of greater than 5 minutes

Class 3 Exceedance = An exceedance of greater than 20 minutes

Class 4 Exceedance = An exceedance of greater than 60 minutes

Additionally, a Class 1 exceedance requires the data to be recorded on a Flow Exceedance Chart and be documented in the daily log book; a Class 2 flow exceedance requires the O.I.C. to notify the "O.R.O.", and documented as above; a Class 3 flow exceedance requires the "Director" to be notified and be documented, and lastly a Class 4 flow exceedance requires that the "Ministry of The Environment" be notified and be documented as above.

No further Actions Required at this time.

Appendix 4

Small Municipal Non-Residential Systems Annual Report

In addition to the Large Municipal Drinking Water System under *Ontario Regulation 170/03*, the Municipality of Brighton is also responsible for three Small Municipal Non-Residential Systems, as defined in *Ontario Regulation 318/08*. These facilities include the Codrington Hall, Hilton Hall and the North Fire Hall. All three are categorized as Small Municipal Non-Residential; which is defined as a municipal drinking water system that does not serve a residential development, is not capable of supplying drinking water at a rate of more than 2.9 Litres per second, and serves a designated facility or public facility.

On September 10th, 2008, *Ontario Regulation 318/08* was introduced for Small Municipal Non-Residential systems, which includes rural community halls such as Codrington Hall, Hilton Hall and the North Fire Hall. The new regulation reduces the financial burden on owners but maintains a high level of public health protection. Only microbiological sampling of *E. Coli* and *Total Coliforms* is required.

Codrington Hall Well Supply

Microbiological sampling is conducted bi-weekly at the Codrington Hall. The water system at this location consists of UV disinfection and filtration. A total of 26 samples were taken at this location in 2010, with no adverse results.

Hilton Hall Well Supply

Microbiological sampling is conducted bi-weekly at Hilton Hall. The water system at this location consists of UV disinfection and filtration. A total of 26 samples were taken at this location in 2010, with no adverse results.

North Fire Hall Well Supply

Beginning in June 2010, bi-weekly microbiological sampling was initiated at the North Fire Hall, as required by the Ministry of Health. The water system at this location consists of UV disinfection and filtration. A total of 15 samples were taken at this location in 2010, with no adverse results.