CITY OF CHARLOTTETOWN
WATER & SEWER UTILITY

WATER REPORT 2005

COMMITTEE MEMBERS
Philip D. Brown, Chair
Cecil F. Villard, Vice-Chair
Mitchell G. Tweel

Craig R. Walker, Manager

Prince Edward Island is fortunate in that it depends on groundwater for its drinking water. The City of Charlottetown provides its residents with water from three main wellfields (Brackley, Suffolk, and Union) and two small systems (Brookdale and Hunter Green). A backup station is situated at Malpeque and is operated on an "as required" basis only. In 2005, approximately 6,692,561 M^3 (1.47 Billion Imperial Gallons) of water was delivered to its customers.

Brackley, Union and Suffolk are disinfected with chlorine whereas the small systems are not. The small system at Hunter Green provides disinfection by ultraviolet lights and a water softener has been put in place to minimize barium content. Brookdale is monitored on a regular basis and no disinfection or treatment has been required; however, a disinfection system is in place and can be operated as necessary.

Based on the results of a plebiscite in the mid 1960's, fluoride was introduced to the three main wellfields. A level of .8 mg/L is the current target.

SAMPLING (Coliform, E.coli, Background):
In accordance with the provincial government's *Drinking Water and Wastewater Facility Operating Regulations*, samples are collected on a monthly basis and analyzed for the presence of coliform bacteria and E.coli. These samples are taken to an accredited laboratory (PEI Analytical Laboratories) for analysis and reports are prepared.

By testing for the presence of coliform bacteria within the distribution system, it confirms the effectiveness of the disinfection process. Total coliforms do not necessarily indicate the presence of faecal contamination. According to the *Guidelines for Canadian Drinking Water Quality*, the maximum acceptable concentration (MAC) for coliforms is zero per 100mL. Because coliforms are not uniformly distributed in water, there are conditions provided for compliance consideration eg "no sample should contain more than 10 total coliform organisms per 100mL, none of which should be faecal coliforms". Utility staff is quick to inspect and resample a site when samples are non-compliant (total count >10).

Total Coliform Bacteria (Distribution System)

	# of Samples	Positive TC Tests	# of Non-Compliant Samples (TC>10)
January	54		
February	35	1	1
March	36		
April	23		
May	32		
June	32	1	1
July	33	3	
August	33	2	1
September	32	1	
October	38	3	1
November	33	1	1
December	32		1
Total	413	12*	6*
Detection %		0.029	0.015

* All re-tests reported negative

The presence of E.coli bacteria indicates that the water may be contaminated with human or animal waste. The presence of this contamination is what caused the "boil water" advisories in the past. In 2005, no samples in the distribution system had a positive result. There were some positive results in the supply system and the respective wells were taken out of service until negative results were obtained.

At the time the sample is analyzed, the lab estimates the general bacterial population from background colony counts. These counts are an indicator of the system's condition and a count of >200 should be resampled. Utility staff resamples all sites with a >200 count. As part of the regular maintenance, hydrant flushing is done twice a year and this helps ensure clean clear water.

Total Background Growth

	# of Samples	Positive BG Tests	# of Non-Compliant Samples (BG>200)
January	54	1	
February	35	5	
March	36	2	
April	23		1
May	32		
June	32	1	1
July	33	3	1
August	33	1	1
September	32	2	
October	38	2	
November	33	1	1
December	32	1	1
Total	413	19**	6*
Detection %		0.046	0.015

* All re-tests reported negative
** All re-tests reported negative. One sample with a count of 1 was not re-tested.

SAMPLING (Chemical):
In accordance with the provincial regulations, the Utility is required to collect a minimum of one sample per year from each source of supply to be analyzed for a general chemical analysis. The Utility collects a minimum of two samples per year. The MAC was within the *Guidelines for Canadian Water Quality* with the exception of Hunter Green Station where the barium count was high. Sample taken after the water softener was within the guidelines.

`UNTREATED WATER (SAMPLES FROM WELLS)

	Distribution (Small Systems)	Brookdale/ Green Meadow	Malpeque	Brackley	Union	Suffolk	Total	TC	>10 TC	Ecoli	BG	>200 BG
January	3	6		2	6	6	23	8			1	
February	2	3		4		4	13	3		1	1	
March	2	3		6	10	4	25	9	2	1	5	
April			1	2			3	2	1		3	
May	2	3		4	5	4	18	2				
June	2	3		4	5	4	18	1			2	
July	2	3		4	5	4	18	3			2	
August	5	7	1	6	10	4	33	8	2		8	
September	1	2		4	5	4	16	3			4	
October	3	4	1	8	10	8	34	11	6	2***	7	
November			1	2			3		3	2		
December	2	3		4	5	4	18	7	2	1	2	
Total	24	37	4	50	61	46	222	57	16	7	35	

***Wells were temporarily taken out of service

During the course of the year, samples for chemical analysis are taken from the distribution system. Based on the information gathered, the following is a typical chemical analysis of the water the City of Charlottetown provides its customers.

Typical Chemical Analysis

Chemical	Concentration, (mg/l)
Alkalinity Total	131.7
Cadmium	< 0.005
Calcium	28.2
Chloride	13.7
Chromium	< 0.05
Copper	<0.02
Iron	< 0.1
Lead	<0.002
Magnesium	16.0
Manganese	< 0.020
Nickel	< 0.05
Nitrate-N	3.1
pH	7.8
Phosphorus	<0.02
Potassium	1.45
Sodium	7.08
Sulfate	6.5
Zinc	<0.02
Total Hardness	148

A maximum acceptable concentration (MAC) for hardness in drinking water has not been established; however, a hardness of >200 mg/L is considered poor. (*Guidelines for Canadian Drinking Water Quality*)

WATER SUPPLY:

1888 – Malpeque Pumping Station was built supplying water for fire protection and to some homes

1930 – Brackley Pumping Station was built (Winter River Watershed)

1949 – Union Pumping Station was developed (Winter River Watershed)

1994 – Suffolk Pumping Station was established (Winter River Watershed)

1997 – Brookdale Pumping Station was developed

2000 – Hunter Green Pumping Station was built

WINTER RIVER WATERSHED
Source: Dept of Environment, Energy and Forestry

The Utility strives to provide high quality drinking water to its customers. This report provides you, the customer, with some of the progress of its efforts.