

Drinking Water Quality and Compliance 2007 Annual Notice to Consumers

Saskatchewan Environment requires that at least once each year waterworks owners provide notification to consumers of the quality of water produced and supplied as well as information on the performance of the waterworks in submitting samples as required by a Minister's Order or Permit to Operate a waterworks. The following is a summary of **PRINCE ALBERT**'s water quality and sample submission compliance record for the year of 2007. Readers should refer to Saskatchewan Environment's "Municipal Drinking Water Quality Monitoring Guidelines, November 2002, EPB 202" for more information on minimum sample submission guidelines. If consumers need more information on the nature and significance of specific water tests, for example, "what is the significance of Arsenic in a water supply", more detailed information is available from: www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/index_e.html

Water Quality Standards

Bacteriological Quality

Parameter/Location	Limit	Regular Samples Required	Regular Samples Submitted	# of Positive Regular Submitted (Percentage %)
Total Coliform and Background Bacteria	0 organisms/100 mL	520	586	0
	Less than 200 organisms/100 mL	520	586	0

The owner/operator is responsible to ensure that one hundred percent of all bacteriological samples are submitted as required. All waterworks are required to submit samples for bacteriological water quality; the frequency of monitoring depends on the population served by the waterworks. None of the 586 samples submitted tested positive for either Total or Fecal coliforms.

Water Disinfection – Chlorine Residual for Test Results Submitted with Bacteriological Samples

Parameter	Minimum Limit (mg/L)	Free Chlorine Residual Range (mg/L)	Total Chlorine Residual Range (mg/L)	# Tests Required	# Tests Submitted	# Adequate Chlorine (%)
Chlorine Residual in Distribution System	0.1 mg/L free OR 0.5 mg/L total	0.10 – 2.18	0.52 - 2.18	520	586	100

*A minimum of 0.1 milligrams per litre (mg/L) free chlorine residual **OR** 0.5 mg/L total chlorine residual is required at all times throughout the distribution system unless otherwise approved. Please note that for this annual report, an adequate chlorine submission is defined as a bacteriological sample submission with both free and total chlorine residuals filled out and those chlorine residual levels being above the minimum regulated levels described above. A waterworks is required to submit chlorine residual test results on every bacteriological sample they submit.*

Water Disinfection – Free Chlorine Residual for Water Entering Distribution System – From Water Treatment Plant Records

Parameter	Limit (mg/L)	Test Level Range (mg/L)	# Tests Performed	# Test Not Meeting Requirements
Free Chlorine Residual leaving the Water Treatment Plant	at least 0.1	0.96 – 2.77	4,380	0

A minimum of 0.1 milligrams per litre (mg/L) free chlorine residual is required for water entering the distribution system. The City of Prince Albert WaterWorks Permit state that the Free Chlorine entering the distribution system must be sampled once per day. In Prince Albert, grab sample tests are performed every two hours by the water plant operators and are recorded in operation records. This data includes the number of free chlorine residual tests performed, the overall range of free chlorine residual (highest and lowest recorded values) and the number of tests and percentage of results not meeting the minimum requirement of 0.1 mg/L free chlorine residual.

Effluent Turbidity

Parameter	Limit (NTU)	Test Level Range (NTU)	# Tests Not Meeting Requirements	Maximum Turbidity (NTU)	# Tests Required	# Tests Submitted
Turbidity	1.0	0.01 – 0.08	0	0.08	Continuous	On-line turbidity meter for continuous monitoring

Turbidity is a measure of water treatment efficiency. Turbidity measures the “clarity” of the drinking water and is generally reported in Nephelometric Turbidity Units (NTU). All waterworks are required to monitor turbidity at the water treatment plant. The turbidity data above summarizes the daily average turbidity entering the distribution system. The frequency of measurement varies from daily for small systems to continuous for larger waterworks. Prince Albert monitors the turbidity entering the distribution system on a continuous basis. On December 16, 2006 the turbidity parameter changed to “turbidity must never exceed 1.0 NTU and not exceed 0.3 NTU for more than 12 consecutive hours”.

Chemical – Health Category (off site testing)

Parameter	AO (mg/L)	Limit MAC (mg/L)	Limit IMAC (mg/L)	2007 Sample Average Results (mg/L)	Samples Exceeding MAC/IMAC (Dec 16/06)	# Samples Required	# Samples Submitted
Arsenic		-	0.025	0.0002	0	2 per year	3
Aluminum		-	-	0.0130	0	2 per year	11
Barium		1.0	-	0.059	0	2 per year	3
Boron		-	5.0	0.026	0	2 per year	3
Cadmium		0.005	-	<0.001	0	2 per year	3
Chromium		0.05	-	0.0041	0	2 per year	3
Copper	1	-	-	0.0012	0	2 per year	3
Fluoride (avg*)		1.5	-	0.49	0	2 per year	3
Iron	0.3	-	-	0.0062	0	2 per year	3
Lead		0.01	-	<0.001	0	2 per year	3
Manganese	0.05	-	-	0.003	0	2 per year	3
Nitrate (avg*)		45.0	-	0.15	0	2 per year	3
Selenium		0.01	-	0.00005	0	2 per year	3
Uranium		0.02	-	<0.0002	0	2 per year	3

Substances within the chemical health category may be naturally occurring in drinking water sources or may be the result of human activities. These substances may represent long-term health risk if the Maximum Acceptable Concentration (MAC) or Interim Maximum Acceptable Concentration (IMAC) is exceeded. If the Aesthetic Objectives (AO) are exceeded, it may affect the acceptance of water by consumers and/or interfere with the practice of supplying good quality water. All drinking water supplies are required to monitor for substance in the “ Chemical- Health “ category, the frequency of monitoring depends on the population served by the waterworks. Some waterworks add fluoride to drinking water as a means to aid in the prevention of dental decay.

** Results expressed as average values for communities or waterworks which fluoridate drinking water supplies or those with elevated concentrations of fluoride or nitrates.*

Chemical- Pesticides

Parameter	Limit MAC (mg/L)	Limit IMAC (mg/L)	2007 Sample Average Results (mg/L)	Samples Exceeding MAC/IMAC	# Samples Required (Dec 16/06)	# Samples Submitted
Atrazine		0.005	<0.002	0	1 per year	1
Bromoxynil		0.005	<0.0005	0	1 per year	1
Carbofuran	0.09	-	-	-	1 per year	1
Chlorpyrifos	0.09	-	-	-	1 per year	1
Dicamba	0.12	-	<0.0005	0	1 per year	1
Dichlorophenoxyacetic acid 2,4-D		0.1	<0.0005	0	1 per year	1
Diclofop-methyl	0.009	-	<0.001	0	1 per year	1
Dimethoate		0.02	0.005	-	1 per year	1
Malathion	0.19	-	0.002	-	1 per year	1
Pentachlorophenol	0.06	-	<0.002	0	1 per year	1
Picloram	-	0.19	<0.001	0	1 per year	1
Trifluralin	-	0.045	<0.001	0	1 per year	1

Pesticides in drinking water may occur as a result of the use of these substance by humans. These substances may represent long-term health risk if the Maximum Acceptable Concentration (MAC) or Interim Maximum Acceptable Concentration (IMAC) is exceeded. Mandatory sampling requirements depends on the population served by the waterworks.

Chemical - Trihalomethanes

Parameter	Limit IMAC) (mg/L)	2007 Sample Average Result (mg/L)	Samples Exceeding IMAC	# Samples Required (Dec 16/06)	# Samples Submitted
Trihalomethanes	0.1	0.032	0	4 per year	4

Trihalomethanes are generated during the water disinfection process as a by-product of reactions between chlorine and organic material. Trihalomethanes are generally found only in drinking water obtained from surface water supplies. Trihalomethanes are to be monitored on a quarterly basis with two samples collected from representative locations in the distribution system. The Interim Maximum Acceptable Concentration (IMAC) result is expressed as an average of 4 quarterly samples. Only water supplies derived from surface water or groundwater under the influence of surface water are required to monitor for Trihalomethanes.

Chemical - Cyanide and Mercury

Parameter	Limit MAC (mg/L)	2007 Sample Average Results (mg/L)	# Samples Exceeding MAC	# Samples Required (Dec 16/06)	# Samples Submitted
Cyanide	0.2	<0.001	0	2 per year	3
Mercury	0.001	<0.00005	0	2 per year	3

Mercury enters water supplies naturally and as a result of human activities. Cyanide can enter source waters as a result of industrial effluent or spill events. These substances may represent a long-term health risk if the Maximum Acceptable Concentration (MAC) is exceeded. Prince Albert is required to submit a sample once every six months, from the treated water at the water treatment plant. The date of the last sample was November 17, 2007.

Chemical – Synthetic Organic Chemicals

Parameter	Limit MAC (mg/L)	Limit IMAC (mg/L)	2007 Sample Average Results (mg/L)	Samples Exceeding MAC/IMAC	# Samples Required	# Samples Submitted
Benzene	0.005	-	0.0002	0	1 per year	1
Benzo(a)pyrene	0.00001	-	0.00001	0	1 per year	1
Carbon tetrachloride	0.005	-	0.0005	0	1 per year	1
Dichlorobenzene, 1,2	0.02	-	0.0005	0	1 per year	1
Dichlorobenzene, 1,4	0.005	-	0.0005	0	1 per year	1
Dichloroethane, 1,2	-	0.005	<0.0005	0	1 per year	1
Dichloroethylene. 1,1	0.014	-	<0.0004	0	1 per year	1
Dichloromethane	0.05	-	<0.0005	0	1 per year	1
Dichlorophenol, 2,4	0.9	-	<0.0002	0	1 per year	1
Monochlorobenzene	0.08	-	<0.0005	0	1 per year	1
Tetrachlorophenol,2,3,4,6	0.1	-	<0.0005	0	1 per year	1
Trichloroethylene	0.05	-	<0.0005	0	1 per year	1
Trichlorophenol, 2,4,6,	0.005	-	<0.0004	0	1 per year	1
Vinyl Chloride	0.002	-	<0.0005	0	1 per year	-
Xylene	-	-	<0.0002	0	1 per year	1

Contamination of drinking water by synthetic organic chemicals only results from pollution events. Contamination of drinking water in excess of Maximum Acceptable Concentration (MAC) or Interim Maximum Acceptable Concentrations (IMAC) may represent a health risk. All waterworks serving 5,000 persons or more are required to submit water samples for Saskatchewan Environment's "Organics" category. Samples for pesticide and organics analysis were submitted on December 14, 2007. Sample results indicated that the provincial drinking water quality standards were not exceeded.

More information on water quality and sample submission performance may be obtained from:

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