City Of Yorkton
Annual Notice to Consumers
For the Year 2009

According to Saskatchewan Environment's Water Regulations, Water Treatment Plants in Saskatchewan supplying water for human consumption shall continuously disinfect drinking water entering a distribution system by chlorination, or by any other approved means.

When chlorine is added to water, a reaction occurs creating two forms of powerful disinfectants known as "Total Chlorine Residual" and "Free Chlorine Residual". These disinfectants destroy disease-causing organisms within the water. Because the City of Yorkton chlorinates any water entering the municipal distribution system, these disinfectants ensure that Yorkton's drinking water is clean and safe for human consumption. Chlorinating water is also considered to be the most economical, efficient and easiest method of disinfecting water.

Unless otherwise stated in the Waterworks Permit, "***waterworks regulated by Saskatchewan Environment are required to maintain a level of 0.1mg/L (milligram per litre) free chlorine OR 0.5 mg/L of total chlorine in water distribution systems for long lasting protection***[1]". Saskatchewan Environment requires the City to test the free and total chlorine content once a day. Since there are no cases where both the free chlorine and total chlorine are under the limit, the City of Yorkton has met these expectations at every plant.

Summary of Total and Free Residual Chlorine in Distribution System for the Year 2009

Park Street Water Treatment Plant						
MONTH	No. of Samples	Free Chlorine Minimum	Free Chlorine Maximum	Total Chlorine Minimum	Total Chlorine Maximum	Do Readings Meet Water Quality Objectives?
January	31	0.70	1.80	0.96	2.00	Yes
February	28	0.28	1.57	0.60	1.91	Yes
March	31	0.60	1.96	0.88	2.20	Yes
April	30	0.60	2.09	0.88	2.28	Yes
May	31	0.20	2.20	0.38	2.42	Yes
June	30	0.24	1.87	0.56	2.12	Yes
July	31	0.41	2.08	0.97	2.88	Yes
August	31	0.69	1.91	0.97	2.26	Yes
September	30	0.64	1.59	1.05	2.02	Yes
October	31	0.66	2.05	0.96	2.19	Yes
November	30	0.82	1.98	0.91	2.20	Yes
December	31	0.29	1.99	1.07	2.20	Yes

*Each of these values is in mg/L.

[1] Section 14: Chlorine and Water Disinfection; Saskatchewan Drinking Water Information Binder

West Broadway Water Treatment Plant						
MONTH	No. of Samples	Free Chlorine Minimum	Free Chlorine Maximum	Total Chlorine Minimum	Total Chlorine Maximum	Do Readings Meet Water Quality Objectives?
January	31	0.19	1.86	0.37	2.16	Yes
February	28	0.51	1.78	0.55	1.91	Yes
March	31	0.55	1.62	1.01	2.11	Yes
April	30	0.35	1.57	0.58	1.97	Yes
May	31	0.14	1.87	0.32	2.15	Yes
June	30	0.64	2.15	1.01	2.82	Yes
July	31	0.43	2.20	1.15	2.60	Yes
August	31	0.56	3.42	1.00	4.20	Yes
September	30	0.44	1.39	0.91	1.85	Yes
October	31	0.49	1.07	0.77	1.44	Yes
November	30	0.32	1.11	0.75	1.62	Yes
December	31	0.44	1.42	0.83	1.62	Yes

*Each of these values is in mg/L.

No. 4 Water Treatment Plant						
MONTH	No. of Samples	Free Chlorine Minimum	Free Chlorine Maximum	Total Chlorine Minimum	Total Chlorine Maximum	Do Readings Meet Water Quality Objectives?
January	31	0.91	1.41	1.17	1.72	Yes
February	28	0.61	1.57	1.10	1.96	Yes
March	31	0.73	1.59	1.01	1.93	Yes
April	30	0.90	2.09	1.23	2.50	Yes
May	31	0.26	1.09	0.66	1.61	Yes
June	30	0.29	1.92	0.68	2.58	Yes
July	31	0.46	1.95	0.98	2.40	Yes
August	31	0.38	1.33	1.25	1.85	Yes
September	30	0.64	1.97	0.92	2.19	Yes
October	31	0.43	1.69	0.91	2.28	Yes
November	30	0.48	1.69	1.16	1.98	Yes
December	31	0.66	1.91	1.15	2.44	Yes

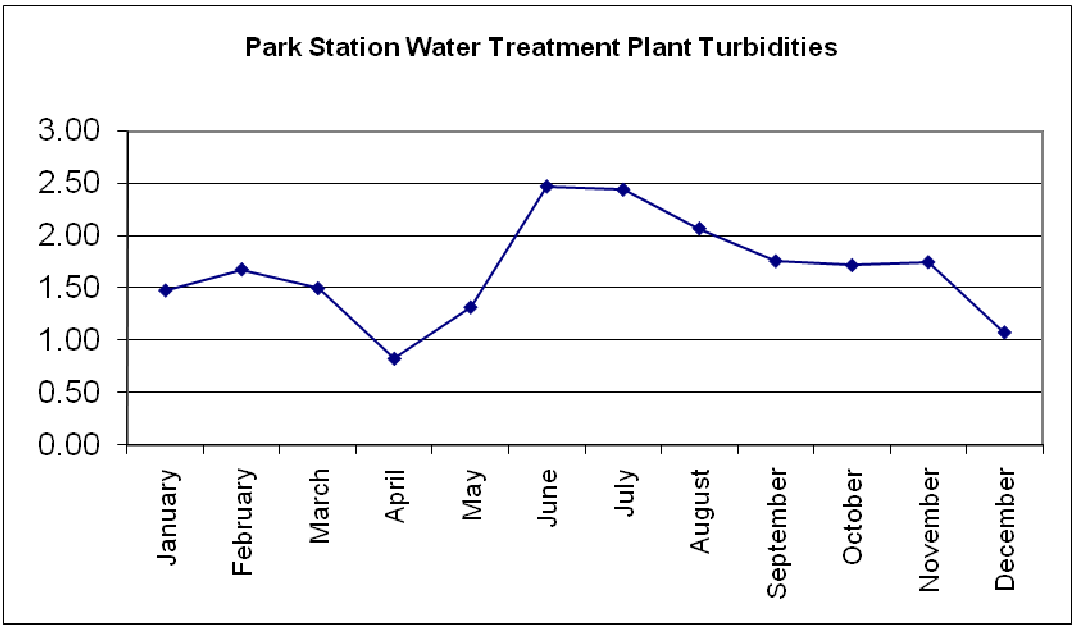
*Each of these values is in mg/L.

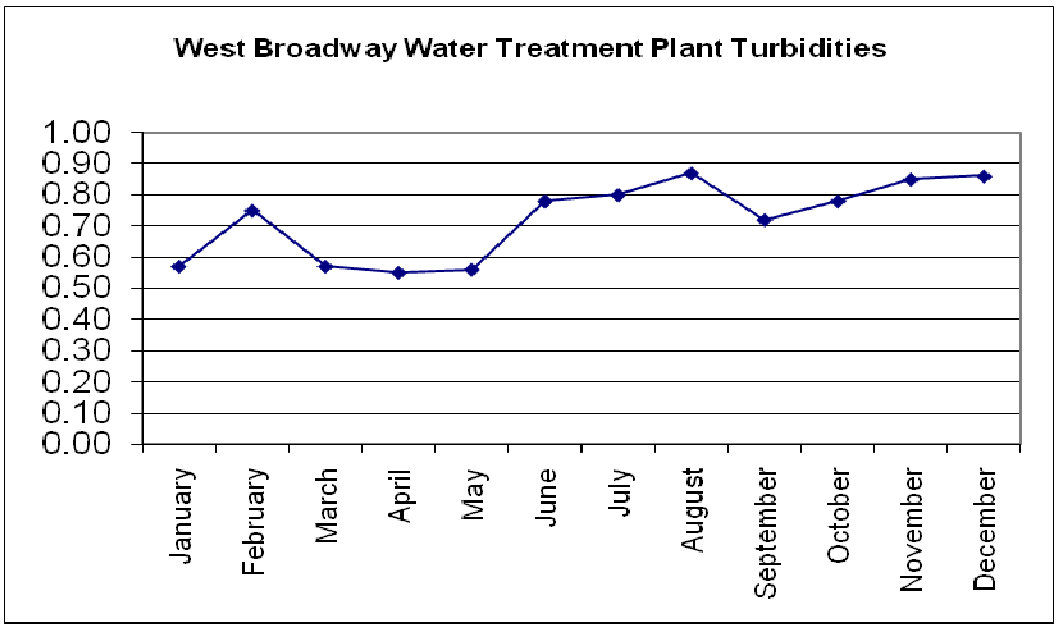
The City of Yorkton monitors turbidity at each of the three water treatment plants daily, as well as within the distribution system. Turbidity refers to how clear the water is. The major effect that turbidity has on drinking water is the appearance of it; people do not like the look, taste, or smell of discoloured water. Here in Yorkton, turbidity is related to oxidized iron and manganese, two minerals that are naturally occurring in Yorkton's water. Effective December 5, 2006, The Water Regulations Act,2002, stipulate in Section 33.(2).(e)., the following; "*In the case of a ground water treatment plant, for water entering the distribution system or water pipelines, turbidity levels must not exceed 1.0 NTU:"*

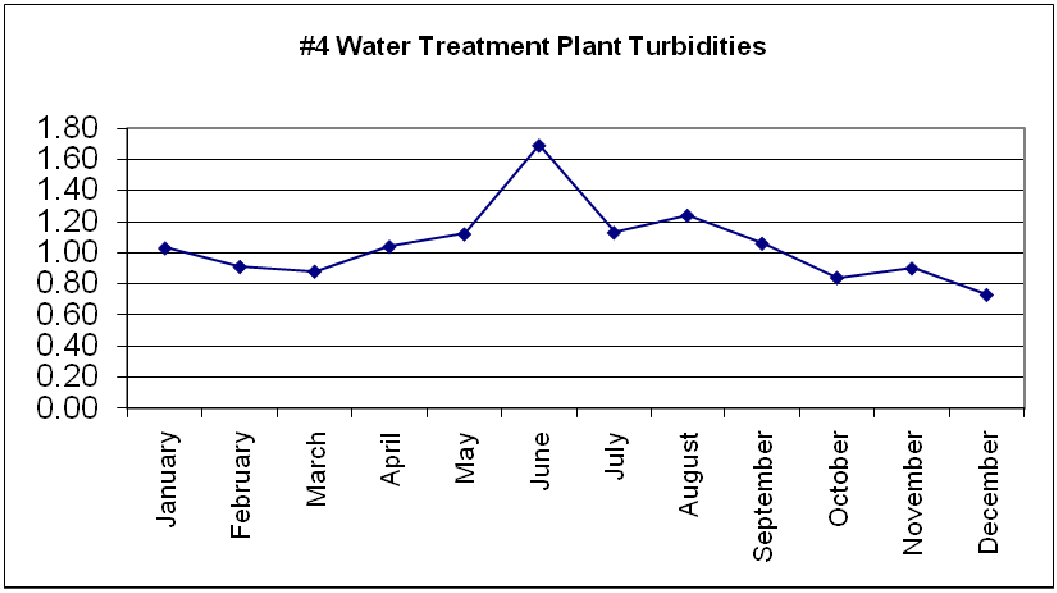
(i) *in at least 95% of the discrete measurements made for each calendar month; or*

(ii) *at least 95% of the time each calendar month if continuous turbidity monitoring is employed.*

Currently the City of Yorkton is in the process of constructing a new Water Treatment Plant to deal with its turbidity issue. The following graphs show the monthly average turbidity levels.




West Broadway Water Treatment Plant Turbidities
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
January
February
March
April
May
June
July
August
September
October
November
December


#4 Water Treatment Plant Turbidities
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
January
February
March
April
May
June
July
August
September
October
November
December

The City of Yorkton also monitors the chemical make up of the water. Two samples are taken from each plant every year to determine the minerals and their concentration.

The majority of these properties are known as aesthetic objectives. **They are parameters that may affect consumer acceptance of drinking water, such as taste, odour and colour. They do not however pose any danger to the consumer.** For this reason, some properties do not have objectives or limits. Others have guidelines set, but they are not mandatory as these objectives are in the range where they do not constitute a health hazard.

Summary of Minerals within water for
Park St. Water Treatment Plant for the Year 2009

	Reading Aug. 4, 2009	Reading Dec. 9, 2009	Saskatchewan Environment Water Quality Objective	Do Measurements Meet Aesthetic Water Quality Objectives	
				Yes	No
pH	7.94	7.80	6.5-9	X	
Calcium (Ca)	155	171	No Standard		
Magnesium (Mg)	75	79	<200.0	X	
Sodium (Na)	138	152	<300.0	X	
Potassium (K)	9.9	11	No Standard		
Bicarbonate (HCO_3)	484	455	No Standard		
Carbonate (CO_3)	<1	<1	No Standard		
Sulphate (SO_4)	470	500	<500.0	X	
Chloride (Cl)	69	74	<250.0	X	
Nitrate (NO_3)	4.2	4.9	<45.0	X	
Fluoride (F) (Not added: occurs naturally ground water)	0.29	0.25	<1.50	X	
Total Hardness (Measurement of Calcium Carbonate $CaCO_3$)	695	751	<800.0	X	
Total Dissolved Solids	1230	1360	<1500	X	
Total Alkalinity	397	373	<500	X	
Conductivity	1720	1850	1500		X

- Note: All measurements are in mg/L which is equivalent to Parts per Million.

Summary of Minerals within water for
West Broadway Water Treatment Plant for the Year 2009

	Reading 1 Aug. 4, 2009	Reading 2 Dec. 9, 2009	Saskatchewan Environment Water Quality Objective	Do Measurements Meet Aesthetic Water Quality Objectives	
				Yes	No
pH	7.95	7.88	6.5-9	X	
Calcium (Ca)	158	166	No Standard		
Magnesium (Mg)	55	55	<200.0	X	
Sodium (Na)	22	23	<300.0	X	
Potassium (K)	9.9	9.6	No Standard		
Bicarbonate (HCO_3)	531	515	No Standard		
Carbonate (CO_3)	<1	<1	No Standard		
Sulfate (SO_4)	220	230	<500.0	X	
Chloride (Cl)	18	25	<250.0	X	
Nitrate (NO_3)	2.2	1.2	<45.0	X	
Fluoride (F) (Not added: occurs naturally ground water)	0.34	0.28	<1.50	X	
Total Hardness (Measurement of Calcium Carbonate $CaCO_3$)	620	640	<800.0	X	
Total Dissolved Solids	804	807	<1500	X	
Total Alkalinity	435	422	<500	X	
Conductivity	1160	1180	1500	X	

- Note: All measurements are in mg/L which is equivalent to Parts per Million

Summary of Minerals within water for
#4Water Treatment Plant for the Year 2009

	Reading 1 Aug. 4, 2009	Reading 2 Dec. 9, 2009	Saskatchewan Environment Water Quality Objective	Do Measurements Meet Aesthetic Water Quality Objectives	
				Yes	No
pH	7.97	7.84	6.5-9	X	
Calcium (Ca)	136	138	No Standard		
Magnesium (Mg)	73	70	<200.0	X	
Sodium (Na)	59	56	<300.0	X	
Potassium (K)	15	14	No Standard		
Bicarbonate (HCO_3)	476	478	No Standard		
Carbonate (CO_3)	<1	<1	No Standard		
Sulfate (SO_4)	320	310	<500.0	X	
Chloride (Cl)	44	41	<250.0	X	
Nitrate (NO_3)	0.97	06.2	<45.0	X	
Fluoride (F) (Not added: occurs naturally ground water)	0.20	0.20	<1.50	X	
Total Hardness (Measurement of Calcium Carbonate $CaCO_3$)	639	632	<800.0	X	
Total Dissolved Solids	954	909	<1500	X	
Total Alkalinity	390	392	<500	X	
Conductivity	1360	1310	1500	X	

- Note: All measurements are in mg/L which is equivalent to Parts per Million

The metal content of the water is also monitored. One sample from each treatment plant is taken every year to determine the metallic composition. It should be noted that there is no limit given for aluminum. This is because the concentration needed to cause any kind of harm to consumers is significantly beyond the trace found in Saskatchewan aquifers.

Summary of Metals within water for Park St. Water Treatment Plant for 2009

	Reading Dec. 9, 2009	Saskatchewan Environment Water Quality Objective	Do readings meet Water Quality Objectives	
			Yes	No
Arsenic (As)	0.0012	<0.010	X	
Cyanide	<0.001	0.2	X	
Mercury (Hg)	<0.0002	0.001	X	
Selenium (Se)	<0.0001	0.01	X	
Aluminum (Al)	<0.0005	No Standard		
Boron (B)	0.18	5.0	X	
Barium (Ba)	0.017	1.0	X	
Cadmium (Cd)	<0.0001	0.005	X	
Chromium (Cr)	<0.0005	0.05	X	
Copper (Cu)	0.0032	1.0	X	
Iron (Fe)	0.035	<0.3	X	
Manganese (Mn)	0.43	0.05		X
Lead (Pb)	<0.0001	0.01	X	
Zinc (Zn)	0.0014	5.0	X	
Uranium (U)	0.0075	0.02	X	

- Note: All measurements are in mg/L which is equivalent to Parts per Million
- Note: Since manganese is an aesthetic objective, compliance is not mandatory.

Summary of Metals within water for
West Broadway Water Treatment Plant for 2009

	Reading Dec. 9, 2009	Saskatchewan Environment Water Quality Objective	Do readings meet Water Quality Objectives	
			Yes	No
Arsenic (As)	0.0010	<0.010	X	
Cyanide	<0.0001	0.2	X	
Mercury (Hg)	<0.0002	0.001	X	
Selenium (Se)	0.0002	0.01	X	
Aluminum (Al)	<0.0005	No Standard		
Boron (B)	0.11	5.0	X	
Barium (Ba)	0.020	1.0	X	
Cadmium (Cd)	<0.0001	0.005	X	
Chromium (Cr)	<0.0005	0.05	X	
Copper (Cu)	0.11	1.0	X	
Iron (Fe)	0.017	<0.3	X	
Manganese (Mn)	0.022	0.05	X	
Lead (Pb)	0.0007	0.01	X	
Zinc (Zn)	0.010	5.0	X	
Uranium (U)	0.0037	0.02	X	

* Note: All measurements are in mg/L which is equivalent to Parts per Million

Summary of Metals within water for
#4 Water Treatment Plant for 2009

	Reading Dec. 9, 2009	Saskatchewan Environment Water Quality Objective	Do readings meet Water Quality Objectives	
			Yes	No
Arsenic (As)	0.0015	<0.010	X	
Cyanide	<0.001	0.2	X	
Mercury (Hg)	<0.0002	0.001	X	
Selenium (Se)	<0.0001	0.01	X	
Aluminum (Al)	<0.0005	No Standard		
Boron (B)	0.09	5.0	X	
Barium (Ba)	0.013	1.0	X	
Cadmium (Cd)	<0.0001	0.005	X	
Chromium (Cr)	<0.0005	0.05	X	
Copper (Cu)	0.0012	1.0	X	
Iron (Fe)	0.019	<0.3	X	
Manganese (Mn)	0.016	0.05	X	
Lead (Pb)	<0.0001	0.01	X	
Zinc (Zn)	0.0028	5.0	X	
Uranium (U)	0.0089	0.02	X	

* Note: All measurements are in mg/L which is equivalent to Parts per Million

The City of Yorkton tests pesticide and organic content of the water. As governed by Saskatchewan Environment, a sample is taken from all water treatment plants once every three years. In 2008, all three plants yielded the exact same pesticide and organic concentrations. They can be found in the following charts.

Summary of Pesticides within water for 2008

	Reading July 29, 2008	Saskatchewan Environment Water Quality Objective	Do readings meet Water Quality Objectives	
			Yes	No
Atrazine	<0.0002	0.005	X	
Bromoxynil	<0.00005	0.005	X	
Carbofuran	<0.00005	0.09	X	
Chlorpyrifos (Lorsban)	<0.00002	0.09	X	
Dicamba (Banvel)	<0.00005	0.12	X	
Dichlorophenoxyacetic Acid 2,4 (2,4-D)	<0.0002	0.1	X	
Diclofop-methyl (Hoe Grass)	<0.0001	0.009	X	
Dimethoate (Cygon)	<0.05	0.02	X	
Malathion	<0.05	0.19	X	
Pentachlorophenol (PCP)	<0.0005	0.06	X	
Picloram (Tordon)	<0.0001	0.19	X	
Trifluralin (Treflin)	<0.05	0.045	X	

* Note: All measurements are in mg/L which is equivalent to Parts per Million

***** Note: The City of Yorkton's Permit asks for Pesticide sampling once every three years, therefore 2008 sampling complies to Pesticide parameters.

Summary of Organics within water for 2008

	Reading July 29, 2008	Saskatchewan Environment Water Quality Objective	Do readings meet Water Quality Objectives	
			Yes	No
Benzene	<0.0002	0.005	X	
Benzo (a) pyrene	<0.00001	0.00001	X	
Carbontentrachloride	<0.0005	0.005	X	
Dichlorobenzene 1,2	<0.0005	0.2	X	
Dichlorobenzene 1,4	<0.0005	0.005	X	
Dichloroethane 1,2	<0.0005	0.005	X	
Dichloroethylene 1,1	<0.0005	0.014	X	
Dichloromethane	<0.0005	0.05	X	
Dichlorophenol	<0.0002	0.9	X	
Ethylbenzene	<0.0002	0.005	X	
Monochlorobenzene	<0.0005	0.08	X	
Tetrachlorophenol 2,3,4,6	<0.0005	0.1	X	
Toluene	<0.0002	0.005	X	
Trichloroethylene	<0.0005	0.05	X	
Trichlorophenol 2,4,6	<0.0002	0.005	X	
Vinyl Chloride	<0.0005	0.002	X	
Xylene	<0.0002	No Standard		

* Note: All measurements are in mg/L which is equivalent to Parts per Million

Saskatchewan Environment required the City of Yorkton Waterworks to take three (3) samples of water per week for Bacteriological testing in 2009. The City of Yorkton took three (3) samples per week in 2009. Samples are sent to the Provincial Water Laboratory in Regina, and the lab there performs the tests. The samples are tested for total coliform bacteria, which is a *"group of bacteria found in high numbers in both human and animal intestinal wastes and are therefore are found in water that has been contaminated with fecal material."*[2] They are also tested for fecal coliform bacteria, "*a subset of the total coliform bacterial group and are also are found in human and animal intestinal wastes*"[3] and an indicator of the potential presence of pathogens. 'Positive' tests are ones where any coliform bacteria or background bacteria is detected within the sample greater than 200 colonies per 100ml of water, which for example, could be caused by an operator sampling with dirty hands. This situation requires that we re-sample, and send the sample back to the laboratory for testing again. All of the samples that had a background coliform count came back as negative results after the second test. With a 'negative' test, the bacteria count is undetectable.

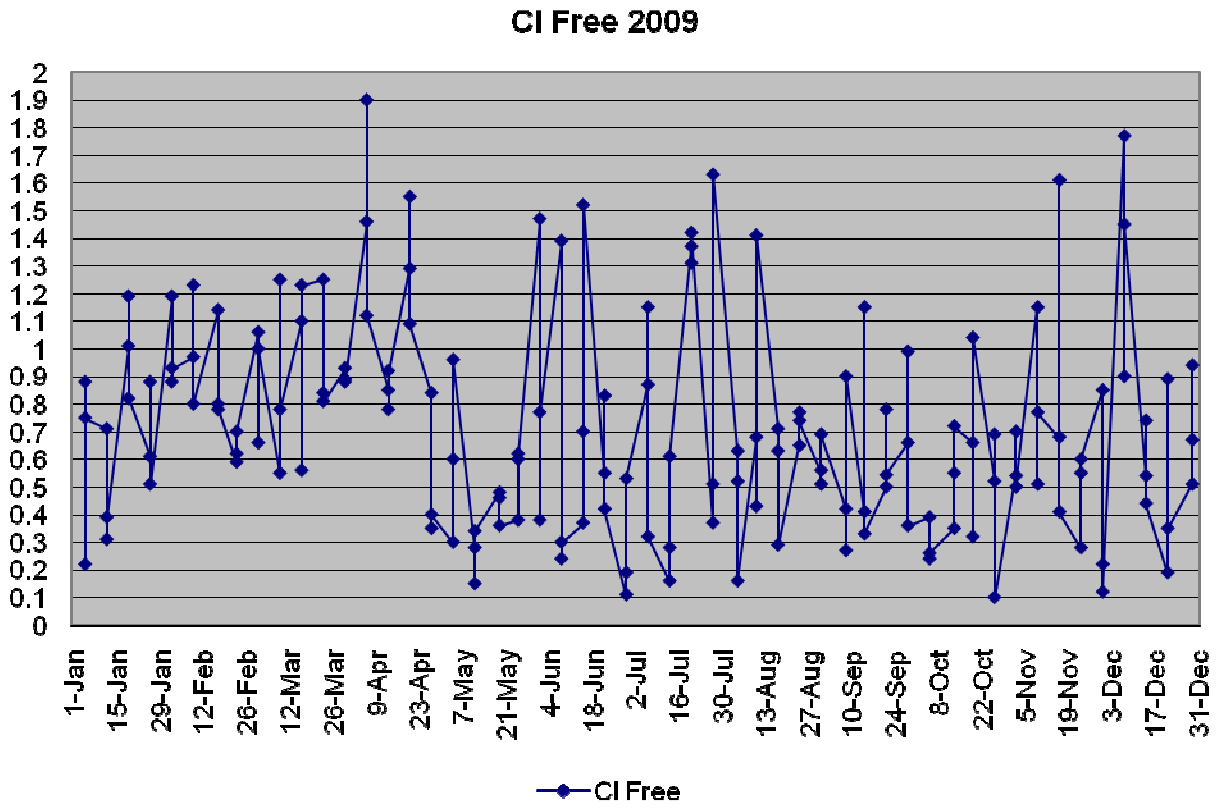
The City Of Yorkton is required by Saskatchewan Environment to submit 144 samples to be tested. For the year 2009, The City of Yorkton submitted 170 samples.

Summary of Bacteriological Testing for 2009

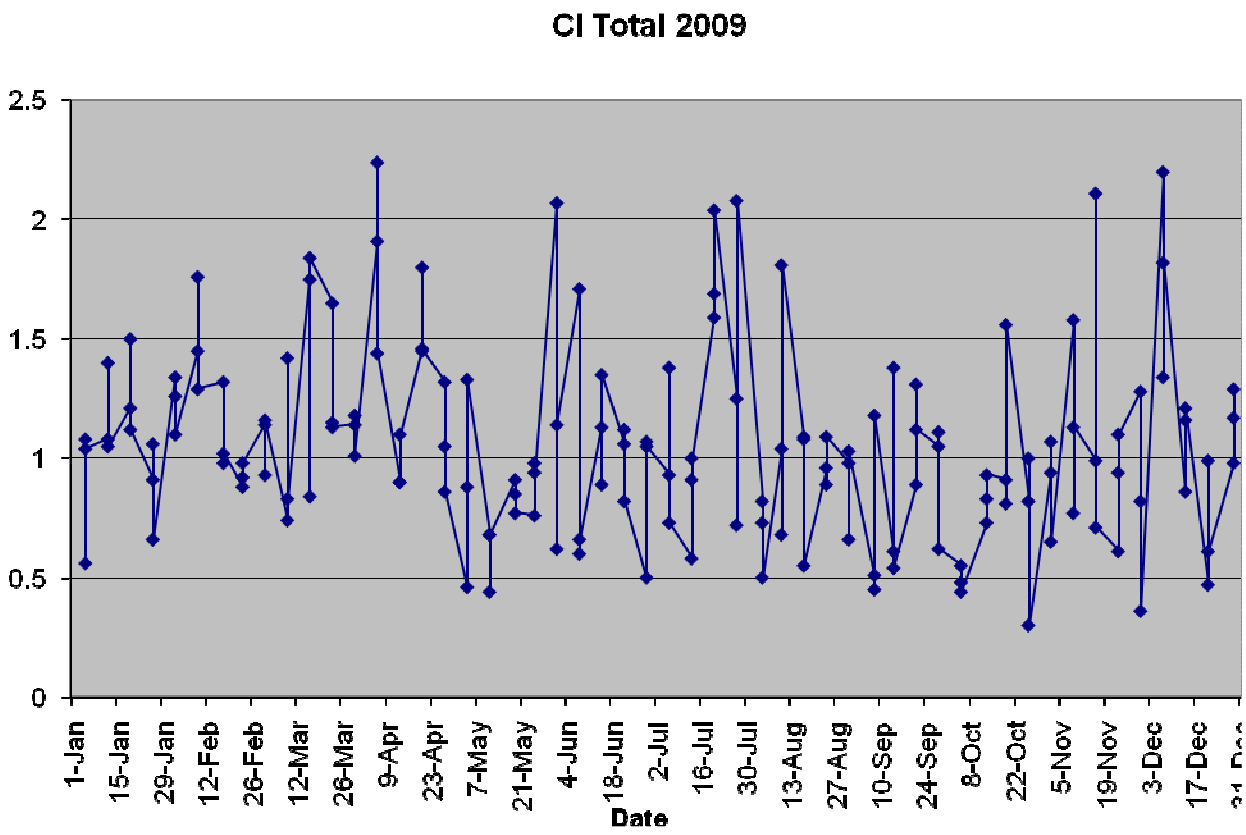
Total # submitted samples for 2009	170
Total negative tests	170
Percent of Negative Test Results	100%
Total Positive Test Results on initial samples	0
Percent of Positive Test Results on Initial Samples	0%
Percent of Positive Tests on Repeat Samples	0%

[2] and [3] http://www.creekwebsite.org/FactsandFAQS/FACTS_coliform.htm

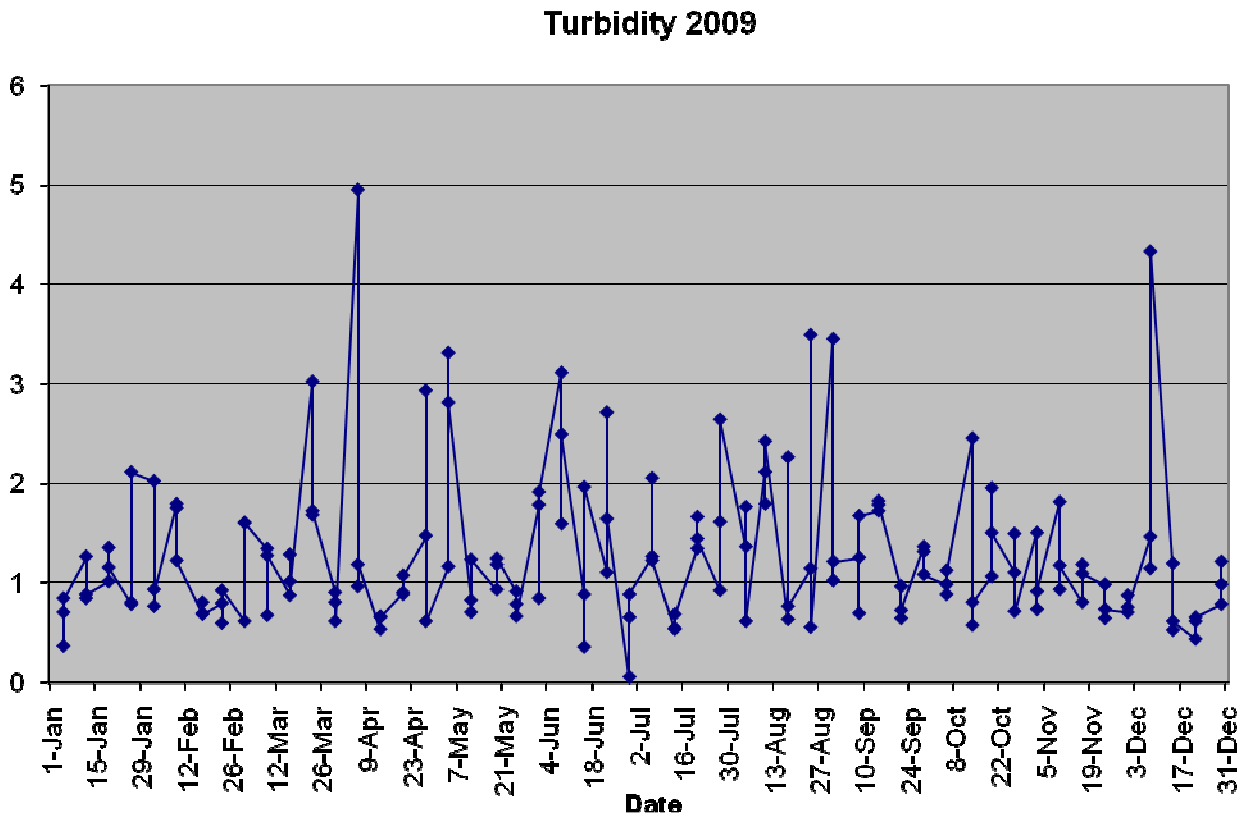
Along with the bacteriological testing, the Provincial Lab tests for free and total chlorine content as well as turbidity in the distribution system. These results can be found in the following graphs.



Minimum free chlorine content is 0.1 mg/l



Minimum total chlorine content is 0.5 mg/l



Maximum level for turbidity is 1.0 NTU

The City of Yorkton Waterworks is committed to supplying clean, safe drinking water. For more information, please visit our website at http://www.city.yorkton.sk.ca/dept/pweng/waterworks/water/index.asp