City of Lloydminster
Drinking Water Quality and Compliance
2017 Annual Notice to Consumers

The Water Security Agency and Ministry of 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 the City of Lloydminster water quality and sample submission compliance record for the January 1 – December 31, 2017 time period. This report was completed on February 8, 2018. Readers should refer to Saskatchewan Water Security Agency's Municipal Drinking Water Quality Monitoring Guidelines, June 2015, EPB 502 for more information on minimum sample submission requirements. Permit requirements for a specific waterworks may require more sampling than outlined in the department's monitoring guidelines. If consumers need more information on the nature and significance of specific water tests, for example, "what is the significance of selenium in a water supply", more detailed information is available from: http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/index_e.html .

Water Quality Standards

Bacteriological Quality

Parameter	Limit	Distribution Samples Required/yr	Distribution Samples Submitted	# of Positive Regular Samples Submitted
Total Coliform	0 organisms/100 mL	312	322	0
E.coli	0 organisms/100 mL	312	322	0

The City of Lloydminster is responsible to ensure that one hundred percent of all bacteriological samples are submitted as required. Outlined in the Permit to Operate a Waterworks, the City is required to take a minimum of 6 samples per week or 312 samples per year. An additional Bacteriological sample is taken monthly to ensure we exceed the minimum requirement.

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

Parameter	Minimum Limit (mg/L)	Free Chlorine Residual Range	Total Chlorine Residual Range	# of Tests Required/yr	# of Tests Submitted	# of Adequate Chlorine (%)
Chlorine Residual in Distribution System	0.1 mg/L free OR 0.5 mg/L total	0.29-1.45 mg/L	0.50-1.55 mg/L	260	270	(100%)

*A minimum of 0.1 milligrams per liter (mg/L) free chlorine residual **OR** 0.5 mg/L total chlorine residual is required at all times throughout the distribution system. The City is required to test chlorine residuals on every bacteriological sample submitted. Routine locations include; Redhead Equipment, Servus Sports Center, Leisure Center, West End Reservoir and Co-op gas station (west). An additional sample is taken monthly at various locations throughout the city.*

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

Parameter	Limit (mg/L)	Test Level Range (mg/L)	# of Tests Performed	# of Tests Not Meeting Requirements
Free Chlorine Residual	at least 0.1	0.87-1.77	Minimum 1 test/day	0

A minimum of 0.1 milligrams per litre (mg/L) free chlorine residual is required for water entering the distribution system. The City performs chlorine tests daily in the laboratory and has continuous on-line Cl2 monitoring to ensure treated water entering the distribution system has at least 0.5 mg/L of free Cl2 residual or more at all times.

Turbidity

Parameter	Limit (NTU)	Test Level Range	Maximum Allowable Turbidity (NTU)	# of Tests Not Meeting Requirements	# of Tests Required	# of Tests Completed
Turbidity	0.3	0.04 – 0.20	1.0	0	365/yr.	365

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). Tests are performed daily in lab and the WTP has 5 continuous on- line Turbidimeters to ensure no treated water has Turbidity levels exceeding 0.3 NTU's for 12 consecutive hours.

Chemical – Health Category

Sampling Date: May 24, 2017

Parameter	Limit MAC (mg/L)	Limit IMAC (mg/L)	Aesthetic Objective (mg/L)	Sample Results (mg/L)	Samples Exceeding MAC/IMAC	# of Samples Required/yr.	# of Samples Submitted
Aluminum				0.080	0	1	1
Arsenic	0.010			0.0003	0	1	1
Barium	1.0			0.056	0	1	1
Boron		5.0		0.02	0	1	1
Cadmium	0.005			0.00001	0	1	1
Chromium	0.05			< 0.0005	0	1	1
Copper			1.0	0.0031	0	1	1
Iron			0.3	0.0009	0	1	1
Lead	0.01			< 0.0001	0	1	1
Manganese			0.05	0.0007	0	1	1
Selenium	0.01			< 0.0001	0	1	1
Silver				< 0.00005	0	1	1
Uranium	0.02			0.0004	0	1	1
Zinc			5.0	< 0.0005	0	1	1

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 a long-term health risk if the Maximum Acceptable Concentration (MAC) or Interim Maximum Acceptable Concentration (IMAC) is exceeded.
Please note any sample result indicating "<" is non-detectable.

Chemical – Pesticides

Sampling Date: May 24, 2017

Parameter	Limit MAC (µg/L)	Limit IMAC(µg/L)	Sample Result(µg/L)	Samples Exceeding MAC/IMAC	# of Samples Required/2yrs	# of Samples Submitted
Atrazine		5.0	< 0.2	0	1	1
Bromoxynil		5.0	< 1	0	1	1
Carbofuran	90		< 0.2	0	1	1
Chlorpyrifos	90		< 0.2	0	1	1
Dicamba (Banvel)	120		< 1	0	1	1
2,4-D*		100	< 1	0	1	1
Diclofop-methyl	9.0		< 1	0	1	1
Dimethoate		200	< 2	0	1	1
Malathion	190		< 0.2	0	1	1
MCPA	100		< 1	0	1	1
Pentachlorophenol	60		< 2	0	1	1
Picloram		190	< 1	0	1	1
Trifluralin		45	< 0.2	0	1	1

Pesticides in drinking water may occur as a result of these substances used by humans. These substances may represent a long-term health risk if the Maximum Acceptable Concentration (MAC) or Interim Maximum Acceptable Concentration (IMAC) is exceeded. Please note any sample result indicating "<" is non-detectable.

Chemical – Trihalomethanes (THMs) and Haloacetic Acids (HAAs)

Parameter	Limit (µg/L)	Sample Results Average (µg/L)	# Samples Required/yr.	# Samples Submitted
Trihalomethanes	100	60.8	8	8
Haloacetic Acids	80	52.5	8	8

Trihalomethanes and Haloacetic Acids are generated during the water disinfection process by a by-product of reactions between chlorine and organic material. Trihalomethanes are generally found only in drinking water obtained from surface water supplies. Trihalomethanes and Haloacetic Acids are to be monitored on a quarterly basis and the Interim Maximum Acceptable Concentration is expressed as an average of 4 quarterly samples.

Algal Toxins –Microcystin-LR

Parameter	Limit (mg/L)	Sample Results (mg/L)	# Samples Required/yr.	# Samples Submitted
Microcystin LR	0.0015	<0.0001	As required	1

Microcystin LR is an algal toxin typically released following die-off on an algal bloom in a raw surface water supply. Samples should typically be collected and analyzed on a monthly basis during periods when algae blooms on reservoirs or other surface water sources occur."<" is non-detectable

Chemical - General Chemical

Parameter	Aesthetic Objectives* (mg/L)	Sample Results (average mg/L)	# Samples Required	# Samples Submitted
Alkalinity	500	134	4	4
Bicarbonate	No Objective	164	4	4
Calcium	No Objective	50	4	4
Chloride	250	9.0	4	4
Conductivity	No Objective	424.5	4	4
Fluoride	1.5	0.12	4	4
Hardness	800	184	4	4
Magnesium	200	14.5	4	4
Nitrate	45	1.30	4	4
PH	No Objective	7.9	4	4
Sodium	300	11	4	4
Sulphate	500	73.5	4	4
Total dissolved solids	1500	260	4	4

Samples were submitted for General Chemical analysis on February 15, May 24, August 16 and November 22, 2017. Sample results indicated that there were no exceedances of the provincial aesthetic objectives for the General Chemical category.

PLEASE NOTE: The city does not add Fluoride into the treated water. Trace amounts are found naturally in the source water.

**Objectives apply to certain characteristics of or substances found in water for human consumptive or hygienic use. The presence of these substances will affect the acceptance of water by consumers and/or interfere with the practice of supplying good quality water. Compliance with drinking water aesthetic objectives is not mandatory as these objectives are in the range where they do not constitute a health hazards. The aesthetic objectives for several parameters (including hardness as $CaCO_3$, magnesium, sodium and total dissolved solids) consider regional differences in drinking water sources and quality*

Chemical – Cyanide and Mercury

Sampling Date: May 24, 2017

Parameter	Limit MAC (µg/L)	Sample Result (µg/L)	# of Samples Exceeding MAC	# of Samples Required/yr.	# of Samples Submitted
Cyanide	200	< 1.0	0	1	1
Mercury	1.0	< 0.001	0	1	1

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. Mandatory sampling requirements depend on the population served by the waterworks.

Chemical – Synthetic Organic, BTEX, PFOS &PFOA

Sampling Date: May 24, 2017

Parameter	Limit MAC (µg/L)	Limit IMAC (µg/L)	Aesthetic Objective (µg/L)	Sample Result (µg/L)	# Samples Exceeding Limit	# Samples Required/2yrs	# Samples Submitted
Benzene	5.0			< 0.2	0	1	1
Benzo (a) pyrene	0.01			< 0.01	0	1	1
Carbon tetrachloride	5.0			< 2	0	1	1
Dichlorobenzene, 1,2	20			< 0.5	0	1	1
Dichlorobenzene, 1,4	5.0			< 0.5	0	1	1
Dichloroethane, 1,2		5.0		< 0.5	0	1	1
Dichloroethylene 1,1	14			< 0.5	0	1	1
Dichloromethane	50			< 0.5	0	1	1
Dichlorophenol, 2,4	900			< 2	0	1	1
Ethylbenzene			2.4	< 0.2	0	1	1
Monochlorobenzene	80			< 0.5	0	1	1
Perfluorooctane Sulfonate				< 0.10	0	1	1
Perfluorooctanoic Acid				< 0.02	0	1	1
Tetrachlorophenol, 2,3,4,6				< 2	0	1	1
Toluene			24	< 0.2	0	1	1
Trichloroethylene	50			< 0.5	0	1	1
Trichlorophenol, 2,4,6	5.0			< 2	0	1	1
Vinyl Chloride	2.0			< 0.5	0	1	1
Xylene			300	< 0.2	0	1	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 Concentration (IMAC) may represent a health risk. Please note any sample result indicating "<" is non-detectable.

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

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