

# Saskatchewan's Drinking Water Quality Standards and Objectives (Summarized)



Standards and objectives can be applied to water for both hygienic use and human consumption. In general, standards are mandatory for systems that supply water for human consumptive use. For systems that supply water for hygienic use, only bacteriological standards apply. Both systems should also strive to achieve the water quality objectives.

## Explanation of Terms

Maximum Acceptable Concentration (MAC)

Interim Maximum Acceptable Concentration (IMAC)

Aesthetic Objective (AO)

Apparent Color Unit (ACU)

Nephelometric Turbidity Unit (NTU)

Milligrams per Litre (mg/L)

## Standards

Standards are legally enforceable requirements for drinking water quality and are set out in *The Waterworks and Sewage Works Regulations*. Parameters marked with an \* have been added or changed in comparison with *The Water Regulations, 2002*.

**Bacteriological Standards:** Effective immediately, standards include:

• total coliform levels of zero organisms detectable per 100 millilitre (mL);

• *E. coli*\* levels of zero organisms detectable per 100 mL; and

• background bacteria levels on a total coliform filtration plate of less than 200 colonies per 100 mL or no overgrowth.

**Turbidity Standards:** Turbidity is an important indicator of water treatment process efficiency from both health and aesthetic perspectives. Compliance with turbidity standards is immediate for newly constructed and existing waterworks.

Source/Treatment	Routine Standard	Continuous Monitoring Time Duration Maximum	Absolute Maximum
Surface water <sup>1,2</sup> : Chemically Assisted Filtration - When monthly source water average is 1.5 NTU or more	Less than 0.3 NTU, 95% of discrete measurements or 95% <sup>4</sup> of the time if continuous monitoring employed	Not to exceed 0.3 NTU for more than 12 consecutive hours if continuous monitoring employed	Never to exceed 1.0 NTU
Surface water <sup>1,2</sup> : Chemically Assisted Filtration - When monthly source water average is less than 1.5 NTU	Less than 0.2 NTU, 95% of discrete measurements or 95% <sup>4</sup> of the time if continuous monitoring employed	Not to exceed 0.2 NTU for more than 12 consecutive hours if continuous monitoring employed	Never to exceed 1.0 NTU
Surface water <sup>1,2</sup> : Membrane Filtration	Less than 0.1 NTU, 99%* of discrete measurements or 99% <sup>4</sup> of the time if continuous monitoring employed	No stated standard	Never to exceed 0.1 NTU for greater than 15 minutes
Surface water <sup>1,2</sup> : Slow Sand or Diatomaceous Earth Filtration	Less than 1.0 NTU, 95% of discrete measurements or 95% <sup>4</sup> of the time if continuous monitoring employed	Not to exceed 1.0 NTU for more than 12 consecutive hours if continuous monitoring employed	Never to exceed 3.0 NTU
Groundwater <sup>3</sup>	Less than 1.0 NTU, 95% of discrete measurements or 95% <sup>4</sup> of the time if continuous monitoring employed	No stated standard	No stated standard - see permit

<sup>1</sup> Includes surface waters and groundwater under the influence of surface water. <sup>2</sup> Turbidity value measured from each filter effluent. <sup>3</sup> Turbidity value for water entering the distribution system.

<sup>4</sup> Measurements made in each calendar month. Other requirements apply for novel surface water treatment technologies.

## Chemical-Health/Pesticides/Radiological

These include a range of substances that are known or suspected to cause adverse effects on health. These values have been derived to safeguard health on the basis of life long consumption. Compliance with chemical standards is immediate for newly constructed waterworks. Under the *Water Regulations, 2002* existing waterworks producing water for human consumptive were required to meet the standards by December 5, 2010 for systems serving a population of less than 5,000 and by December 5, 2008 for systems serving a population of 5,000 or more. Upgrading deadlines for some new or revised standards are July 1, 2020 under *The Waterworks and Sewage Works Regulations*. Please refer to the regulations for specific upgrading deadlines.

Chemical-Health Category			Chemical Pesticides (commonly used in Saskatchewan)			Radiological <sup>8</sup>	
Parameter	MAC (mg/L)	IMAC (mg/L)	Parameter	MAC (mg/L)	IMAC (mg/L)	Screening Parameter	Concentration Becquerels Per litre (Bq/L)
Arsenic*	0.010		Atrazine		0.005	Gross alpha*	0.5
Barium	1		Bromoxynil		0.005	Gross beta*	1.0
Benzene	0.005		Carbofuran	0.09		Lead-210*	1.0
Benzo(a)pyrene	0.00001		Chlorpyrifos	0.09		Radium-226*	0.2
Boron		5.0	Dicamba	0.12		Tritium*	7000
Bromate*	0.01		2,4-D <sup>5</sup>		0.1	Strontium-90*	5
Cadmium	0.005		Diclofop-methyl	0.009		Iodine-131*	6
Carbon tetrachloride	0.005		Dimethoate		0.02	Cesium-137*	10
Chlorate*	1.0		Malathion	0.19			
Chlorite*	1.0		MCPA <sup>7</sup>	0.10			
Chromium	0.05		Pentachlorophenol	0.06			
Cyanide	0.2		Picloram		0.19		
Dichlorobenzene, 1,2	0.2		Trifluralin		0.045		
Dichlorobenzene, 1,4	0.005						
Dichloroethane, 1,2		0.005					
Dichloroethylene, 1,1	0.014						
Dichloromethane	0.05						
Dichlorophenol, 2,4	0.9						
Fluoride <sup>1</sup>	1.5						
Haloacetic Acids <sup>6</sup>	0.080						
Lead <sup>2</sup>	0.01						
Mercury	0.001						
Microcystin-LR*	0.0015						
Monochlorobenzene	0.08						
Nitrate <sup>3</sup> as NO <sub>3</sub>	45						
Selenium	0.01						
Tetrachlorophenol, 2,3,4,6	0.1						
Trichloroethylene	0.05						
Trichlorophenol, 2,4,6	0.005						
Trihalomethanes* (THM) <sup>4</sup>	0.100						
Uranium	0.02						
Vinyl Chloride	0.002						

<sup>1</sup> Maximum allowable concentration of naturally occurring fluoride in a treated drinking water intended or used for human consumptive use.

<sup>2</sup> Faucets should be thoroughly flushed before sample is collected.

<sup>3</sup> Nitrate levels in excess of 45 mg/L (10 mg/L as nitrate-nitrogen) may cause adverse health effects in infants less than six months old. Where nitrate and nitrite are determined separately, levels of nitrite should not exceed 3.2 mg/L.

<sup>4</sup> Based on an annual average of 4 seasonal samples.

<sup>5</sup> 2,4 Dichlorophenoxyacetic Acid

<sup>6</sup> Total of monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid and dibromoacetic acid and is based on a locational running average of quarterly samples taken from water mains within the distribution system.

<sup>7</sup> 2-Methyl-4-Chlorophenoxyacetic Acid

<sup>8</sup> Water samples may be initially screened for radioactivity using gross alpha and gross beta activity determinations. Compliance with the standards may be inferred if the measurements for gross alpha and gross beta activity are less than 0.5 Bq/L and 1.0 Bq/L, respectively, as these are lower than the strictest MACs. If these values are exceeded then Table 3 of the *Guidelines for Canadian Drinking Water Quality - Summary Table*, Health Canada (August 2012), as amended from time to time, applies.

## Objectives

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 objectives is not mandatory as these objectives are in the range where they do not constitute a health hazard. However, these substances may represent a health risk to some people if found in excessive concentrations. The Aesthetic Objectives for several parameters (including hardness as CaCO<sub>3</sub>, magnesium, sodium and total dissolved solids) consider regional differences in drinking water quality.

Physical		Chemical	
Parameter	AO	Parameter	AO (mg/L)
Color	15 ACU	Alkalinity (as CaCO <sub>3</sub> )	500
Odor	Inoffensive	Chloride	250
PH	6.5 to 9.0	Copper	1
Taste	Inoffensive	Ethylbenzene	0.0024
Temperature	<15°C	Hardness (as CaCO <sub>3</sub> )	800
		Iron	0.3
		Magnesium	200
		Manganese	0.05
		Sodium <sup>1</sup>	300
		Sulphate <sup>2</sup>	500
		Sulphite (as H <sub>2</sub> S)	0.05
		Total Dissolved Solids	1500
		Toluene	0.024
		Xylenes	0.3
		Zinc	5

<sup>1</sup> Sodium: It is recommended sodium be included in routine monitoring programmes. Sodium levels may be of interest to authorities who wish to prescribe sodium-restricted diets to their patients.

<sup>2</sup> Sulphate: There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.