

Test	Typical Ranges/Thresholds for Sampling Region
pH	7.2 to 9.6 ¹
Turbidity	<25 NTU ²
Dissolved Oxygen	>5.0 mg/l ³
Total Phosphate	<0.075 mg/l(WDNR threshold) ⁴
Un-ionized Ammonia (NH ₃)	<0.1-mg/l ⁵
Total Ammonia Nitrogen (NH ₃ + NH ₄)	See footnotes ⁶
<i>E coli</i>	Advisory: >235 Closed: >1000

Notes:

¹pH average range based on data collected between 2014-2019. pH tends to be alkaline in the sampling region due to the underlying bedrock (Niagara dolomite), which is a calcareous rock)

²Based on MN Pollution Control Agency Surface water standards:

Classes (and descriptions)	Turbidity (NTU)
1B (drinking water)	10
2A (cold water fishery, all recreation)	10
2B (cool/warm water fishery, all recreation)	25
2C (indigenous fish, most recreation)	25

³Dissolved oxygen can vary widely based on temperature, aeration, and biological processes such as photosynthesis, respiration, and decomposition. Generally, a diverse range of freshwater organisms will thrive at levels above 5 mg/L. Wisconsin Administrative Code NR102.04(4)(a) sets 5 mg/L as the standard for surface waters for waters classified for fish and aquatic life “except for natural conditions”.

[https://docs.legis.wisconsin.gov/document/administrativecode/NR%20102.04\(4\)\(a\)\)](https://docs.legis.wisconsin.gov/document/administrativecode/NR%20102.04(4)(a)))

⁴Wisconsin Administrative Code NR 102.06(3)(b):

[https://docs.legis.wisconsin.gov/document/administrativecode/NR%20102.06\(3\)\(b\)\)](https://docs.legis.wisconsin.gov/document/administrativecode/NR%20102.06(3)(b)))

The 2013 EPA guidelines for ammonia have been revised to reflect the variability present in ammonia toxicity.

- Un-ionized ammonia standards vary by state, and are not specified for Wisconsin; however, Minnesota’s standards range from 0.016-0.04 mg/l, and Illinois’s standard is

0.1 mg/l (<https://www.epa.gov/wqs-tech/state-specific-water-quality-standards-effective-under-clean-water-act-cwa>)

- TAN toxicity is affected by pH, and less significantly, temperature. In 2013, the EPA updated its criteria for TAN at 20C and pH 7.0, but has not updated its criteria for more alkaline pH. TAN thresholds are lower at a more alkaline pH. A summary table below gives examples of the range of criteria. More detailed discussion is available at the source for this table (<https://www.epa.gov/sites/production/files/2015-08/documents/aquatic-life-ambient-water-quality-criteria-for-ammonia-freshwater-2013.pdf>)

Criterion Duration	1999 AWQC Update Criteria Magnitude		2009 Draft AWQC Update Criteria ^c Magnitude		2013 AWQC Update Criteria Magnitude
	pH 8.0, (mg TAN/L)	pH 7.0, T=20°C (mg TAN/L)	pH 8.0, T=25°C (mg TAN/L)	pH 7.0, T=20°C (mg TAN/L)	pH 7.0, T=20°C (mg TAN/L)
Acute (1-hr average)	5.6 ^a	24 ^a	2.9	19	17 ^a
Chronic (30-d rolling average)	1.2	4.5 ^b	0.26	0.91	1.9*
*Not to exceed 2.5 times CCC or 4.8 mg TAN/L (at pH 7, 20°C) as a 4-day average within the 30-days, more than once in three years on average.					
Criteria frequency: Not to be exceeded more than once in three years on average.					

^a Salmonids present

^b Based on renormalization of data to pH 7 and 20°C

^c Mussels present