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The reader should consult the water quality standards of a particular State for exact regulatory language applicable to that State. Copies of State water quality standards may be obtained from the State's Water Pollution Control Agency or its equivalent.

Additional information may also be obtained from the:

Standards Branch
Criteria and Standards Division (WH-585)
Office of Water Regulations and Standards
U.S. Environmental Protection Agency
Washington, D.C. 20460
202-475-7315

This document may be obtained only from the National Technical Information Service (NTIS) at the following address:

National Technical Information Service
5285 Front Royal Road
Springfield, Virginia 22161
703-487-4650

The NTIS order number is: PB89-141618.

INTRODUCTION

This digest is compiled to provide general information to the public as well as to Federal, State, and local officials. It contains excerpts from the individual Federal-State water quality standards establishing pollutant specific criteria for interstate surface waters. The water quality standards program is implemented by the U. S. Environmental Protection Agency where responsibility for providing water quality recommendations, approving State-adopted standards for interstate waters, evaluating adherence to the standards, and overseeing enforcement of standards compliance, has been mandated by Congress.

Standards, a nationwide strategy for surface water quality management, contain three major elements: the use (recreation, drinking water, fish and wildlife propagation, industrial, or agricultural) to be made of the navigable water; criteria to protect these uses; and an antidegradation statement to protect existing high quality waters, from degradation by the addition of pollutants. Guidance for the development of standards by individual States is contained in two EPA documents entitled Water Quality Standards Handbook (1983) and Quality Criteria for Water (1986).

Criteria for ammonia, nitrate or nitrite nitrogen in State water quality standards are the subject of this digest. Ammonia in most waters is a biological degradation product of nitrogenous organic matter. When dissolved in water, ammonia will react with the water to form ammonium ions. Ammonium can also be released for proteinaceous organic matter and urea, or synthesized from nitrogen fixation. Nitrate is formed from the complete oxidation of ammonium by certain micro organisms in which nitrite is an intermediate product. In well oxygenated waters nitrite is readily oxidized to nitrate. The rationale for establishing water quality criteria for these three common molecular forms of nitrogen are:

- (1) ammonia toxicity to aquatic life is well documented and its toxicity is directly dependent on the pH of the water in which it is dissolved;
- (2) growing plants assimilate nitrate and ammonium ions into plant proteins; and
- (3) both nitrate and nitrite nitrogen are toxic to aquatic life where specific concentrations of either are reached in a waterbody.

To prevent the nuisance and toxic effects of any of the nitrogen forms, the 1986 Quality Criteria for Water recommends the following criteria:

Ammonia - Except where a locally important species is very sensitive, freshwater aquatic organisms and their uses should not be affected unacceptably is:

- (1) the 1-hour^{*} average concentration of un-ionized ammonia (in mg/L NH₃) does not exceed, more often than once every 3 years on the average, the numerical value given by $0.52/FT/FPH/2$, where:

$$FT = 10 - 0.03(20 - TCAP); TCAP \leq T \leq 30$$

$$10 - 0.03(20 - T); 0 \leq T \leq \text{TCAP}$$

$$\text{FPH} = 1; 8 < \text{pH} < 9$$

$$\frac{1 + 10 - 7.4 - \text{pH}}{1.25}; 6.5 < \text{pH} < 8$$

TCAP = 20°C; Salmonids or other sensitive coldwater species present

TCAP = 25°C; Salmonids and other sensitive coldwater species absent

* An average period of 1 hour may not be appropriate if excursions of concentrations to greater than 1.5 times the average occur during the hour; in such cases, a shorter averaging period may be needed.

(2) The 4-day average concentration of un-ionized ammonia (in mg/L NH₃) does not exceed, more often than once every 3 years on the average, the average numerical value given by 0.80/FT/FPH/RATIO, where FT and FPH are as above and:

$$\begin{aligned} \text{RATIO} &= 16; 7.7 \leq \text{pH} \leq 9 \\ &= 24; \frac{10 - 7.7 - \text{pH}}{1 + 10 - 7.4\text{pH}}; 6.5 \leq \text{pH} \leq 7.7 \end{aligned}$$

TCAP = 15°C; Salmonids or other sensitive coldwater species present

= 20°C; Salmonids or other sensitive coldwater species absent

* Because these formulas are non linear in pH and temperature, the criterion should be the average of separate evaluations of the formulas reflective of the fluctuations of flow, pH, and temperature within the averaging period; it is not appropriate in general to simply apply the formula to average pH, temperature, and flow.

Nitrates/Nitrites

10 mg/L nitrate nitrogen (N) for domestic water supply (health).

Since water quality standards experience revisions and upgrading from time to time, following procedures set forth in the Clean Water Act, individual entries in this digest may be superseded. As these revisions are accomplished and allowing for the States to revise their standards accordingly, this digest will be updated and reissued. Because this publication is not intended for use other than as a general information resource, to obtain the latest information and for special purposes and applications, the reader needs to refer to the current approved water quality standards. These can be obtained from the State water pollution control agencies of the EPA or Regional Offices.

REFERENCES

- 3 Water Quality Boundaries and Standards (Arizona), Article 2. Surface Water Quality Standards, A.R.S R18.11, 1987.
- 5 California Water Quality Standards by River Basins, ca. 1975

For more detailed information on selected basins, sub-basins and stretches of streams and coastal areas refer to California State Water Quality Standards.
- 9 Florida Administrative Code, Chapter 17-4, 1987 and Florida Administrative Code, Chapter 17-3, 1988.
- 11 Hawaii Administrative Rules, Title II, Hawaii Department of Health, Chapter 54: Water Quality Standards, 1988.
- 12 Idaho Department of Health and Welfare Rules and Regulations, Title 1, Chapter 2, "Water Quality Standards and Wastewater Treatment Requirements", 1980.
- 13 Illinois Pollution Control Board, Board Order R87-27, 1988
- 25 Missouri Water Quality Standards, 10 CSR 20-7.031, Rule of Department of Natural Resources: Division 20 - Clean Water Commission.
- 27 Nebraska Water Quality Standards, Title 117, Chapter 1, Nebraska Department of Environmental Control.
- 35 Ohio Water Quality Standards, Chapter 3745-1 of the Administrative Code, Ohio Environmental Protection Agency, 1985.
- 38 Pennsylvania Water Quality Standards, Department of Environmental Resources, Title 25. Part 1. Subpart C. Article II. Chapter 93 of Pennsylvania Code.
- 43 Texas Surface Water Quality Standards, Texas Water Commission, Rule Change, 1988.
- 44 Utah Standards of Quality for Waters of the State, Wastewater Disposal Regulations: Part II, State of Utah Department of Health: Division of Environmental Health, 1988.
- 48 Water Quality Standards, West Virginia Legislative Rules, State Water Resources Board, 1985.
- 51 Water Quality Standards for American Samoa, 1984, pp. 20-25.
- 53 Revised Guam Water Quality Standards, Guam Environmental Protection Agency, 1984, p. 9.

- 54 Commonwealth of Northern Mariana Islands Marine and Fresh Water Quality Standards, Commonwealth Register, Vol. 8 No. 5, 1986, p. 4465.
- 55 Puerto Rico Water Quality Standards Regulation, Environmental Quality Board, 1983.
- 56 Marine and Fresh Water Quality Standard Regulations, Trust Territory, 1986, p. 6.

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- 4 Pages 716:1005, August 30, 1985
- 6 Page 726:1011, August 22, 1986
- 8 Pages 736:1002, :1010, March 28, 1986
- 9 Pages 746:1010.3 - 1014, December 27, 1985
- 14 Pages 771:1006, :1008 - :1018, November 29, 1985
- 15 Pages 776:1005 - 1006, December 26, 1986
- 16 Page 781:1011 - 1012, March 27, 1987
- 17 Page 786:1008 - 1010, November 29, 1985
- 18 Page 791:1006, January 18, 1985
- 21 Pages 806:1003 - 1004, June 21, 1985
- 22 Page 811:1004, February 13, 1987
- 23 Page 816:1006 - 1008, June 25, 1982
- 28 Page 841:1013, February 22, 1985
- 30 Pages 851:1006, :1010, April 11, 1986
- 31 Pages 856:1010 - 1011, June 11, 1982
- 32 Pages 861:1015, :1024 - :1025, November 29, 1985
- 33 Page 866:1011, August 29, 1986
- 34 Pages 871:1003 - 1006, June 7, 1985
- 36 Pages 881:1003, :1008, September 26, 1986
- 39 Pages 901:1002 - 1005, August 9, 1985

40 Pages 906:1006, :1008, November 29, 1985

41 Pages 911:1004 - 1007, March 22, 1985

45 Page 931:1005, March 22, 1985

46 Page 936:1006.4, February 28, 1986

49 Page 951:1007, December 14, 1984

50 Page 956:1005, July 5, 1985

State and Water UseCriteria Values**Alabama¹**

All Not specified

Alaska²

All Not specified

Arizona³

Numeric nutrient standards for total nitrogen (mg/L) for certain surface water segments as adopted by the Council are as follows:

Verde River and 1.00 - annual mean
Tributaries to 1.50 - 90 percentile
Bartlett Lake 3.00 - single sample maximum

White River, Black 0.50 - annual mean
River, Tonto Creek 1.00 - 90 percentile
and Tributaries 2.00 - single sample maximum

Salt River and 0.60 - annual mean
Tributaries, except 1.20 - 90 percentile
Pinal Creek and 2.00 - single sample maximum
Tributaries, from
confluence of White and
Black Rivers to Theodore
Roosevelt Lake

Apache, Canyon, Saguaro 0.30 - Annual mean of representative
and Theodore Roosevelt composite samples (taken from
Lakes surface and 2 and 5 meter depths).

1.00 - Maximum for any set of representative composite samples (taken from surface and 2 and 5 meter depths).

Salt River below 0.60 - annual mean
Steward Mountain Dam 3.00 - single sample maximum
to above mouth of
Verde River

Little Colorado River 0.60 - annual mean
and Tributaries above 0.75 - 90 percentile
River Reservior in 1.10 - single sample maximum
Greer, South Fork of
Little Colorado above
South Fork Campground;
Water Canyon Creek
above Apache-Sitgreaves
National Forest boundry

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Little Colorado River
at Apache County Road
No. 124 crossing 1.80 - single sample maximum

Little Colorado River
above Lyman Lake to
above Amity Ditch
diversion near Arizona
Highway 273 crossing
(applies only when in-
stream turbidity is less
than 50 Nephelometric
Turbidity Units).
0.70 - annual mean
1.20 - 90 percentile
1.50 - single sample maximum

Oak Creek Canyon and
the West Fork 1.00 - annual mean
1.50 - 90 percentile
2.50 - single sample maximum

Arkansas⁴

All Not specified

Nutrients - Materials stimulating algal growth shall
not be present in concentrations sufficient to cause
objectionable algal densities or other nuisance
aquatic vegetation.

California⁵

All Nitrates + total nitrites
10

Livestock Watering
(Basin 3) 100

All Ammonia - Not specified

All Un-ionized ammonia - some basins

Note: See California State Water Standards for
specific rivers, basins and coastal waters.

Colorado⁶

Aquatic Life Class 1
Cold Water Biota
Un-ionized Ammonia (mg/l as N)
Chronic = 0.02
Acute = $0.43/FT/FP/2^{(4)}$

Nitrite⁽⁵⁾ - established on case-by-case basis.

<u>State and Water Use</u>	<u>Criteria Values</u>
Life Class 1 Warm Water Biota	<u>Un-ionized Ammonia (mg/l as N)</u> Chronic = 0.06 Acute = $0.62/FT/FP/2^{(4)}$ Nitrite ⁽⁵⁾ - established on case-by-case basis.
Aquatic Life Class 2	<u>Un-ionized Ammonia (mg/l as N)</u> Acute = see note (1) Chronic = 0.02 (cold water) 0.06 - 0.10 ⁽¹⁾ (warm water)
Drinking Water Supply	<u>Un-ionized Ammonia (mg/l as N)</u> $0.5^{(2)}$ 30-day avg. Nitrite - $1.0^{(2)(6)}$ 1-day avg. Nitrate - $10^{(6)}$ 1-day avg.
Agriculture	Nitrite - $10^{(3)}$ 1-day avg. Nitrate - $100^{(3)}$

(1) For class 2 warm water aquatic life segments, where table value standards are to be applied, a specific chronic standard in the 0.06 to 0.10 mg/l range for un-ionized ammonia shall be selected based upon the aquatic life present or to be protected and whether the waters have been adversely impacted by factors other than ammonia. The Commission may consider a standard higher than 0.08 mg/l un-ionized ammonia where a higher risk of sublethal effects is justified by habitat limitations or other water quality factors. Where a site-specific study has been conducted, the Commission may apply appropriate alternative chronic standards in accordance with section 3.1.7(1)(b)(iii). Acute standards for cold and warm water class 2 segments generally shall be established at the respective levels listed in table II for class 1 segments, except where site-specific information submitted justifies an alternative acute standard.

(2) To be applied at the point of water supply intake.

(3) In order to provide a reasonable margin of safety to allow for unusual situations such as extremely high water ingestion or nitrite formation in slurries, the NO_3-N plus NO_2-N content in drinking waters for livestock and poultry should be limited to 100 ppm or less, and the NO_2-N content alone be limited to 10 ppm or less.

(4) $FT = 10^{0.03(20-TCAP)}$; $TCAP \leq T \leq 30$
 $FT = 10^{0.03(20-T)}$; $0 \leq T \leq TCAP$
 $TCAP = 20^\circ C$ cold water aquatic life species present
 $TCAP = 25^\circ C$ cold water aquatic life species absent

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$$\begin{aligned} \text{FPH} &= 1; 8 \leq \text{pH} \leq 9 \\ \text{FPH} &= \frac{1+10^{(7.4-\text{pH})}}{1.25}; 6.5 \leq \text{pH} \leq 8 \end{aligned}$$

FPH means the acute pH adjustment factor, defined by the above formulas.

FT means the acute temperature adjustment factor, defined by the above formulas.

T means temperature measured in degrees Celsius.

TCAP means temperature CAP; the maximum temperature which affects the toxicity of ammonia to salmonid and non-salmonid fish groups.

Note: If the calculated acute value is less than the calculated chronic value, then the calculated chronic value shall be used as the acute value.

Connecticut⁷

Not specified

Delaware⁸

Not specified

Nutrients - Nutrient overenrichment is recognized as a significant problem in the surface waters of the State. It shall be the policy of this Department to minimize nutrient input to surface waters from any controllable source. The types of and need for nutrient controls shall be established on a site-specific basis. Practices may include discharge limitations, institution of best management practices, or other measures.

Point and non-point source discharges shall not contain those nutrients expected to cause excessive growth of photosynthetic organisms, in concentrations exceeding those representative of local baseflow or shallow groundwater conditions.

Florida⁹

All

Man-induced nutrient enrichment (total nitrogen or total phosphorus) shall be considered degradation in relation to the provisions of section 17-3.041 and section 17-4.242, F.A.C.

Potable Water
Supply, Surface
Waters

Nitrate - 10.0 mg/L as N or that determined in Nutrients.

Nutrients - In no case shall nutrient concentrations

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of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora and fauna.

Ammonia(unionized) - shall not exceed 0.02 mg/L.

Shellfish Propagation
or Harvesting,
Surface Waters

Nutrients - In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora and fauna.

Recreation, Surface
Waters

Ammonia(unionized) - shall not exceed 0.02 mg/L in predominantly fresh waters.

Nutrients - In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora and fauna.

Georgia¹⁰

Not specified

Hawaii¹¹

Streams

Total Nitrogen (N/L):

Geometric Mean should not exceed 0.25 mg/L in the wet season (Nov. 1 to Apr. 30) and 0.18 mg/L in the dry season (May 1 to Oct. 31).

Single value not to exceed 0.52 mg/L in the wet season and 0.38 mg/L in the dry season more than 10% of the time.

Single value not to exceed 0.80 mg/L in the wet season and 0.06 mg/L in the dry season more than 2% of the time.

Nitrate + Nitrite ([NO₃ + NO₂] - N/L):

Geometric Mean should not exceed 0.07 mg/L.

Single value not to exceed 0.18 mg/L more than 10% of the time.

Single value not to exceed 0.30 mg/L more than 2% of the time.

Estuaries
(except Pearl Harbor)

Total Nitrogen (N/L):

Geometric Mean should not exceed 0.20 mg/L.

Single value not to exceed 0.35 mg/L more than 10% of the time.

Single value not to exceed 0.50 mg/L more than 2% of the time.

Nitrate + Nitrite ([NO₃ + NO₂] - N/L):

Geometric Mean should not exceed 0.008 mg/L.

Single value not to exceed 0.025 mg/L more than 10% of

State and Water Use

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the time.

Single value not to exceed 0.035 mg/L more than 2% of the time.

Ammonia Nitrogen ($\text{NH}_4\text{-N/L}$):

Geometric Mean should not exceed 0.006 mg/L.

Single value not to exceed 0.010 mg/L more than 10% of the time.

Single value not to exceed 0.020 mg/L more than 2% of the time.

Pearl Harbor Estuary

Total Nitrogen (N/L):

Geometric Mean should not exceed 0.30 mg/L.

Single value not to exceed 0.55 mg/L more than 10% of the time.

Single value not to exceed 0.75 mg/L more than 2% of the time.

Nitrate + Nitrite ($[\text{NO}_3 + \text{NO}_2] - \text{N/L}$):

Geometric Mean should not exceed 0.015 mg/L.

Single value not to exceed 0.040 mg/L more than 10% of the time.

Single value not to exceed 0.070 mg/L more than 2% of the time.

Ammonia Nitrogen ($\text{NH}_4\text{-N/L}$):

Geometric Mean should not exceed 0.010 mg/L.

Single value not to exceed 0.020 mg/L more than 10% of the time.

Single value not to exceed 0.030 mg/L more than 2% of the time.

Embayments

Total Nitrogen (N/L):

Geometric Mean should not exceed 0.20 mg/L in the wet season* and 0.15 mg/L in the dry season**.

Single value not to exceed 0.35 mg/L in the wet season* and 0.25 mg/L in the dry season** more than 10% of the time.

Single value not to exceed 0.50 mg/L in the wet season* and 0.35 mg/L in the dry season** more than 2% of the time.

Ammonia Nitrogen ($\text{NH}_4\text{-N/L}$):

Geometric Mean should not exceed 0.006 mg/L in the wet season* and 0.0035 mg/L in the dry season**.

Single value not to exceed 0.013 mg/L in the wet season* and 0.0085 mg/L in the dry season** more than 10% of the time.

Single value not to exceed 0.020 mg/L in the wet season* and 0.015 mg/L in the dry season** more than 2% of the time.

Nitrate + Nitrite ($[\text{NO}_3 + \text{NO}_2] - \text{N/L}$):

Geometric Mean should not exceed 0.008 mg/L in the wet

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season* and 0.005 mg/L in the dry season**.

Single value not to exceed 0.02 mg/L in the wet season* and 0.014 mg/L in the dry season** more than 10% of the time.

Single value not to exceed 0.035 mg/L in the wet season* and 0.025 mg/L in the dry season** more than 2% of the time.

* "Wet" criteria apply when the average fresh water inflow from the land equals or exceeds 1% of the embayment volume per day.

** "Dry" criteria apply when the average fresh water inflow from the land is less than 1% of the embayment volume per day.

Applicable to both "wet" and "dry" conditions:

pH Units shall not deviate more than 0.5 units from a value of 8.1.

Temperature - Shall not vary more than 1°C from ambient conditions.

Salinity (ppm) - Shall not vary more than 10% from natural or seasonal changes considering hydrologic input and oceanographic factors.

Open Coastal Waters

Total Nitrogen (N/L):

Geometric Mean should not exceed 0.15 mg/L in the wet season* and 0.11 mg/L in the dry season**.

Single value not to exceed 0.25 mg/L in the wet season* and 0.18 mg/L in the dry season** more than 10% of the time.

Single value not to exceed 0.35 mg/L in the wet season* and 0.25 mg/L in the dry season** more than 2% of the time.

Ammonia Nitrogen (NH₄-N/L):

Geometric Mean should not exceed 0.0035 mg/L in the wet season* and 0.002 mg/L in the dry season**.

Single value not to exceed 0.0085 mg/L in the wet season* and 0.005 mg/L in the dry season** more than 10% of the time.

Single value not to exceed 0.015 mg/L in the wet season* and 0.009 mg/L in the dry season** more than 2% of the time.

Nitrate + Nitrite ([NO₃ + NO₂] - N/L):

Geometric Mean should not exceed 0.005 mg/L in the wet season* and 0.0035 mg/L in the dry season**.

Single value not to exceed 0.014 mg/L in the wet season* and 0.010 mg/L in the dry season** more than 10% of the time.

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Single value not to exceed 0.025 mg/L in the wet season* and 0.020 mg/L in the dry season** more than 2% of the time.

* "Wet" criteria apply when the open coastal waters receive more than three million gallons per day of fresh water discharge per shoreline mile.

** "Dry" criteria apply when the open coastal waters receive less than three million gallons per day of fresh water discharge per shoreline mile.

Applicable to both "wet" and "dry" conditions:

pH Units shall not deviate more than 0.5 units from a value of 8.1.

Temperature - shall not vary more than 1°C from ambient conditions.

Salinity (ppm) - shall not vary more than 10% from natural or seasonal changes considering hydrologic input and oceanographic factors.

Oceanic Waters

Total Nitrogen (N/L):

Geometric Mean should not exceed 0.050 mg/L.

Single value not to exceed 0.080 mg/L more than 10% of the time.

Single value not to exceed 0.100 mg/L more than 2% of the time.

Nitrate + Nitrite ([NO₃ + NO₂] - N/L):

Geometric Mean should not exceed 0.0015 mg/L.

Single value not to exceed 0.0025 mg/L more than 10% of the time.

Single value not to exceed 0.0035 mg/L.

Ammonia Nitrogen (NH₄-N/L):

Geometric Mean should not exceed 0.001 mg/L.

Single value not to exceed 0.00175 mg/L more than 10% of the time.

Single value not to exceed 0.0025 mg/L more than 2% of the time.

State and Water UseCriteria ValuesIdaho¹²

Warm Water Biota Concentrations of Total Ammonia Not to Exceed: (3-3-87)

The following daily maximum concentrations for the specific temperature and pH conditions indicated:

pH/Temp.	5°C	10°C	15°C	20°C
7.00	26	25	24	23
7.25	22	20	19.7	19.2
7.50	16.3	15.5	14.9	14.6
7.75	11.4	10.9	10.5	10.3
8.00	7.5	7.1	6.9	6.8

Maximum allowable Concentrations of Total Ammonia (mg/l NH₃) (3-3-87)

ii. The following weekly average concentrations for the specific conditions indicated:

pH/Temp.	5°C	10°C	15°C	20°C
7.00	2.4	2.2	2.2	2.1
7.25	2.4	2.2	2.2	2.1
7.50	2.4	2.2	2.2	2.1
7.75	2.2	2.1	2.0	1.98
8.00	1.44	1.37	1.33	1.31

Maximum allowable Concentrations of Total Ammonia (mg/l NH₃) (3-3-87)

iii. Where pH and temperature conditions fall outside the pH and temperature ranges listed in Idaho Department of Health and Welfare Rules and Regulations Sections 01.2250, 03.e.1. and ii., the allowable daily maximum and weekly average concentrations of total ammonia shall be those values specified for other specific pH and temperature conditions in EPA's "Ambient Water Quality Criteria for Ammonia - 1984", EPA document number 440/5-85-001 dated January 1985. Copies of EPA's "Ambient Water Quality Criteria for Ammonia - 1984" may be obtained by requesting document number PB85-227114 from the National Technical

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Information Service, 5285 Port Royal Road,
Springfield, Virginia 22161. (3-3-87)

Cold Water Biota and Salmonid Spawning Weekly Average
Concentrations of Total Ammonia Not to Exceed:
(3-3-87)

ii. The following weekly average concentrations for
the specific pH and temperature conditions
indicated: (3-3-87)

pH/Temp.	5°C	10°C	15°C	20°C
7.00	2.4	2.2	2.2	1.49
7.25	2.4	2.2	2.2	1.50
7.50	2.4	2.2	2.2	1.50
7.75	2.2	2.1	2.0	1.40
8.00	1.44	1.37	1.33	0.93

Maximum allowable Concentrations of Total Ammonia
(mg/l NH₃) (3-3-87)

Illinois¹³

General Use Water

Ammonia Nitrogen and Un-ionized Ammonia:

a) Ammonia nitrogen (as N: Storet Number 31616) shall
in no case exceed 15 mg/L.

b) If ammonia nitrogen is less than 15 mg/L and
greater than or equal to 1.5 mg/L, then un-ionized
ammonia (as N) shall not exceed 0.04 mg/L.

c) Ammonia nitrogen concentrations of less than 1.5
mg/L are lawful regardless of un-ionized ammonia
concentration.

d) For purposes of this section the concentration of
un-ionized ammonia shall be computed according to the
following equation:

$$U = \frac{1.0013 N}{(1 + 10^{\bar{X}})} \quad \text{where:}$$

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$$X = \frac{0.09018 + 2729.92}{(T + 273)} - \text{pH}$$

U = Concentration of un-ionized ammonia as N in mg/L

N = Concentration of ammonia nitrogen as N in mg/L

T = Temperature in degrees Celcius

e) The following table indicates the maximum ammonia nitrogen concentrations allowable for certain combinations of pH and temperature:

AMMONIA NITROGEN
WATER QUALITY STANDARD (mg/L)

Temp	pH						
$^{\circ}\text{C} (^{\circ}\text{F})$	6.0	6.5	7.0	7.5	8.0	8.5	9.0
5 (41)	15	15	15	9.6	3.1	1.5	1.5
10 (50)	15	15	15	6.5	2.1	1.5	1.5
15 (59)	15	15	13.9	4.4	1.5	1.5	1.5
20 (68)	15	15	9.6	3.1	1.5	1.5	1.5
25 (77)	15	15	6.7	2.1	1.5	1.5	1.5
30 (86)	15	14.9	4.7	1.5	1.5	1.5	1.5
35 (95)	15	10.7	3.4	1.5	1.5	1.5	1.5

Public and Food
Processing

Nitrate-Nitrogen - 10.0 mg/L (storet number 00620).

Secondary Contact and
Indigenous Aquatic
Life

Ammonia, unionized (as N) (storet number 00619):
0.1 mg/L

Lake Michigan

Ammonia Nitrogen - 0.02 mg/L (storet number 00610)

Indiana¹⁴

Ohio River Main Stem
and Interstate Portion
of the Wabash River

Ammonia (un-ionized) - 0.05 mg/L
Nitrite-N - 1.0 mg/L
Nitrate-N + Nitrite-N - 10.0 mg/L

Inner Harbor, Gary
Harbor and Burns
Harbor

Un-ionized Ammonia:
Monthly Average - 0.03 mg/L
Daily Max. - 0.10 mg/L

Lake Michigan

Un-ionized Ammonia:
Monthly Average - 0.02 mg/L
Daily Maximum - 0.05 mg/L

State and Water UseCriteria Values

Grand Calumet River
West Branch

Ammonia (un-ionized as $\text{NH}_3\text{-N}$) - 0.05 mg/L

East Branch including
Indiana Harbor Ship
Canal

- 0.02 mg/L

Natural Spawning,
Rearing or Imprinting
Areas; Migration
Routes for Salmonid
Fishes

Toxic Substances - The concentration of toxic and/or
bioconcentrating substances shall not exceed the
values listed in the following table:

Maximum Ammonia Concentrations
(Un-ionized Ammonia as N)***

(mg/L)

Temperature ($^{\circ}\text{C}$)

pH	0	5	10	15	20	25	30
6.5	.0075	.0106	.0105	.0211	.0299	.0299	.0299
6.6	.0092	.0130	.0183	.0259	.0365	.0365	.0365
6.7	.0112	.0158	.0223	.0315	.0444	.0444	.0444
6.8	.0135	.0190	.0269	.0380	.0536	.0536	.0536
6.9	.0161	.0228	.0322	.0454	.0642	.0642	.0642
7.0	.0191	.0270	.0381	.0539	.0761	.0761	.0761
7.1	.0244	.0316	.0447	.0631	.0892	.0892	.0892
7.2	.0260	.0367	.0518	.0732	.1034	.1034	.1034
7.3	.0297	.0420	.0593	.0837	.1183	.1183	.1183
7.4	.0336	.0474	.0669	.0946	.1336	.1336	.1336
7.5	.0374	.0528	.0746	.1054	.1489	.1489	.1489
7.6	.0411	.0581	.0821	.1160	.1638	.1638	.1638
7.7	.0447	.0631	.0892	.1260	.1780	.1780	.1780
7.8	.0480	.0678	.0958	.1353	.1911	.1911	.1911
7.9	.0510	.0720	.1017	.1437	.2030	.2030	.2030
8.0	.0536	.0758	.1070	.1512	.2135	.2135	.2135
8.1	.0537	.0758	.1071	.1513	.2137	.2137	.2137
8.2	.0537	.0758	.1071	.1513	.2137	.2137	.2137
8.3	.0537	.0758	.1071	.1513	.2137	.2137	.2137
8.4	.0537	.0758	.1071	.1513	.2137	.2137	.2137
8.5	.0537	.0758	.1071	.1513	.2137	.2137	.2137
8.6	.0537	.0758	.1071	.1513	.2137	.2137	.2137
8.7	.0537	.0758	.1071	.1513	.2137	.2137	.2137
8.8	.0537	.0758	.1071	.1513	.2137	.2137	.2137
8.9	.0537	.0758	.1071	.1513	.2137	.2137	.2137
9.0	.0537	.0758	.1071	.1513	.2137	.2137	.2137

*** To calculate total ammonia, divide the number in the
table by the value determined by:

$$1/(10^{\text{pKa}-\text{pH}} + 1)$$

State and Water UseCriteria Values

Where: $pK_a = 0.09018 + (2729.92 / (T + 273.2))$
 $pH = pH \text{ of water}$
 $T = ^\circ C$

24 Hour Average Ammonia Concentrations
(Un-ionized Ammonia as N)***
(mg/L)
Temperature ($^\circ C$)

pH	0	5	10	15	20	25	30
6.5	.0005	.0008	.0011	.0015	.0015	.0015	.0015
6.6	.0007	.0010	.0014	.0019	.0019	.0019	.0019
6.7	.0009	.0012	.0017	.0024	.0024	.0024	.0024
6.8	.0011	.0015	.0022	.0031	.0031	.0031	.0031
6.9	.0014	.0019	.0027	.0038	.0038	.0038	.0038
7.0	.0017	.0024	.0034	.0048	.0048	.0048	.0048
7.1	.0022	.0031	.0043	.0061	.0061	.0061	.0061
7.2	.0027	.0038	.0054	.0077	.0077	.0077	.0077
7.3	.0034	.0048	.0068	.0097	.0097	.0097	.0097
7.4	.0043	.0061	.0086	.0122	.0122	.0122	.0122
7.5	.0054	.0077	.0108	.0153	.0153	.0153	.0153
7.6	.0068	.0097	.0136	.0193	.0193	.0193	.0193
7.7	.0086	.0122	.0172	.0242	.0242	.0242	.0242
7.8	.0092	.0130	.0184	.0260	.0260	.0260	.0260
7.9	.0098	.0138	.0196	.0276	.0276	.0276	.0276
8.0	.0103	.0146	.0206	.0294	.0294	.0294	.0294
8.1	.0103	.0146	.0206	.0294	.0294	.0294	.0294
8.2	.0103	.0146	.0206	.0294	.0294	.0294	.0294
8.3	.0103	.0146	.0206	.0294	.0294	.0294	.0294
8.4	.0103	.0146	.0206	.0294	.0294	.0294	.0294
8.5	.0103	.0146	.0206	.0294	.0294	.0294	.0294
8.6	.0103	.0146	.0206	.0294	.0294	.0294	.0294
8.7	.0103	.0146	.0206	.0294	.0294	.0294	.0294
8.8	.0103	.0146	.0206	.0294	.0294	.0294	.0294
8.9	.0103	.0146	.0206	.0294	.0294	.0294	.0294
9.0	.0103	.0146	.0206	.0294	.0294	.0294	.0294

Iowa¹⁵

Class B

Ammonia Nitrogen (N):	Water B(W)	Uses B(C)
<hr/>		
November 1 to March 31	5 mg/L	2.5 mg/L
April 1 to October 31	2 mg/L	1.0 mg/L

Class C

Nitrate (as NO₃) - 45 mg/L

State and Water UseCriteria Values**Kansas¹⁶**

Aquatic Life

Un-ionized Ammonia - Artificial sources shall not cause the un-ionized ammonia concentrations of surface waters to exceed 0.07 mg/L as $\text{NH}_3\text{-N}$.

Domestic Water Supply

10.0 mg/L Nitrate (as N)

Kentucky¹⁷Warmwater Aquatic
Habitat, Coldwater
Aquatic Habitat

Ammonia - The concentration of the un-ionized form shall not be greater than 0.05 mg/L at any time in stream after mixing as illustrated in the table entitled "Instream Ammonia-N Concentrations," filed herein by reference. Copies may be obtained from the Division of Water, Fort Boone Plaza, 18 Reilly Road, Frankfort, Kentucky 40601.

Domestic Water Supply

Nitrate ($\text{NO}_3\text{-N}$, as Total) - 10 mg/L

Louisiana¹⁸

Not specified

Nutrients - The naturally occurring nitrogen-phosphorus ratio shall be maintained. Because regulation of nitrates and phosphates alone may not be adequate to protect waters from eutrophication, no substance shall be added to any surface water which produces aquatic growth to the extent that such growths create a public nuisance or interfere with designated water uses. Detailed studies of the naturally occurring levels of the various macro- and micronutrients will be utilized by the state to establish numerical limits for nutrients. This shall not apply to those waterbodies determined to be intermittent or man-made as defined in the Standards.

Maine¹⁹

Not specified

Maryland²⁰

Not specified

Massachusetts²¹

Class A

Nitrate shall not exceed 10 mg/L as nitrogen.

The discharge of nutrients, primarily phosphorus or nitrogen to surface waters will be limited or prohibited by the Division (Massachusetts Division of Water Pollution Control) as necessary to prevent excessive eutrophication of such waters. There shall

State and Water UseCriteria Values

be no new or increased discharges of nutrients into lakes and ponds, or tributaries thereto. Existing discharges containing nutrients which encourage eutrophication or growth of weeds or algae shall be treated. Activities which may result in non-point discharges of nutrients shall be conducted in accordance with the best management practices reasonably determined by the Division to be necessary to preclude or minimize such discharges of nutrients.

Michigan²²

Not specified

Nutrients shall be limited to the extent necessary to prevent stimulation of growths of aquatic rooted, attached, suspended, and floating plants, fungi or bacteria which are or may become injurious to the designated uses of the waters of the state.

Minnesota²³

Domestic Water Supply
Classes A, B, and C

Nitrates (NO₃) - 45.0 mg/L

Fisheries and Recr.
Class A

Ammonia (unionized as N) - 0.016 mg/L
The percent un-ionized ammoniac can be calculated for any temperature and pH by using the following formula taken from Thurston, R.V., R.C. Russo, and K. Emerson, 1974. Aqueous ammonia equilibrium calculations. Technical Report Number 74-1, Fisheries Bioassay Laboratory, Montana State University, Bozeman, MT. 18 p.

$$f = \frac{1}{10^{(pk_a - pH)} + 1} \times 100$$

where:

f = the percent of total ammonia in the unionized state.

pk_a = 0.0901821 + 2729.92/T, dissociation constant for ammonia.

T = temperature in degrees Kelvin (273.16° Kelvin = 0° Celcius)

Fisheries and Recr.
Class B and C

Ammonia (unionized as N) - 0.04 mg/L

Mississippi²⁴

Not specified

State and Water UseCriteria Values**Missouri**²⁵

Coldwater and Warm Water Fisheries Function of Temperature and pH - see Missouri Water Quality Standards page 7 - 8.

Drinking Water Supply Nitrate-Nitrogen - 10 mg/L

Whole-Body Contact Recreation Nitrate-Nitrogen - 10 mg/L

Montana²⁶ Not specified**Nebraska**²⁷

Public Drinking Water Nitrate-nitrogen (as N) - 10 mg/L
Agricultural Class A Nitrate and Nitrite (as N) - 100 mg/L
 Nitrite (as N) - 10 mg/L

Cold Water Habitat
 Class A Un-ionized Ammonia (as N) - 0.02 mg/L
 Class B Un-ionized Ammonia (as N) - 0.04 mg/L

Warm Water Habitat
 Class A Un-ionized Ammonia (as N) - 0.06 mg/L
 Class B Un-ionized Ammonia (as N) - 0.10 mg/L

Nevada²⁸

Various Control Point Locations Total Kjeldahl Nitrogen (as N)
 Annual Average - 0.29 to 1.25 mg/L
 Single Value - 0.36 to 2.67 mg/L

 Total Nitrate (as NO₃)
 Annual Average - 0.4 to 5.0 mg/L
 Single Value - 0.6 to 7.1 mg/L

 Total Nitrite (as NO₂)
 Annual Average - 0.011 to 0.090 mg/L
 Single Value - 0.017 to 0.220 mg/L

 Ammonia Nitrogen (unionized)
 Single Value - 0.016 mg/L

Single values and annual average values shown here represent the range of criteria presented for all control points (sampling sites) in Nevada. Please refer to tables in section 445.134

New Hampshire²⁹ Not specified

State and Water Use

Criteria Values

New Jersey³⁰

FW Nutrients - Except as due to natural conditions, nutrients shall not be allowed in concentrations that cause objectionable algal densities, nuisance aquatic vegetation, or otherwise render the waters unsuitable for the designated uses.

PL For Nitrate-Nitrogen a level of 2 mg/L shall be maintained in the surface waters unless it is shown that a lower level must be maintained to protect the existing surface water quality.

The criteria for Nitrate-Nitrogen and pH promulgated in N.J.A.C. 7:9-4.14(b)1 for PL waters apply instead of the 1981 criteria.

New Mexico³¹

Coldwater Fishery Un-ionized ammonia (as N) shall not exceed 0.03 mg/L.

Coldwater Fishery Un-ionized ammonia (as N) shall not exceed 0.2 mg/L.
(High Quality)

Total inorganic nitrogen (as N) shall not exceed 1.0 mg/L.

As the need arises, the State shall determine, for specified stream segments or relevant portions thereof, whether the limiting nutrient for the growth of aquatic plants is nitrogen or phosphorus. Upon such a determination, the waters in question shall be exempt from the standard for the nutrient found to be not limiting. Until such a determination is made, standards for both nutrients shall apply. If co-limitation is found, the waters in question shall be exempt from the total inorganic nitrogen standard. The State shall make available, upon request, a list of those waters for which the limiting nutrient has been determined.

New York³²

AA, AA-s, A, A-s Ammonia ($\text{NH}_3 + \text{NH}_4$ as N) - 2 mg/L
(Human)

Nitrate (as N) - 10 mg/L

State and Water UseCriteria Values

AA, AA-s, A, A-s
B, C
(Aquatic)

Nitrite - 0.10 mg/L in warm water
fishery waters

Nitrite - 0.02 mg/L in cold water fishery waters

AA, AA-s, A, A-s,
B, C

AWQC (mg/L) = $0.031[f(T)/g(pH)]$

T = temperature in °C

$g(pH) = 1$; if $pH \geq 7.7$

$g(pH) = 10^{[0.74(7.7 - pH)]}$; if $pH < 7.7$

$f(T) = 1$; if $T \geq 10^{\circ}C$

$f(T) = \frac{1 + 10(9.73 - pH)}{1 + 10^{(pK_T - pH)}}$; if $T < 10^{\circ}C$

$pK_T = 0.090 + 2730/(T + 273.2)$

AWQC (mg/L) = $0.15 [f(T) / g(pH)]$

$g(pH) = 1 + 10^{[1.03(7.32 - pH)]}$

f(T) as above

North Carolina³³

Class WS-II

Nitrate nitrogen - 10.0 mg/L

North Dakota³⁴

Class I, IA, II

Ammonia (unionized) as N (diss):

0.01 mg/L for no more than 5 days per 30 day period after acclimation. No concentrations greater than .02 mg/L will be permitted until the department has monitored chemical and physical parameters in the receiving water and its aquatic biota to ensure sensitive aquatic species are allowed to acclimate to increased un-ionized ammonia concentrations.

0.05 mg/L for no more than 20 days per 30 day period.

0.02 mg/L for any discharge continuing beyond 20 days.

Nitrates (N) (diss) - 1.0 mg/L

The standards for nitrates (N) and phosphates (P) are intended as interim guideline limits. Since each stream or lake has unique characteristics which determine the levels of these constituents that will

State and Water UseCriteria Values

cause excessive plant growth (eutrophication), the department reserves the right to review these standards after additional study and to set specific limitations on any waters of the state. However, in no case shall the standard for nitrates (N) exceed ten mg/L for any waters used as a municipal or domestic drinking water supply.

Class III Streams

Same as above except:

Ammonia (un-ionized) as N - 0.10 mg/L

More restrictive criteria than specified may be necessary to protect fish and aquatic biota. These criteria will be developed according to the procedures in subdivision B of subsection 2 of section 33-16-02-07 (Misc. Provisions).

All Lakes

Generally, the parameter limitations designated for Class I streams shall apply to all classified lakes.

NO₃ as N - 0.375 mg/L

Ohio³⁵Warmwater and
Exceptional Warmwater
Aquatic Life Habitat

30-day average Total Ammonia-Nitrogen Criteria:
varies depending on pH and Temperature (See Table 4 in Ohio Water Quality Standards).

Coldwater Aquatic
Life Habitat

30-day average Total Ammonia-Nitrogen Criteria:
varies depending on pH and Temperature (See Table 5 in Ohio Water Quality Standards).

Nuisance Prevention

Maximum Total Ammonia-Nitrogen Criteria: varies
depending on pH and Temperature (See Table 6 in Ohio Water Quality Standards).

Public Water Supply

Nitrate-N: 10 mg/l maximum

Agricultural Water
Supply

Nitrates + Nitrites: 100 mg/l maximum

Lake Erie

Ammonia: The concentration of un-ionized ammonia shall not exceed 0.025 mg/l; un-ionized ammonia shall be determined for values of total ammonia-N, pH and temperature using the following equation:

$$\text{Un-ionized ammonia} = 1.2 \frac{(\text{total ammonia-N})}{(1 + 10^{(\text{pKa} - \text{pH})})}$$

Where $\text{pKa} = 0.0902 + \frac{2730}{(273.2 + T)}$ and T = temperature in degrees C.

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At no time shall ammonia-N concentrations exceed 6.5 mg/l.

Nitrate-N: 10.0 mg/l

Nitrate and Nitrite: 100.0 mg/l

Ohio River

Ammonia: The concentration of un-ionized ammonia (NH_3) shall not exceed 0.05 mg/l; un-ionized ammonia shall be determined for values of total ammonia-N, pH and temperature using the following equation:

Un-ionized ammonia =
 $1.2 (\text{total ammonia-N}) (1 + 10^{(\text{pKa}-\text{pH})})$
Where $\text{pKa} = 0.0902 + 2730 / (273.2 + T)$ and $T =$
temperature in degrees C.

Nitrate-N + Nitrite-N: 10 mg/l

Nitrite-N: 1.0 mg/l

Oklahoma³⁶

Drinking Water

Nitrates as N - 10.0 mg/L

Fish and Wildlife

Total and Un-ionized Ammonia:
Concentrations of ammonia nitrogen containing un-ionized ammonia levels which are toxic to any species in the natural climax fish community in surface waters of the State shall not be allowed. Neither shall the concentration of ammonia nitrogen be allowed to deplete the concentration of dissolved oxygen below the appropriate standard. In cases where ammonia toxicity is suspected, the in-situ test described in subsection 7.3(i) (Toxicity to Aquatic Organisms) will be initiated with a sensitive indigenous species of fish.

Nitrites - Concentrations of nitrites which are toxic to any species in the natural climax fish community in surface waters of the State shall not be allowed. Neither shall the concentrations of nitrites be allowed to deplete the concentration of dissolved oxygen below the appropriate standard. In cases where nitrite toxicity is suspected, the testing procedures described under 7.3(i) shall apply.

Oregon³⁷

Not specified

Pennsylvania³⁸

All

Ammonia Nitrogen - The maximum total ammonia nitrogen concentration at all times shall be less than or equal to the numerical value given by:

un-ionized ammonia nitrogen ($\text{NH}_3\text{-N}$) $\times (\log^{-1}[\text{pK}_T\text{-pH}] + 1)$ where:

$$\text{un-ionized ammonia nitrogen} = \frac{0.12 \times f(T)}{f(\text{pH})}$$

$$f(\text{pH}) = 1 + 10^{1.03(7.32-\text{pH})}$$

$$f(T) = 1, \quad T \geq 10^\circ\text{C}$$

$$f(T) = \frac{1 + 10^{(9.73-\text{pH})}}{1 + 10^{(\text{pK}_T-\text{pH})}}, \quad T < 10^\circ\text{C}$$

$$\text{pK}_T = 0.090 + \frac{2730}{(T + 273.2)}$$

The dissociation constant for ammonia in water.

The average total ammonia nitrogen concentration over 30 consecutive days shall be less than or equal to the numerical value given by:

Un-ionized ammonia nitrogen ($\text{NH}_3\text{-N}$) $\times (\log^{-1}[\text{pK}_T\text{-pH}] + 1)$, where:

$$\text{un-ionized ammonia nitrogen} = 0.025 \times f(T)/f(\text{pH})$$

$$f(\text{pH}) = 1, \quad \text{pH} \geq 7.7$$

$$f(\text{pH}) = 10^{0.74(7.7-\text{pH})}, \quad \text{pH} < 7.7$$

$$f(T) = 1, \quad T \geq 10^\circ\text{C}$$

$$f(T) = \frac{1 + 10^{(9.73-\text{pH})}}{1 + 10^{(\text{pK}_T-\text{pH})}}, \quad T < 10^\circ\text{C}$$

The pH and temperature used to derive the appropriate ammonia criteria shall be determined by one of the following methods:

1) Instream measurements, representative of median pH and temperature - July through September.

2) Estimates of median pH and temperature - July

State and Water Use

Criteria Values

through September - based upon available data or values determined by the Department.

For purposes of calculating effluent limitations based on this value the accepted design stream flow shall be the actual or estimated lowest 30 consecutive day average flow that occurs once in 10 years.

Nitrite plus Nitrate - not to exceed 10 mg/L as nitrogen.

Rhode Island³⁹

Not specified

Fresh Water
All

Chemical constituents narrative - Waters shall be free from chemical constituents in concentrations or combinations which could be harmful to human, animal, or aquatic life for the appropriate most sensitive and governing water class use or unfavorably alter the biota.

If an aquatic toxicity value has not been established in the R.I. DEM Ambient Water Quality Guidelines (see Appendix B), then the level of any "priority pollutant" (see Appendix B) shall not exceed the "detection limits" in the ambient water unless the discharger demonstrates to the satisfaction of the Director that a higher concentration will not adversely effect the most sensitive use of the water body.

Class A

Chemical constituents - The limits prescribed by the United States Environmental Protection Agency will be used where not superseded by more stringent State requirements.

Class B and C

Chemical constituents - The ambient concentration of a pollutant in a water body designated as suitable for fish and/or wildlife habitat shall not exceed the Ambient Water Quality Guidelines, (see Appendix B) for the protection of aquatic organisms from chronic effects, unless the chronic guideline is modified by the Director based on results of bioassay tests conducted in accordance with the terms and conditions provided in Appendix C.

Class D

Chemical constituents - The ambient concentration of a pollutant in a water body designated as suitable for fish migration shall not exceed the R.I. DEM Ambient Water Quality Guidelines (see Appendix B) for the protection of aquatic organisms from acute effects, unless the acute guideline is modified by the Director

State and Water Use

Criteria Values

based on results of bioassay tests conducted in accordance with the terms and conditions provided in Appendix C.

Sea Water

If an aquatic toxicity value has not been established in the R.I. DEM Ambient Water Quality Guidelines (see Appendix B), then the level of any "priority pollutant" (see Appendix B) shall not exceed the "detection limits" in the ambient water unless the discharger demonstrates to the satisfaction of the Director that a higher concentration will not adversely effect the most sensitive use of the water body.

Class SA

Chemical constituents - None in concentrations or combinations which would be harmful to human, animal or aquatic life or which would make the waters unsafe or unsuitable for fish or shellfish or their propagation, impair the palatability of same, or impair the waters for any other uses.

Class SB

Chemical constituents - None in concentrations or combinations which would be harmful to human, animal or aquatic life or which would make the waters unsafe or unsuitable for fish and shellfish or their propagation, or impair the water for any other usage assigned to this Class.

Class SC

Chemical constituents - None in concentrations or combinations which would be harmful to human, animal or aquatic life or which would make the waters unsafe or unsuitable for fish or shellfish or their propagation, or impair the water for any other usage assigned to this Class. The ambient concentration of a pollutant in a water body designated as suitable for fish and/or wildlife habitat shall not exceed the R.I. DEM Ambient Water Quality Guidelines (see Appendix B) for the protection of aquatic organisms from chronic effects, unless the chronic guideline is modified by the Director based on results of bioassay tests conducted in accordance with the terms and conditions provided in Appendix C.

South Carolina⁴⁰

Class AA and SAA

Standards narrative - Natural conditions will be maintained and protected as feasible, within the Departments statutory authority.

State and Water UseCriteria Values**South Dakota**⁴¹

Domestic Water Supply	Nitrates (as N) may not exceed 10 mg/L with a variation allowed under subdivision 74:03:02:32(1).
Coldwater Permanent and Marginal Fish Life Propagation	Un-ionized ammonia nitrogen may not exceed 0.02 mg/L (as N) with a variation allowed under subdivision 74:03:02:32(2).
Warmwater Permanent and Semipermanent Fish Life Propagation	Un-ionized ammonia nitrogen may not exceed 0.04 mg/L (as N) with a variation allowed under subdivision 74:03:02:32(2).
Warmwater Marginal Fish Life Propagation	Un-ionized ammonia nitrogen may not exceed 0.04 mg/L (as N) with a variation allowed under subdivision 74:03:02:32(2).
Wildlife Propagation and Stock Watering	Nitrates may not exceed 50 mg/L (as N) with a variation allowed under subdivision 74:03:02:32(2).

Tennessee⁴²

Not specified

Texas⁴³

Nutrient Parameters. Generally applicable criteria for nitrogen, phosphorus, carbon, and trace elements cannot be established because sufficient information on nutrient cycling in Texas waters and cause-effect relationships between nutrient concentrations and water quality is not presently available. Site-specific nutrient criteria and/or permit limitation, where appropriate, will be established as information becomes available and after public participation and proper hearing. Nutrients from permitted discharges or other controllable sources shall not cause excessive growth of aquatic vegetation which impairs an existing or designated use.

Utah⁴⁴

Domestic Water Class 1C	NO ₃ as N - 10 mg/L
Aquatic Wildlife Class 3A and 3B	NH ₃ as N (un-ionized) - 4 day average and 1 hour average as national criteria.
Class 3C and 3D	1 hour average as warm water national criterion.

State and Water UseCriteria Values**Vermont**⁴⁵

Not specified

All

Nutrients - No increase which would accelerate eutrophication or result in concentrations that may stimulate the growth of aquatic plants, fungi or bacteria, in a manner which has an undue adverse effect on any beneficial values or uses.

Virginia⁴⁶

Public Water Supply

Nitrate as N - 10.0 mg/L

Washington⁴⁷

Not specified

West Virginia⁴⁸

A, B1, & B3

The concentration of un-ionized ammonia (NH₃) shall not exceed 0.05 mg/L. Un-ionized ammonia shall be determined from values of total ammonia-N, pH and temperature according to the following equation:

$$\text{NH}_3 = 1.2 (\text{total ammonia-N} / [1 + 10^{(\text{pK}_a - \text{pH})}])$$

where:

$$\text{pK}_a = 0.0902 + 2730 / (273.2 + T)$$

T = temperature in °C

Category A

Nitrate (as N) - 10 mg/L

B1 & B3

Nitrite (as N) - 1.0 mg/L

Trout Waters (B2)

Un-ionized Ammonia - 0.02 mg/L

Nitrite (as N) - 0.06 mg/L

Wisconsin⁴⁹

Intermediate Aquatic Life

NH₃-N - not to exceed weekly average of 3 mg/L from May through October and 6 mg/L from November through April.

Wyoming⁵⁰

Class I, II and III

In all Class I, II and III waters which are designated as cold water fisheries, the concentration of un-ionized ammonia (as N) shall not exceed 0.02 mg/L.

State and Water UseCriteria Values**American Samoa⁵¹**

All

Total Nitrogen

Median not to exceed 0.30 mg/L

Not to exceed 0.65 mg/L 10% of the time

Not to exceed 1.0 mg/L 2% of the time

Criteria values for specific water bodies can be found
in Water Quality Standards for American Samoa.

District of Columbia⁵² Not specified**Guam⁵³**

M-1

Nitrate-nitrogen (NO₃-N) shall not exceed:
0.10 mg/L

M-2, S-1

0.20 mg/L

M-3, S-2, S-3

0.50 mg/L

N. Mariana Islands⁵⁴

AA

Total nitrogen shall not exceed:
0.4 mg/L

A, 1

0.75 mg/L

2

1.50 mg/L

AA, A, 1, 2

Ammonia (un-ionized) shall not exceed 0.02 mg/L

Puerto Rico⁵⁵

SD (Surface Waters)

Nitrate as N - 10 mg/L

SB, SC (Coastal Waters) Nitrogen (NO₃, NO₂, NH₃) - 5 mg/L**Trust Territory⁵⁶**

AA, A

Total Nitrogen as N shall not exceed:
0.400 mg/L

B

0.800 mg/L

1

0.750 mg/L

2

1.500 mg/L

Virgin Islands⁵⁷

Not specified