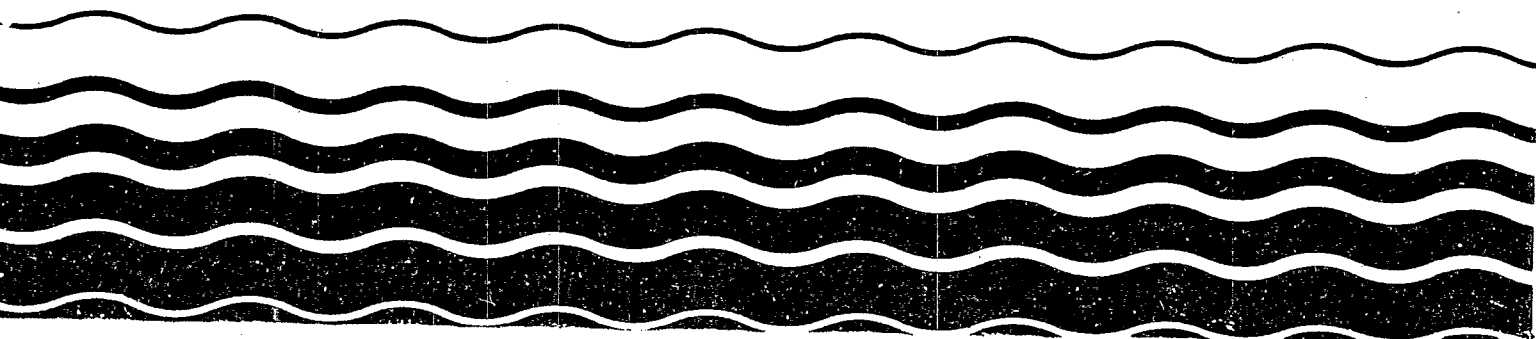




Water

# Acidity-Alkalinity (pH)

Water Quality Standards  
Criteria Summaries:  
A Compilation  
of State/Federal Criteria



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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

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## 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).

This digest deals with pH and its use in State water quality criteria. The pH is an indication of the degree of hydrogen ion concentration and hydrogen ion activity. In natural conditions, pH is determined by weak and strong acids and bases, and their salts. Toxicologically, pH can have certain adverse effects on the physiology and development of many aquatic life forms. It can also effect the degree of toxicity of many chemicals by altering their solubility and association with the hydrogen ions or other elements in water. The 1986 Quality Criteria for Water recommends a criteria range of pH which will provide protection from adverse effects for specific water uses.

### Range

5 - 9	Domestic water supplies (welfare)
6.5-9.0	Freshwater aquatic life
6.5-8.5	Marine aquatic life (but not more than 0.2 units outside of normally occurring range)

Since water quality standards are revised from time to time, following procedures set forth in the Clean Water Act, individual entries in this digest may be superseded. This digest will be updated periodically. Because this publication is intended for use only as a general information reference, the reader needs to refer to the current approved water quality standards to obtain the latest information for special purposes and applications. These can be obtained from the State water pollution control agencies or the EPA Regional Offices.

## REFERENCES

- 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.
- 31 Water Quality Standards for Interstate and Intrastate Streams in New Mexico, State of New Mexico Water Quality Control Commission, 1988.
- 35 Ohio Water Quality Standards, Chapter 3745-1 of the Administrative Code, Ohio Environmental Protection Agency, 1985.
- 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.
- 45 Vermont Water Quality Standards, State of Vermont Water Resource Board, 1987.
- 51 Water Quality Standards for American Samoa, 1984, pp. 20-25.
- 53 Revised Guam Water Quality Standards, Guam Environmental Protection Agency, 1984, pp. 8 + 23.
- 54 Commonwealth of Northern Mariana Islands Marine and Fresh Water Quality Standards, Commonwealth Register, Vol. 8 No. 5, 1986, p. 4464.
- 56 Marine and Fresh Water Quality Standard Regulations, Trust Territory, 1986, p. 6.
- 57 Environmental Laws and Regulations of the Virgin Islands, 1985.

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- 1 Pages 701:1003, June 26, 1981, 701:1004-1010, September 5, 1980
- 2 Pages 706:1003, 1007, November 7, 1986
- 3 Page 711:1017, February 7, 1986
- 4 Page 716:1004, August 30, 1985
- 7 Pages 731:1004-1008, May 14, 1982
- 8 Pages 736:1007-1010, March 28, 1986

- 9 Pages 746:1010.2-1010.3, September 5, 1986, 746:1011-1014. January 21, 1983
- 10 Pages 751:0504-0505, December 27, 1985
- 11 Pages 756:1003-1008, September 20, 1985
- 12 Page 761:1027, January 23, 1987
- 13 Pages 766:0505-0506, 0514, March 28, 1986, 766:0507-0508, May 25, 1984
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- 17 Pages 786:1008-1009, November 29, 1985
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- 19 Pages 796:0104-0108, April 18, 1986
- 20 Pages 801:1001-1003, April 19, 1985
- 21 Pages 806:1002-1003, June 21, 1985
- 22 Page 811:1003, February 13, 1987
- 23 Pages 816:1006-1009, June 25, 1982
- 24 Page 821:1002, October 25, 1985
- 25 Pages 826:1001-1004, May 9, 1986, 826:1004.1, February 7, 1986, 826:1005, 1008, June 21, 1985
- 26 Pages 831:1004-1009, April 19, 1985
- 27 Page 836:1003, March 27, 1987
- 28 Pages 841:1001-1002, 1011, February 22, 1985, 841:1003-1010, June 29, 1984
- 29 Page 846:1004, October 5, 1984
- 30 Pages 851:1009-1024, April 11, 1986
- 32 Pages 861:1007-1012, November 29, 1985
- 33 Pages 866:1009, 1012, August 29, 1986
- 34 Pages 871:1002-1004, June 7, 1985
- 36 Page 881:1005, September 26, 1986

- 37 Pages 886:1005-1047, May 9, 1986
- 38 Pages 891:1004-1006, August 9, 1985
- 39 Pages 901:1001-1005, August 9, 1985
- 40 Pages 906:1006-1009, November 29, 1985
- 41 Pages 911:1005-1007, March 22, 1985
- 42 Pages 916:0541-0544, September 7, 1984, 916:1002, April 28, 1978
- 46 Page 936:1002, February 28, 1986
- 47 Pages 941:1003-1005, October 21, 1983
- 48 Pages 946:1003-1009, August 10, 1984
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- 50 Page 956:1006, July, 5, 1985
- 52 Pages 741:1001, 1003, March 28, 1986
- 55 Pages 896:1003-1004, December 23, 1983

KEY

PWS Public Water Supply  
F&WL Fish and Wildlife  
Agr. Agricultural  
Ind. Industrial  
Rec. Recreation  
Nav. Navigation  
mg/l Milligrams per Liter  
SAR Sodium Absorption Ratio

(For explanation of use classifications, see EPA publication, General Stream Use Designations.)



State and Water Use

Acidity-Alkalinity (pH) Criteria

Alabama<sup>1</sup>

PWS, Swimming, F&WL,  
\*A&I, \*IO, and Nav.

Sewage, industrial wastes or other wastes shall not cause the pH to deviate more than one unit from the normal or natural pH nor be less than 6.0 nor greater than 8.5.

Swimming, F&WL, \*A&I,  
\*IO, and Nav.

For estuarine and salt waters to which this classification is assigned, wastes as described herein shall not cause the pH to deviate more than one unit from the normal or natural pH nor be less than 6.5 or greater than 8.5.

Shellfish

Sewage, industrial wastes or other wastes shall not cause the pH to deviate more than one unit from normal or natural pH nor be less than 6.5 nor greater than 8.5.

\*In the State of Alabama, there are two separate classifications:

1. Agricultural & Industrial Water Supply (A&I)
2. Industrial Operations (IO)

Alaska<sup>2</sup>

Fresh Waters

PWS

6.0 - 8.5 not vary more than 0.5 pH unit from natural condition

Agr.

5.0 - 9.0

6.8 - 8.5 for dairy sanitation

Aquaculture

6.5 - 8.5 not vary more than 0.5 pH unit from natural condition

Ind.

5.0 - 9.0

Rec. (Contact)

6.5 - 8.5 not vary more than 0.5 pH unit from natural condition;

If the natural condition pH is outside this range substances shall not be added that cause an increase in buffering capacity of the water.

Rec. (Secondary)

5.0 - 9.0

F&WL, Shellfish

6.5 - 9.0 not vary more than 0.5 pH unit from natural condition

Marine Waters

Aquaculture

6.5 - 8.5 not vary more than 0.1 pH unit from natural condition

State and Water UseAcidity-Alkalinity (pH) Criteria

Seafood Processing	6.0 - 8.5 not vary more than 0.5 pH unit from natural condition
Ind.	5.0 - 9.0
Rec. (Contact)	6.5 - 8.5 If the natural condition pH is outside this range substances shall not be added that cause an increase in buffering capacity of the water.
Rec. (Secondary)	5.0 - 9.0
F&WL, Shellfish	6.5 - 8.5 not vary more than 0.1 pH unit from natural condition
Harvesting for Consumption of Raw Mollusks or Other Raw Aquatic Life	6.0 - 8.5 not vary more than 0.5 pH unit from natural condition

Arizona<sup>3</sup>

DWS	no standard	NS	
FBC	6.5 - 9.0	0.5	maximum change
IHC	6.5 - 9.0	0.5	due to the
A&W	6.5 - 9.0	0.5	activities of
AgI	4.5 - 9.0	NS	man
AgL	6.4 - 9.0	NS	

DWS = Domestic Water Source

FBC = Full Body Contact

IHC = Incidental Human Contact

A&W = Aquatic & Wildlife

AgI = Agricultural Irrigation

AgL = Agricultural Livestock Watering

NS = No Standard

Arkansas<sup>4</sup>

All 6.0 - 9.0 Fluctuation not more than 1.0 pH unit over a period of 24 hours.

The pH shall not go out of the range due to wastes discharged to the receiving waters.

State and Water Use

Acidity-Alkalinity (pH) Criteria

California<sup>5</sup>

(1A) Klamath River Basin

The pH shall not be depressed below 6.5 nor raised above 8.5.

Changes in normal ambient pH levels shall not exceed 0.2 units in waters with designated marine (MAR) or saline (SAL) beneficial uses nor 0.5 units within the range specified above in fresh waters with designated COLD or WARM beneficial uses.

(1B) North Coastal Basin

(Same as 1A)

(2) San Francisco Bay Basin

(Same as 1A)

(3) Central Coastal Basin

Objectives for Inland Surface Waters, Enclosed Bays and Estuaries

The pH shall neither be depressed below 6.5 nor raised above 8.3 in waters with designated REC-1, REC-2, AGR, or MUN beneficial uses. For waters with designated aquatic habitat protection, including WARM, COLD, MAR, and BIOL, and for waters not otherwise mentioned, the pH shall not be depressed below 7.0 or raised above 8.5.

Changes in normal ambient pH levels shall not exceed 0.2 in waters with designated MAR beneficial uses, nor 0.5 in fresh waters with designated COLD or WARM beneficial uses.

(4A) Santa Clara River Basin

(Same as 1A)

(4B) Los Angeles River Basin

Objectives for Inland Surface Waters, Enclosed Bays and Estuaries

(Same as 1A)

(5A,B,C) Sacramento-San Joaquin Delta

The following water quality objectives apply to all inland surface waters (excluding the Delta) of the basins, and objectives that apply only to specific surface water bodies.

The pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses.

The following water quality objectives apply to Goose Lake: pH shall be less than 9.5 and greater than 7.5 at all times.

State and Water Use

Acidity-Alkalinity (pH) Criteria

The following specific numeric objectives apply to the waters of the Sacramento-San Joaquin Delta. All waters lying within the legal boundaries of the Delta are covered by these objectives unless otherwise specified.

The pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses.

(5D) Tulare Lake Basin The pH shall not be depressed below 6.5 nor raised above 8.3 nor changed at any time more than 0.3 from normal ambient pH levels.

(6A) North Lahontan Basin The pH shall not be depressed below 6.5 nor raised above 8.5, except in Eagle Lake where the pH shall not be depressed below 8.0 nor raised above 9.5 and in Lake Tahoe where the pH shall not be depressed below 7.0 nor raised above 8.4.

Changes in normal ambient pH levels shall not exceed 0.5 units in fresh waters with designated COLD or WARM beneficial uses.

(6B) South Lahontan Basin The pH shall not be depressed below 6.5 nor raised above 8.5.

Changes in normal ambient pH levels shall not exceed 0.5 units in fresh waters with designated COLD or WARM beneficial uses.

(7A) West Colorado River Basin Changes in normal ambient pH levels attributable to controllable water quality factors shall not exceed 0.5 units; and shall not depress the receiving water pH below 6.5 units nor raise it above 8.5 units.

(7B) East Colorado River Basin Changes in normal ambient pH levels attributable to controllable water quality factors shall not exceed 0.5 units; and shall not depress the receiving water pH below 6.5 units nor raise it above 8.5 units.

(8) Santa Ana River Basin (1) All bay and estuary waters:

As a result of controllable water quality factors, the pH shall not be depressed below 7.0 units nor raised above 8.6 units.

Changes in normal ambient pH levels shall not exceed 0.2 units.

State and Water Use

Acidity-Alkalinity (pH) Criteria

(2) All inland surface waters:

(a) The pH of all water except Baldwin Lake shall not be depressed below 6.5 units nor raised above 8.5 units as a result of controllable water quality factors.

(b) The pH of Baldwin Lake shall not be depressed below 6.5 units nor raised above 8.9 units as a result of controllable water quality factors.

(c) Changes in normal ambient pH levels shall not exceed 0.5 units in any inland surface water.

(9) San Diego Basin

Changes in normal ambient pH levels shall not exceed 0.2 units in waters with designated marine (MAR) or saline (SAL) beneficial uses nor 0.5 units in fresh waters with designated COLD or WARM beneficial uses.

In bays and estuaries the pH shall not be depressed below 7.0 nor raised above 8.5.

In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.

Ocean Plan

The pH shall not be changed at any time more than 0.2 units from that which occurs naturally.

Colorado<sup>6</sup>

Recreational:

Class 1; Primary Contact 6.5-9.0 units

Class 2; Secondary Contact 6.5-9.0 units

Aquatic Life:

Class 1; Cold Water Biota 6.5-9.0 units

Class 1; Warm Water Biota 6.5-9.0 units

Domestic Water Supply: 5.0-9.0 units

State and Water Use

Acidity-Alkalinity (pH) Criteria

Connecticut<sup>7</sup>

Inland Water

Class AA PWS

as naturally occurs

Class A PWS/Swim

as naturally occurs

Class B Swim/Rec./Agr./Ind./F&WL

6.5 - 8.0

Class C F&WL/Ind./Nav.

6.0 - 8.5

Class D

Not specified

Coastal and Marine Water

Class SA Shellfish/Swim

6.8 - 8.5

Class SB Swim/Rec./Ind./F&WL

6.8 - 8.5

Class SC F&WL/Shellfish/Nav./Ind.

6.5 - 8.5

Class SD

Not specified

Groundwaters

Class GA PWS

Class GAA PWS

As naturally occurs or as may result from normal agricultural, horticultural silviculture, lawn maintenance or construction activity provided all reasonable controls are used.

Delaware<sup>8</sup>

All

pH shall be between 6.5 - 8.5 unless due to natural conditions. Where outside the stipulated range due to natural conditions, shall not vary more than 5% due to human-induced changes.

ERES Waters: Where pH falls outside the range from 6.5 to 8.5 due to natural conditions, no human-induced change shall be allowed.

Alkalinity - Shall not vary from natural conditions:  
(a) by more than 25% where >20 mg/l as CaCO<sub>3</sub>; or  
(b) where less than or equal to 20 mg/l.

Florida<sup>9</sup>

All

6.0 - 8.5 pH - shall not vary more than one unit above or below natural background provided that the pH is not lowered to less than 6 units or raised above 8.5 units. If natural background is less than 6 units, the pH shall not vary below natural background or vary more than one unit above natural background. If natural background is higher than 8.5 units, the pH

State and Water UseAcidity-Alkalinity (pH) Criteria

shall not vary above natural background or vary more than one unit below natural background.

Class I PWS

Alkalinity

no less than 20 mg/l as CaCO<sub>3</sub>

Class II Shellfish

Not specified

Class III Rec.

no less than 20 mg/l as CaCO<sub>3</sub>

Class IV Agr.

not more than 600 milligrams (mg)/l as CaCO<sub>3</sub>

Class V Nav.&Ind.

Not specified

Class I PWS

pH

Not specified

Class II Shellfish

pH - shall not vary more than one unit above or below natural background of coastal waters as defined in 17-3.05(1)(c), F.A.C., or more than two-tenths unit above or below natural background of open waters as defined in 17-3.05(1)(c), F.A.C., provided that the pH is not lowered to less than 6.5 units or raised above 8.5 units. If natural background is less than 6.5 units the pH shall not vary below natural background or vary more than one unit above natural background for coastal waters or more than two-tenths unit above natural background for open waters. If natural background is higher than 8.5 units, the pH shall not vary above natural background or vary more than one unit below natural background of coastal waters, or more than two-tenths unit below natural background of open waters.

Class III Rec.

pH - shall not vary more than one unit above or below natural background of predominantly fresh waters and coastal waters as defined in 17-3.05(1)(c), F.A.C., or more than two-tenths unit above or below natural background of open waters as defined in 17-3.05(1)(c), F.A.C., provided that the pH is not lowered to less than 6 units in predominantly fresh waters, or less than 6.5 units in predominantly marine waters, or raised above 8.5 units. If natural background is less than 6 units, in predominantly fresh waters or 6.5 units in predominantly marine waters, the pH shall not vary below natural background or vary more than one unit above natural background of predominantly fresh waters and coastal waters, or more than two-tenths unit above natural background of open waters. If natural background is higher than 8.5 units, the pH shall not vary above natural background or vary more than one unit below natural background of predominantly fresh waters and coastal waters, or more than two-tenths unit below natural background of open

State and Water UseAcidity-Alkalinity (pH) Criteria

waters.

Class IV Agr.

Not specified

Class V Nav.&amp;Ind.

pH 5.0 - 9.5 except certain swamp waters which may be as low as 4.5

Georgia<sup>10</sup>

PWS

6.0 - 8.5

Rec.

6.0 - 8.5

F&amp;WL, Shellfish

6.0 - 8.5

Agr.

6.0 - 8.5

Ind.

6.0 - 8.5

Nav.

6.0 - 8.5

Hawaii<sup>11</sup>

Streams

5.5 - 8.0 pH Units shall not deviate more than 0.5 units from ambient conditions for all seven classes.

Elevated Wetlands

4.5 - 7.0

Estuaries (except Pearl Harbor)

7.0 - 8.6

Pearl Harbor

6.8 - 8.8

Embayments

8.1

Open Coastal Waters

8.1

Oceanic Waters

8.1

Idaho<sup>12</sup>

All

Values for all waters are to be within the range of 6.5 - 9.0

Illinois<sup>13</sup>

General Standards

pH shall be within the range of 6.5 to 9.0 except for natural causes.

Secondary Contact &amp;

pH shall be within the range of 6.0 to 9.0 except for



State and Water Use

Acidity-Alkalinity (pH) Criteria

Indigenous Aquatic Life

natural causes.

Lake Michigan

pH shall be within the range of 7.0 to 9.0 except for natural causes.

Effluent Standards

(a) Except as provided below no person shall cause or allow the pH in any effluent to be outside the range of 6.0 - 9.0.

(b) The pH limitation is not subject to the averaging rule contained in Section 304.104 (a).

(c) Effluents which are monitored so as to provide a permanent, continuous pH record may be outside of the listed range for a total of not more than fifteen minutes in any day provided the excursion is accidental and less than one pH unit above or below the listed range.

(d) The pH 9 maximum limitation may be exceeded if the elevated pH level:

1) is caused entirely by algae in treatment lagoons, in which case there is no upper pH limit; or

2) is caused by the addition of alkali in the waste water treatment process to cause precipitation of barium, cadmium, chromium, copper, lead, manganese, zinc, or other materials requiring such elevated pH for treatment, in which case the upper limit shall be pH 10 and subsection (c) shall not apply to the upper limit.

(e) The burden of proving that paragraph (c) or (d) applies is upon the discharger.

Indiana<sup>14</sup>

Aquatic Life

No pH values below 6.0 nor above 9.0, except daily fluctuations which exceed pH 9.0 and are correlated with photosynthetic activity, shall be permitted.

Lake Michigan: Open Water and Contiguous Harbor Areas

No pH values below 7.5 nor above 8.5, except daily fluctuations which exceed pH 8.5 and are correlated with photosynthetic activity, may be tolerated.

Grand Calumet River; Indiana Harbor

No pH values below 6.0 nor above 9.0, except daily fluctuations which exceed pH 9.0 and are correlated with photosynthetic activity, shall be permitted.

State and Water Use

Acidity-Alkalinity (pH) Criteria

Natural Spawning,  
Rearing or Imprinting  
Areas for Salmonid  
Fishes

1. Trail Creek and tributaries upstream of U.S. Highway 35.
2. Little Calumet River and tributaries upstream (easterly) of the Wagner Road Bridge. The Wagner Road Bridge is located downstream of Chesterton at the southeast corner of the southwest quarter, Section 26, T37N, R6W, Porter County, Indiana.
3. Kintzele Ditch (Black Ditch) from Beverly Drive downstream to Lake Michigan.
4. Salt Creek above its confluence with the Little Calumet River.
5. Galena River and its tributaries LaPorte County

pH: No values below 6.0 or above 9.0, except daily fluctuations which exceed pH 9.0 and are correlated with photosynthetic activity, may be tolerated.

Migration Routes  
for Salmonid Fishes

1. Trail Creek from Highway 35 downstream to Lake Michigan.
2. Little Calumet River from Wagner Road Bridge downstream to Lake Michigan via Burns Ditch.
3. The St. Joseph River and its tributaries in St. Joseph County from the Twin Branch Dam in Mishawaka downstream to the Indiana-Michigan State Line.

pH: No values below 6.0 or above 9.0, except daily fluctuations which exceed pH 9.0 and are correlated with photosynthetic activity, may be tolerated.

Iowa<sup>15</sup>

All

6.5 - 9.0 with a maximum change of 0.5 units as a result of a waste discharge

Kansas<sup>16</sup>

All

Artificial sources shall not cause the pH of surface waters to be below 6.5 nor above 8.5.

State and Water Use

Acidity-Alkalinity (pH) Criteria

Kentucky<sup>17</sup>

Aquatic Life and Recreation

6.0 - 9.0 and shall not fluctuate more than one (1) pH unit over a period of 24 hours

Louisiana<sup>18</sup>

All

6.0 - 9.0 unless natural conditions exceed this range or where otherwise specified. No discharge of wastes shall cause the pH of the waterbody to vary by more than one pH unit within the specified pH range for that segment where the discharge occurs.

For criteria specific segments, see BNA Environment Reporter pages 791:1021 - 1056.

Maine<sup>19</sup>

Class A

None which would be in a range that would be harmful to humans or aquatic life

Class B-1

6.0 - 8.5

Class B-2

6.0 - 8.5

Class C

6.0 - 8.5

Class D

No range that would impair uses

Class SA

6.7 - 8.5

Class SB1

6.7 - 8.5

Class SB2

6.7 - 8.5

Class SC

6.7 - 8.5

Class SD

No range that would impair uses

Maryland<sup>20</sup>

All Classes

6.5 - 8.5

Massachusetts<sup>21</sup>

Inland Waters  
Class A PWS

as naturally occurs

Class B Swim, F&WL

6.5 - 8.0; not more than 0.2 units outside naturally

State and Water Use      Acidity-Alkalinity (pH) Criteria

occurring range

Class C F&WL, Rec.      6.5 - 9.0; not more than 0.2 units outside naturally occurring range

Ind.      6.0 - 9.0

Coastal and Marine Waters

Class SA      6.5 - 8.5; not more than 0.2 units outside naturally occurring range

Class SB      Same as SA

Class SC      Same as SA

Michigan<sup>22</sup>

All      R 323.1053. Hydrogen ion concentration.  
Rule 53. The hydrogen ion concentration expressed as pH shall be maintained within the range of 6.5 to 9.0 in all waters of the state. Any artificially induced variation in the natural pH shall remain within this range and shall not exceed 0.5 units of pH.

Minnesota<sup>23</sup>

Fisheries and Recreation

Class A      pH 6.5 - 8.5

Class B      pH 6.5 - 9.0

Class C      pH 6.5 - 9.0

Industrial Consumption

Class A      pH 6.5 - 8.5

Class B      pH 6.0 - 9.0

Class C      pH 6.0 - 9.0

Agriculture and Wildlife

Class A      pH 6.0 - 8.5

Class B      pH 6.0 - 9.0

Navigation and Waste Disposal

pH 6.0 - 9.0

Limited Resource Value Waters

pH 6.0 - 9.0

State and Water UseAcidity-Alkalinity (pH) CriteriaMississippi<sup>24</sup>PWS, Shellfish, Rec.,  
F&WL

The normal pH of the waters shall be 6.0 - 8.5 and shall not be caused to vary more than 1.0 unit; however, should the background pH be outside the limits, it shall not be changed more than 1.0 unit unless after the change the pH will fall within the limits, and the Commission determines that there will be no detrimental effect on stream usage as a result of the greater pH change.

Missouri<sup>25</sup>Effluent Limitations for:Missouri and  
Mississippi Rivers 6.0 - 9.0

Lakes and Reservoirs 6.0 - 9.0

Losing Stream 6.0 - 9.0

Wild and Scenic  
Rivers and Ozark 6.0 - 9.0National Scenic  
Riverways and Drainage 6.0 - 9.0

All other waters pH: Effluents shall not cause pH to be outside the range of 6.5 - 9.0 in waters of the state.

Montana<sup>26</sup>Class

A-closed - PWS no change from natural pH

A-1 - PWS 6.5 - 8.5

B-1 - PWS, Rec., F&WL,  
Agr., Ind. 6.5 - 8.5B-2 - PWS, Rec., F&WL,  
Agr., Ind. 6.1 - 9.0B-3 - PWS, Rec., F&WL,  
Agr., Ind. 6.5 - 9.0C-1 - Rec., F&WL, Agr.,  
Ind. 6.5 - 8.5C-2 - Rec., F&WL, Agr.,  
Ind. 6.5 - 9.0

State and Water Use      Acidity-Alkalinity (pH) Criteria

C-3 - Rec., F&WL, Agr., 6.5 - 9.0  
Ind.

E - Agr., Ind. (non-  
Food)      6.5 - 9.5

In all cases except  
Class E

Induced variation must be < 0.5 pH unit. Natural pH  
outside the range must be maintained without change.  
Natural pH above 7.0 shall be maintained above 7.0.

Nebraska<sup>27</sup>

All

6.5 - 9.0 unless pH values outside this range are due  
to natural conditions.

Nevada<sup>28</sup>

Classes A, B, & C  
PWS, Agr., F&WL, Rec.,  
Nav., Ind.

6.5 - 8.5 as a single value. Annual median range  
differs for each basin.

Class D Nav., F&WL,  
Agr., Ind. (non-food)

6.0 - 9.0

New Hampshire<sup>29</sup>

Class A

as naturally occurs

Class B

6.5 - 8.0 or as naturally occurs

Class C

6.0 - 8.5 or as naturally occurs

New Jersey<sup>30</sup>

FW1

as naturally occurs

FW2

6.5 - 8.5

PL

3.5 - 5.5 unless it is demonstrated that a pH level  
outside this range is necessary to protect the  
existing/designated uses.

SE

6.5 - 8.5

SC

Natural pH conditions shall prevail.

State and Water Use      Acidity-Alkalinity (pH) Criteria

Mainstem Delaware River and Delaware Bay  
 Zones 1C, 1D, 1E      6.0 - 8.5

Zones 2, 3, 4, 5, 6      6.5 - 8.5

Zone 1E      Alkalinity  
 not < 20 mg/l

Zone 2      20 - 100 mg/l

Zones 3, 4, 5, 6      20 - 120 mg/l

FW1 = Rec., F&WL

FW2 = F&WL, Rec., Agr., Ind., PWS

PL = (Pineland Waters) Cranberry bog water supply,  
 PWS, Rec., indigenous F&WL

SE = (Saline Waters and Estuaries) F&WL, Shellfish,  
 Rec.

SC = (Coastal Saline Waters) Shellfish, Rec., F&WL

Zones 1C, 1D, 1E = Agr., Ind., PWS, F&WL, Rec.

Zones 2, 3 = Same as Zone 1 plus Nav.

Zones 4, 5, 6 = Ind., F&WL, Rec., Nav.

New Mexico<sup>31</sup>

Coldwater Fishery      6.6 - 8.8

High Quality Coldwater  
 Fishery      6.6 - 8.8

Marginal Coldwater  
 Fishery      6.6 - 9.0

Primary Contact  
 Recreation      6.6 - 8.8

Warmwater Fishery      6.0 - 9.0

New York<sup>32</sup>

Class N      Natural conditions

AA, A, B, C      6.5 - 8.5

D      6.0 - 9.5

State and Water Use

Acidity-Alkalinity (pH) Criteria

SA, SB, SC, SD, I

Normal range shall not be extended by more than one-tenth (0.1) pH unit

A - Special (Inter-national Boundary waters)

6.7 - 8.5

Fresh Waters

Class AA = PWS and any other usages

Class A = PWS and any other usages

Class B = Rec. and any other usages except PWS

Class C = Fishing and any other uses except PWS and Primary Contact Rec.

Class D = Secondary Contact Rec. but not Fish

Saline Waters

Class SA = Shellfish and Rec.

Class SB = Rec. and any other use except Shellfish

Class SC = Fishing and other uses except Shellfish and Primary Contact Rec.

Class SD = All waters not primarily for Rec., Shellfish, or Fish

Special Waters

Class A-Special = PWS, Rec., and other usages

Class I = Secondary Contact Rec. and any other usage except Primary Contact Rec. and Shellfish

North Carolina<sup>33</sup>

Fresh Waters

pH shall be normal for waters in the area, which generally shall range between 6.0 - 9.0 except that swamp waters may have a low of 4.3.

Tidal Salt Waters

pH shall be normal for the waters in the area, which generally range between 6.8 - 8.5 except that swamp waters may have a low of 4.3.

North Dakota<sup>34</sup>

General Requirements

6.0 - 9.0

Class I Streams

7.0 - 8.5



State and Water Use

Acidity-Alkalinity (pH) Criteria

Class IA Streams

Same as above

Class II Streams

6.0 - 9.0

Class III Streams

Same as Class II

Class I = F&WL, Rec., Nav., PWS, Agr.

Class IA = Same as above

Class II = Same as above except PWS, Agr.

Class III = Ind., Agr.

Ohio<sup>35</sup>

Aquatic Life Habit.

6.5 - 9.0

Lake Erie Outside  
Excepted Areas

pH 6.5 to 9.0 with no change within that range  
attributable to man-induced conditions.

Ohio River

No pH value below 6.0 nor above 9.0.

Nuisance Prevention

6.5 - 9.0, acid mine drainage streams over sandstone  
geotype are exempt from the pH criterion.

Oklahoma<sup>36</sup>

F&WL

6.5 - 9.0 unless pH values outside this range are due  
to natural conditions (no criteria given for other  
water uses)

Oregon<sup>37</sup>

North Coast-Lower Columbia Basin

Mid Coast Basin

pH values shall not fall outside the following ranges:

Umpqua Basin

Marine waters: 7.0 - 8.5

South Coast Basin

Estuarine and fresh waters: 6.5 - 8.5

Rogue Basin

Willamette Basin

Sandy Basin

Hood Basin

Deschutes Basin

John Day Basin

Umatilla Basin

Main Stem of Columbia River: 7.0 - 8.5

All other Basin streams + waters: 6.5 - 8.5

Walla Walla Basin

6.5 - 8.5

State and Water Use      Acidity-Alkalinity (pH) Criteria

Grande Ronde Basin	
Main Stem Snake River:	7.0 - 9.0
All other Basin streams:	6.5 - 8.5
Powder Basin	
All Basin Streams:	6.5 - 9.5
Malheur River Basin	7.0 - 9.0
Owyhee Basin	7.0 - 9.0
Malheur Lake Basin	7.0 - 9.0
Goose and Summer Lakes Basin	
Goose Lake:	7.5 - 9.5
All other Basin waters:	7.0 - 9.0
Klamath Basin	7.0 - 9.0

Pennsylvania<sup>38</sup>

Depending on Stream and Water Use

Alkalinity  
Alk<sub>1</sub>: Equal to or > 20 mg/l as CaCO<sub>3</sub>, except where natural conditions are less. Where discharges are to waters with 20 mg/l or less alkalinity, the discharge should not further reduce the alkalinity of the receiving waters.

Alk<sub>2</sub>: not < 20 mg/l as CaCO<sub>3</sub>.

Alk<sub>3</sub>: Between 20 and 100 mg/l.

Alk<sub>4</sub>: Between 20 and 120 mg/l.

pH	
pH <sub>1</sub>	6.0 - 9.0
pH <sub>2</sub>	6.5 - 8.5
pH <sub>3</sub>	7.0 - 9.0
pH <sub>4</sub>	6.0 - 8.5

Rhode Island<sup>39</sup>

Fresh Waters  
Class A

as naturally occurs

Class B

6.5 - 8.0 or as naturally occurs

State and Water Use                      Acidity-Alkalinity (pH) Criteria

Class C                                      6.0 - 8.5

Class D                                      6.0 - 9.0

Sea Waters

Class SA                                    6.8 - 8.5

Class SB                                    6.8 - 8.5

Class SC                                    6.5 - 8.5

Class A = PWS

Class B = Agr., Swim, F&WL

Class C = Rec., F&WL, Ind.

Class D = Fish migration

Class SA = Shellfish, Swim, F&WL

Class SB = Same as SA

Class SC = Rec., F&WL, Nav.

South Carolina<sup>40</sup>

Fresh Water

Class AA                                    Natural Conditions

Class A-TROUT                            6.0 - 8.0

Class A (Swimming)                    6.0 - 8.0

Class B-TROUT                            6.0 - 8.5

Class B (PWS, F&WL)                   6.0 - 8.5

Salt Water

Class SAA                                   Natural Conditions

Class SA (Shellfish)                    Shall not vary more than 3/10 of pH unit above or below that of effluent-free waters in the same geographical area having a similar total salinity, alkalinity, and temperature, but not lower than 6.5 or above 8.5.

Class SB (Swimming)                    Same as above except variance limited to 1/2 a pH unit;

Class SC (Fishing)                      Same as above except variance 1 pH unit.

State and Water Use                      Acidity-Alkalinity (pH) Criteria

South Dakota<sup>41</sup>

- 1) Domestic Water Supply                      >6.5 and <9.0 units
- 2) Cold Water Permanent Fish                      >6.6 and <8.6
- 3) Cold Water Marginal Fish                      >6.5 and <8.8
- 4) Warm Water Permanent Fish                      >6.5 and <9.0
- 5) Warm Water Semipermanent Fish                      >6.3 and <9.0
- 6) Warm Water Marginal                      >6.0 and <9.0
- 7) Immersion Recreation                      >6.5 and <8.3
- 8) Limited Contact Rec.                      >6.0 and <9.0
- 9) Wildlife Propagation Stock Watering                      >6.0 and <9.5
- 10) Irrigation Waters                      Not Available
- 11) Commerce & Industry                      >6.0 and <9.5

Tennessee<sup>42</sup>

Fish and Aquatic Life                      6.5 - 8.5 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.

Other Classes (except Navigation)                      6.0 - 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.

Texas<sup>43</sup>

By Segment

Utah<sup>44</sup>

Domestic Source (1C)                      6.5 - 9.0

Recreation & Aesthetics (2A, 2B)                      6.5 - 9.0

State and Water Use

Acidity-Alkalinity (pH) Criteria

Aquatic Wildlife  
(3A, 3B, 3C, 3D)

6.5 - 9.0

Agriculture (4)

6.5 - 9.0

Vermont<sup>45</sup>

Class A Waters

1. pH - No variation from background conditions within the range of 6.5 and 8.0.

Class B Waters

1. pH - Values shall be maintained within the range of 6.5 and 8.0. The change or rate of change in pH either upward or downward resulting from the discharge of wastes shall be controlled so as to prevent any undue adverse effect on aquatic biota, fish or wildlife.

Class C Waters

1. pH - Values shall be maintained within the range of between 6.5 and 8.0. The change or rate of change in pH either upward or downward resulting from the discharge of wastes shall be controlled so as to prevent any undue adverse effect on aquatic biota, fish or wildlife.

Virginia<sup>46</sup>

All

6.0 - 9.0

Washington<sup>47</sup>

Class AA (Extraordinary)

Fresh

6.5 - 8.5 with a man-caused variation

Marine

7.0 - 8.5 within a range of less than 0.2 units

Class A (Excellent) and Class B (Good)

Fresh

6.5 - 8.5 with a man-caused variation

Marine

7.0 - 8.5 within a range of less than 0.5 units

Class C (Fair)

Fresh

6.5 - 9.0 with a man-caused variation

Marine

6.5 - 9.0 within a range of less than 0.5 units

Lake Class

no measurable change from natural conditions

