

AMERICAN SAMOA WATER QUALITY STANDARDS
2013~~8~~ Revision
Administrative Rule No. 001-2013

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§24.0201 Definitions

As used in this chapter and in conformance with the Federal Water Pollution Control Act, as amended:

"acute exposure value" means the threshold value at or below which there should be no unacceptable effects to aquatic organisms and their uses if the one-hour concentration does not exceed the value more than once every three years on the average;

"acute toxicity" means the degree to which a pollutant, discharge, or water sample causes a rapid adverse impact to aquatic organisms;

"ambient conditions" means the water quality condition that would occur~~occurs~~ in the receiving waters ~~of interest when if~~ these waters are~~were~~ not influenced by ~~the any~~ proposed new human activity or discharge;

"animal pen" refers to an animal feeding operation (AFO) facility or lot (other than an aquatic animal production facility) which is separate from any waste treatment facilities.

where animals have been, are, or will be stabled or confined and fed or maintained;

“ASAC” means the American Samoa Administrative Code;

“ASCA” means the American Samoa Code Annotated;

“AS-EPA” means the American Samoa Environmental Protection Agency, (AS-EPA)” means the agency responsible for implementation and enforcement of Water Quality Standards in American Samoa;

“ASG” means the American Samoa Government;

~~“class I waters” means fresh surface waters above impoundments or diversions of water which may be used as a potable water supply;~~

~~“class II waters” means all fresh surface waters that are not class I;~~

“chronic exposure value” means the threshold value at or below which there should be no unacceptable effects to aquatic organisms and their uses if the four-day concentration does not exceed that value more than once every three years on the average;

“chronic toxicity” means the degree to which a pollutant, discharge, or water sample causes a long-term adverse impact to aquatic organisms, such as an alteration in growth rate or reproduction;

“class I waters” means fresh surface waters above impoundments or diversions of water which may be used as a potable water supply;

“class II waters” means all fresh surface waters that are not class I;

“Clean Water Act” or “CWA” means the Federal Water Pollution Control Act;

“discharge of a pollutant” means any addition of any pollutant to the waters of American Samoa from any point source;

“embayment” means a body of water subject to tidal action and bounded by headlands which restrict the exchange of water with the open ocean. A bay or lagoon is an embayment if the ratio of the volume of water (cubic feet) to the cross-sectional area (square feet) at the entrance is more than 700, when determined at mean lower low water. Embayments include Pago Pago Harbor, Fagatele Bay, Pala Lagoon, Afono Bay, Fagasa Bay, Masefau Bay, and Vatia Bay.

~~“Environmental Quality Commission (EQC)”~~ means the Environmental Quality Commission of the American Samoa Government ~~(ASG)~~ and its authorized agents;

“fresh surface waters” means all fresh territorial waters including perennial, intermittent, and ephemeral freshwater streams, all natural and artificial impoundments, springs, seeps and wetlands, including coastal wetlands not surface-connected to the ocean. This includes all surface territorial waters that are not embayments, open coastal waters, or ocean waters;

“geometric mean” is defined as n^{th} root of the products of C_1 to C_n in which n is the number of samples analyzed during the period and C is the concentration of the parameter found in each sample. The geomean is calculated by taking the \log_{10} of sample values, averaging those values and the raising the average to the power of 10;

“ground water” means water in the part of the ground that includes all subsurface waters, basal and parabasal water, perched water, water percolating through the unsaturated zone, and all saline waters below and along the perimeter of the basal fresh water body;

“hazardous materials” means any material that poses a threat to human health and/or the environment when improperly managed, including toxic, corrosive, ignitable, explosive or chemically reactive substances;

“light penetration depth” means the depth reached by one percent of the sunlight incident on the surface of a body of water-;

“NPDES” means the National Pollutant Discharge Elimination System;

“natural conditions” describes the quality of surface and marine water reasonably assumed to be not influenced by human-caused pollution or disturbance; ~~means free of substances or conditions, which are attributable to the activities of man;~~

“nonpoint source pollution” is defined as pollution caused by sediments, nutrients and organic and toxic substances originating from land use activities and/or from the atmosphere, which are carried to receiving waters by runoff at a rate that exceeds natural reference condition levels;

“ocean waters” means those waters that extend from the 100-fathom (600-foot or 183-meter) depth contour seaward;

“open coastal waters” means those waters that begin at the shoreline and extend seaward to the 100-fathom (600-foot or 183-meter) depth contour from mean lower low

water. This category includes small bays with good water movement which do not qualify as embayments;

“Pago Pago Harbor” is defined as landward of a line drawn from Niuloa Point to Breaker’s Point;

“Pala Lagoon” is defined as that body of water inside a line drawn from the eastern most point of the airport to the nearest part of Coconut Point;

“person” means any individual, partnership, firm, state, federal government, association, municipality, public or private corporation, subdivision or agency of the territory, trust, estate or any other legal entity or interstate body;

“point source” means any discernible, confined, and discrete conveyance including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged;

“pollutant” means dredged spoil, sediment, solid waste, petroleum product, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical waste, biological material, radioactive material, heat, wrecked or discarded equipment, rock, sand, excavated material, or industrial, municipal, and agricultural waste discharged into water;

“pollution” means the manmade or man induced alteration of the physical, chemical, biological, or radiological condition of territorial waters;

“process waste water” means any water which comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by product, or waste product during manufacturing or processing operations;

“reference conditions” describes the characteristics of water body segments least impaired by human activities, where the influence of human activities is reasonably assumed to be present. As such, reference conditions can be used to describe attainable biological or habitat conditions for water body segments with common watershed or catchment characteristics within defined water body classes;

“Statistical Threshold Value” means the approximation of the 90th percentile of the water quality distribution;

“Territorial waters” means waters of the United States as defined in 40 CFR 122.2, as well as those that are located within the jurisdiction of the territory;

"wetlands" mean those areas that are inundated or saturated by ground or surface water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include, but are not limited to, swamps, marshes, mangroves, streams, springs, cultivated marshes, and similar areas;

"zone of initial dilution" or "ZID" is that area of a plume where dilution is achieved due to the combined effects of momentum and buoyancy of the effluent discharged from an orifice. Unless otherwise approved by the EQC and US EPA, the zone of initial dilution and initial dilution ratio shall be determined using the latest version of the PLUMES model UM (EPA/600/R-93/139) UDKHDEN model (EPA/600/3-85-073a,b), assuming zero ambient current and representative ambient reference condition concentrations of the pollutant in question;

"zone of mixing" or "ZOM" means a defined portion of a water body receiving water around a point source within which specific modifications of applicable water quality standards are permitted by the EQC.

§24.0202 Policy on Water Quality Antidegradation

(a) It is the policy of the Environmental Quality Commission (EQC) that existing water uses and the level of water quality necessary to protect existing uses shall be maintained. Any water quality degradation which would interfere with or become injurious to these existing uses is prohibited. Existing uses are those uses identified in these standards.

(b) Waters whose existing quality exceeds the level necessary to support existing uses shall not be degraded unless and until the EQC finds, after full satisfaction of the intergovernmental coordinating and public participation provisions contained in the Environmental Quality Act (ASCA Title 24, ~~ASGA~~), that allowing lower water quality is necessary to accommodate important economic or social needs of the Territory. In no event, however, may water quality be degraded to an extent that it would interfere with or become injurious to existing uses.

(c) No further degradation shall be allowed in waters which constitute an outstanding public resource or in waters of exceptional recreational or ecological significance. Waters which receive this protection shall be classified as unique waters by the EQC.

(d) Subject to the provisions of sections (a)-(c) above, the EQC may allow limited degradation if it is determined that all the following criteria are met:

- (1) The proposed degraded level of water quality will support existing uses;
- (2) A compelling economic or social need of the Territory is served by allowing limited degradation;
- (3) The highest practicable statutory and regulatory requirements will be met by existing and new point sources of pollutants; and
- (4) All cost-effective and reasonable best management practices for non-point sources of pollutants will be achieved.

(e) In those cases where potential water quality impairment is associated with a thermal discharge, nothing in these regulations or their implementation shall be inconsistent with Section 316 of the Clean Water Act.

(f) In carrying out its responsibilities under these standards, the EQC and AS-EPA will undertake such activities and studies as may be necessary to implement the above policies. These activities and studies may include, but are not limited to: (1) monitoring the quality of water and the impacts of pollutant discharges; (2) requiring appropriate levels of treatment and other pollutant control measures through conditions placed on water quality certifications ([ASAC § 24.0209](#)) and other approvals granted by the EQC; and (3) performing inspections and, as necessary, undertaking enforcement actions to assure compliance.

§24.0203 Authority

These standards are adopted under the provisions of the ~~Territorial~~ American Samoa Environmental Quality Act. [ASCA, Title 24, Chapter 1.](#)

§24.0204 Standards Review

The EQC may revise these standards at any time ~~following applicable APA procedures in accordance with the American Samoa Administrative Procedures Act (APA)~~, as set forth in [ASCA, Title 04, Chapter 10, ASCA and the US EPA public participation regulation, as set forth in 40 CFR part 25 and 40 CFR part 131.](#) The EQC will submit any such revisions to US_EPA in accordance with §303(c) of the ~~Federal Water Pollution Control Act CWA.~~, as amended.

§24.0205 Water Classifications - Protected and Prohibited Uses

(a) Prohibited uses and activities applicable to all waters:

- (1) Dumping of solid waste, including dead animals, directly into the water or in a manner that could reasonably be expected to adversely affect water quality;

- (2) The discharge of oil, sludge, oil refuse, fuel oil, or bilge waters directly into the water or in a manner that could reasonably be expected to adversely affect water quality;
- (3) The discharge of toxic, hazardous or radioactive waste directly into the water or in a manner that could reasonably be expected to adversely affect water quality;
- (4) The dumping or discharge of industrial, domestic or animal waste except as approved by the EQC and, as applicable, permitted by the US EPA; and
- (5) Whole and limited body-contact recreation, e.g., swimming, snorkeling, surfing, and scuba diving within any zone of mixing.

(b) Fresh Surface Waters

(1) Class 1 Fresh Surface Waters

(A) Class 1 waters are to remain in as near their natural state as possible with a minimum of pollution from any human activity. Protected uses of these waters are: potable water supplies, support and propagation of indigenous aquatic and terrestrial life, and compatible recreation and aesthetic enjoyment.

(B) Prohibited uses and activities include, but are not limited to:

- (i) Point source discharges of pollutants;
- (ii) Dredging and filling activities;
- (iii) Bathing, including washing clothes and dishes;
- (iv) Animal pens over or within 100 feet of the water body;
- (v) Siting of septic tanks including drain fields within 200 feet of the water body;
- (vi) Land disturbing (e.g., grading, tillage) activities within 100 feet of the water body; and
- (vii) Wood cutting or clearing within 100 feet of the water body.

(2) Class 2 Fresh Surface Waters

(A) Class 2 waters shall be protected for the support and propagation of indigenous aquatic life, recreation in and on the water, and aesthetic enjoyment.

(B) Prohibited uses and activities include, but are not limited to:

- (i) Point source discharges of pollutants except as approved by the EQC. No zones of mixing will be granted;
- (ii) Dredging or filling activities, except as approved by EQC;

- (iii) Bathing, including washing clothes and dishes;
- (iv) Animal pens over or within 50 feet of the water body;
- (v) Siting of septic tanks:
 - (a) Hollow block constructed tanks within 50 feet of the water body;
 - (b) Cast-in-place concrete tanks within 30 feet of the water body;
 - (c) Molded plastic tanks (e.g., high-density polyethylene ~~or~~ (HDPE) within 20 feet of the water body.
- (vi) Siting of ~~including~~ septic tank drain fields within 50 feet of the water body.
- (vii) Land disturbing (e.g., grading, tillage) activities within 50 feet of the water body; and
- (viii) Wood cutting or clearing within 50 feet of the water body.

(c) Ground Waters

(1) Class 1G Ground Waters

(A) Class 1G groundwaters are current or potential supplies of potable water and their associated recharge areas and shall be protected as potable water supplies. Unless otherwise identified, Class 1G groundwaters include all ground water with a naturally occurring salinity of less than 10,000 mg/l.

(B) Prohibited uses and activities include, but are not limited to:

- (i) Direct discharge of any waste through injection wells;
- (ii) The surface or subsurface discharge of industrial waste;
- (iii) Dumping or landfilling of solid waste on the surface or subsurface; and
- (iv) The surface or subsurface discharge of treated industrial, human or animal waste, except through treatment and disposal devices or systems approved by EQC.

(2) Class 2G Ground Waters

(A) Class 2G groundwaters are waters with naturally occurring salinities of 10,000 mg/l or more, or other groundwaters not designated as class 1G.

(B) Prohibited uses and activities include, but are not limited to:

- (i) The surface or subsurface discharge of industrial, human or animal waste, except through treatment and disposal systems approved by the

EQC.

(d) Wetlands

(1) All wetlands are to remain in as near their natural state as possible and shall be protected to support the propagation of indigenous aquatic and terrestrial life, recreation and subsistence fishing, food cultivation and gathering, aesthetic enjoyment, recreation in an on water, flood control, and recharge of groundwaters.

(2) Prohibited uses and activities include, but are not limited to:

- (A) Point source discharges of pollutants;
- (B) Dredging and filling activities, except as approved by the EQC;
- (C) Animal pens directly over or within 50 feet of the wetland; and
- (D) Siting of septic tanks including drain fields within 50 feet of the wetland.

(e) Embayments

All embayments are to remain in as nearly their natural state as possible.

(1) Pago Pago Harbor: Pago Pago Harbor has been designated by the American Samoa Government to be developed into a transshipment center for the South Pacific. Recognizing its unique position as an embayment where water quality has been degraded from the natural condition, the EQC has established a separate set of standards for Pago Pago Harbor.

(A) Protected uses for Pago Pago Harbor:

- (i) Recreational and subsistence fishing except for exclusions as specified under federal regulations such as no take zones;
- (ii) Boat-launching ramps and designated mooring areas;
- (iii) Subsistence food gathering; e.g. shellfish harvesting except for exclusions as specified under federal regulations such as no take zones;
- (iv) Aesthetic enjoyment;
- (v) Whole and limited body-contact recreation, e.g. swimming, snorkeling, and scuba diving;
- (vi) Support and propagation of marine life;
- (vii) Industrial water supply;
- (viii) Mari-culture development except for exclusions as specified under federal regulations such as no take zones;
- (ix) Normal harbor activities; e.g. ship movements, docking, loading and

unloading, marine railways and floating drydocks; and
(x) Scientific investigations.

(B) Prohibited uses include but are not limited to:

- (i) Dumping or discharge of solid waste;
- (ii) Animal pens over or within 50 feet of any shoreline;
- (iii) Dredging and filling activities; except as approved by the EQC;
- (iv) Toxic, hazardous and radioactive waste discharges; and
- (v) Discharge of oil sludge, oil refuse, fuel oil, or bilge water, or any other wastewater from any vessel or unpermitted shoreside facility.

(C) Zones of mixing may be granted in Pago Pago Harbor by the EQC, however, no zones of mixing will be allowed within 500 feet of Goat Island Point or beneath this surface area to the bottom of the harbor.

(2) Special Embayments

(A) Fagatele Bay is designated as marine sanctuary by the U.S. Department of Commerce because of pristine water quality, remote location, and rich underwater resources. Therefore, the EQC has assigned specific water quality standards to prohibit any reduction in water quality in the bay.

(B) [Nu'uuli](#) Pala Lagoon is a shallow embayment that is important as a breeding ground for the marine life of the ~~t~~Territory. It has been designated by the American Samoa Coastal Management Plan Rules as a special management area. Therefore, the EQC has also classified the [Nu'uuli](#) Pala Lagoon as a special embayment.

(C) Protected uses:

- (i) Recreational and subsistence fishing except for exclusions as specified under federal regulations such as no take zones;
- (ii) Subsistence food gathering, e.g. shellfish harvesting except for exclusions as specified under federal regulations such as no take zones;
- (iii) Aesthetic enjoyment;
- (iv) Whole and limited body-contact recreation, e.g. swimming, snorkeling, surfing, and scuba diving;
- (v) Support and propagation of marine life;
- (vi) Mari-culture development except for exclusions as specified under federal regulations such as no~~t~~ take zones; and

(vii) Scientific investigations.

(D) Prohibited uses include but are not limited to:

- (i) Dumping or discharge of solid or industrial waste materials;
- (ii) Animal pens over or within 50 feet of any shoreline;
- (iii) Dredging and filling activities, except when approved by the EQC;
- (iv) Toxic, hazardous and radioactive waste discharges; and
- (v) Discharge of oil sludge, oil refuse, fuel oil, or bilge water, or any other wastewater from any vessel or unpermitted shoreside facility.

(E) Zones of mixing will not be allowed in Pala Lagoon or Fagatele Bay.

(3) Other Embayments: All embayments of the Territory excluding Pago Pago Harbor, Pala Lagoon, and Fagatele Bay are included in this category.

(A) Protected uses:

- (i) Recreational and subsistence fishing except for exclusions as specified under federal regulations such as no take zones;
- (ii) Boat-launching ramps and designated mooring area;
- (iii) Subsistence food gathering; e.g. shellfish harvesting except for exclusions as specified under federal regulations such as no take zones;
- (iv) Aesthetic enjoyment;
- (v) Whole and limited body-contact recreation, e.g., bathing, swimming, snorkeling, surfing, and scuba diving;
- (vi) Support and propagation of marine life; and
- (vii) Mari-culture development except for exclusions as specified under federal regulations such as no take zones.

(B) Prohibited uses include but are not limited to:

- (i) Dumping or discharge of solid or industrial waste material;
- (ii) Animal pens over or within 50 feet of any shoreline;
- (iii) Dredging and filling activities, except when approved by EQC;
- (iv) Toxic, hazardous and radioactive waste discharges; and
- (v) Discharge of oil sludge, oil refuse, fuel oil, or bilge water from any vessel or shoreside facility.

(C) Zones of mixing may be granted in the embayments included in this paragraph by EQC.

(f) Open Coastal Waters

(1) Protected uses:

- (A) Commercial, subsistence, and recreational fishing except for exclusions as specified under federal regulations such as no take zones;
- (B) Scientific investigations;
- (C) Whole and limited body-contact recreation, e.g., swimming, snorkeling, surfing, and scuba diving;
- (D) Harbors and boat-launching ramps;
- (E) Commercial and recreational boating;
- (F) The support and propagation of marine life; and
- (G) Aesthetic enjoyment.

(2) Prohibited uses include but are not limited to:

- (A) Offshore oil recovery;
- (B) Dumping or discharge of solid or industrial waste material;
- (C) Discharge of oil sludge, oil refuse, fuel oil, bilge waters, or any other wastewater from any vessel or unpermitted shore-side facility;
- (D) Animal pens over or within 50 feet of any shoreline;
- (E) Dredging and filling activities except when approved by the EQC;
- (F) Toxic, hazardous and radioactive waste discharges; and
- (G) Point source discharges in Manu'a off Ofu Park and between Ofu Park and the Ofu-Olosega Bridge within 1,000 feet of the bridge.

(g) Ocean Waters

(1) Protected uses:

- (A) Commercial, subsistence, and recreational fishing except for exclusions as specified under federal regulations such as no take zones;
- (B) Scientific investigations;
- (C) Commercial and recreational boating;
- (D) The support and propagation of marine life;
- (E) Aesthetic enjoyment; and
- (F) Whole or limited body-contact recreation.

(2) Prohibited uses include but are not limited to:

- (A) Discharge of oil sludge, oil refuse, fuel oil, bilge waters, or any other wastewater from any vessel;
- (B) Dumping of solid or industrial waste materials without an EPA ocean dumping permit, except as approved by EQC under exclusions in the federal ocean dumping regulations; and
- (C) Toxic, hazardous and radioactive waste discharges.

§24.0206 Standards of Water Quality

The following standards apply to all territorial and ground waters including but not limited to fresh surface waters, ground waters, embayments, open coastal waters, and oceanic waters of the territory, except as otherwise provided in §24.0207 (Zones of Mixing):

(a) They shall be substantially free from materials attributable to sewage, industrial wastes, or other activities of man that will produce objectionable color, odor, or taste, either of itself or in combinations, or in the biota;

(b) They shall be substantially free from visible floating materials, grease, oil, scum, foam, and other floating material attributable to sewage, industrial wastes, or other activities of man;

(c) They shall be substantially free from materials attributable to sewage, industrial wastes, or other activities of man that will produce visible turbidity or settle to form objectionable deposits;

(d) They shall be substantially free from substances and conditions or combinations thereof attributable to sewage, industrial wastes, or other activities of man which may be toxic to humans, other animals, plants, and aquatic life or produce undesirable aquatic life;

(e) The temperature shall not deviate more than 1.5 degrees Fahrenheit from conditions which would occur naturally and shall not fluctuate more than ~~4-degree~~1-degree Fahrenheit on an hourly basis or exceed 85 degreess Fahrenheit due to the influence of other than natural causes;

(f) Radioactivity:

- (1) Since human exposure to any ionizing radiation is undesirable, the concentration of radioactivity in ~~any~~natural waters will be maintained at the lowest practicable level.

(2) No radioactive materials shall be present in ~~any~~natural waters as a consequence of the failure of an installation to exercise appropriate controls to eliminate releases.

(3) The concentration of radioactivity shall not:

(A) result in accumulations or radioactivity in edible plants and animals that present a hazard to consumers or are harmful to aquatic or terrestrial life, as recommended by the Federal Radiation Council in the "Radiation Protection Guides";

(B) exceed 1/30 of the maximum permissible concentrations (MPC) values given for continuous occupational exposures in the National Bureau of Standards "Handbook No. 69", as revised; or

(C) exceed the current National Primary Drinking Water Regulations for waters used for public or domestic water supplies.

(g) Toxic Substances:

(1) Class 1 Surface Waters and Class 1G Groundwater.

The concentration of toxic pollutants shall not exceed the more stringent of the aquatic life criteria for freshwater or the human health concentration criteria for consumption of water and organisms –in the priority toxic pollutant table of the National Recommended Water Quality Criteria 2002, EPA-822-R-02-047, November 2002 (EPA 2002) or the most recent version.

(2) Class 2 Surface Water and Wetlands.

The concentration of toxic pollutants shall not exceed the more stringent of the aquatic life criteria for freshwater or the human health concentration criteria for consumption of water and organisms found in EPA 2002 or the most recent version.

(3) All Embayments, Open Coastal Waters and Ocean Waters.

Except as may be allowed by the EQC within a Zone of Mixing (ASAC § 24.0207), the concentration of toxic pollutants shall not exceed the more stringent of the aquatic life criteria for marine waters or the human health concentration criteria for consumption of organisms found in EPA 2002 or the most recent version.

(4) Subject to US EPA approval, the EQC may from time to time adopt site-specific toxic pollutant criteria. Any such adoption shall involve public participation and be based upon site-specific data and studies demonstrating that the alternate criteria will support the propagation of aquatic life and protect the public health.

(h) Toxicity Requirements - Acute and Chronic

(1) All effluents containing materials attributable to the activities of man shall be considered harmful unless acceptable bioassay tests have shown otherwise. In its discretion the EQC may require the person responsible for the discharge of the effluent to perform bioassay tests on the effluent in question.

(2) Compliance with §24.0206(d) of these standards will be determined using indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays, or other appropriate methods as specified by the EQC.

(3) The chronic effect on test organisms outside a zone of mixing, if one exists, in the water body receiving the effluent in question shall not be more than that for waters of the same water body that are unaffected by the discharge of pollutant, or, when necessary for other control water meeting the criteria described in the latest edition of "Standard Methods for the Examination of Water and Wastewater."

(4) Compliance with the above standards shall be evaluated with a 96-hour bioassay or short-term method for estimating chronic toxicity using methods described in the most recently updated versions of the following documents:

(A) EPA/821/R-02-013 Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, 2002.

(B) EPA/600/4-90-027F Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Cincinnati, Ohio, EMSL, Fourth Edition, 1993.

(C) EPA/600/R-95-136 Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, Cincinnati, Ohio, EMSL, 1995.

(i) There shall be no changes in basin geometry or freshwater inflow that will alter current patterns in such a way as to adversely affect existing biological populations or sediment distribution. To protect estuarine organisms, no change in channels, basin geometry, or freshwater influx shall be made which would cause permanent changes in existing isohaline patterns of more than 10 percent.

(j) The following additional toxic standards shall apply:

(1) Arsenic: The human health numeric criteria for arsenic in the EPA 2002 publication

are excluded from the American Samoa Water Quality Standards and instead, the American Samoa human health criteria for arsenic for freshwaters is 10 µg/l.

(2) Total Mercury: In addition to the methyl mercury criteria for human health from the EPA 2002 publication, the water column concentration of mercury shall not exceed 0.05 µg/l.

(3) Total Residual Chlorine: Total residual chlorine in any ambient water shall not exceed 11 micrograms per liter for fresh water and 7.5 micrograms per liter for marine waters.

(k) **Fresh surface waters.** The following standards apply specifically to all fresh surface waters of the territory:

Parameter	Median¹ not to exceed	Not to exceed more than 10% of the time	Not to exceed more than 2% of the time
Turbidity (NTU)	5	8	12
Total Phosphorus (µg/l as P)	175	390	635
Total Nitrogen (µg/l as N)	300	650	1000
Total Suspended Solids (mg/l)	5	10	15

¹Refer to most recent version of “AS-EPA Implementation Guidance Manual for ASWQS Numeric Criteria” for median calculation method.

Ammonia: The ammonia toxicity standards for fresh and marine waters are tabulated in Appendix A.

Dissolved Oxygen: Not less than 75% saturation or less than 6.0 mg/l. If the natural level of dissolved oxygen is less than 6.0 mg/l, the natural level shall become the standard. Concentration of dissolved oxygen shall not be decreased to less than 75% saturation at any time, as influenced by salinity or naturally occurring temperature variations. Where natural conditions cause lower dissolved oxygen levels, controllable water quality factors shall not cause further reductions.

pH: The pH range shall be 6.5 to 8.6 and be within 0.2 pH units of that which would occur naturally.

Enterococci: 35 per 100 ml (geometric mean indicator density)
130 per 100 ml (statistical threshold value)

E. coli: 126 per 100 ml (geometric mean indicator density)
410 per 100 ml (statistical threshold value)

(I) Embayments.

The following standards apply to all embayments except Pago Pago Harbor, Fagatele Bay and Pala Lagoon:

Parameter	Median¹ not to exceed	Not to exceed more than 10% of the time	Not to exceed more than 2% of the time
Turbidity (NTU)	0.35	0.45	0.60
Total Phosphorus (µg/l as P)	20	40	60
Total Nitrogen (µg/l as N)	150	250	350
Chlorophyll a (µg/l)	0.5	1.5	3.0
Light Penetration ² (feet)	120	100	75

¹Refer to most recent version of “AS-EPA Implementation Guidance Manual for ASWQS Numeric Criteria” for median calculation method.

²Light Penetration to exceed given values.

Ammonia: The ammonia toxicity standards for fresh and marine waters are tabulated in Appendix A.

Dissolved Oxygen: ~~Not less than 70% saturation or less than 5.0 mg/l. If the natural level of dissolved oxygen is less than 5.0 mg/l, the natural level shall become~~

the standard. Concentration of dissolved oxygen shall not be decreased to less than 80%70% saturation at any time, as influenced by salinity or naturally occurring temperature variations. Where natural conditions cause lower dissolved oxygen levels, controllable water quality factors shall not cause further reductions.

pH: The pH range shall be 6.5 to 8.6 and be within 0.2 pH units of that which would occur naturally.

Enterococci: 35 per 100 ml (geometric mean indicator density)
130 per 100 ml (statistical threshold value)

(m) Pago Pago Harbor

The following standards apply specifically to Pago Pago Harbor:

Parameter	Median¹ not to exceed	Not to exceed more than 10% of the time	Not to exceed more than 2% of the time
Turbidity (NTU)	0.75	1.0	1.5
Total Phosphorus (µg/l as P)	30	60	90
Total Nitrogen (µg/l as N)	200	350	500
Chlorophyll a (µg/l)	1.0	3.0	5.0
Light Penetration ² (feet)	65	45	35

¹Refer to most recent version of “AS-EPA Implementation Guidance Manual for ASWQS Numeric Criteria” for median calculation method.

²Light Penetration to exceed given values.

Ammonia: The ammonia toxicity standards for fresh and marine waters are tabulated in Appendix A.

Dissolved Oxygen: ~~Not less than 70% saturation or less than 5.0 mg/l. If the natural level of dissolved oxygen is less than 5.0 mg/l, the natural level shall become~~

the standard. Concentration of dissolved oxygen shall not be decreased to less than 80%~~70%~~ saturation at any time, as influenced by salinity or naturally occurring temperature variations. Where natural conditions cause lower dissolved oxygen levels, controllable water quality factors shall not cause further reductions.

pH: The pH range shall be 6.5 to 8.6 and be within 0.2 pH units of that which would occur naturally.

Enterococci: 35 per 100 ml (geometric mean indicator density)
130 per 100 ml (statistical threshold value)

(n) Embayments - Fagatele Bay and Pala Lagoon

The following standards apply specifically to Fagatele Bay and Pala Lagoon:

Parameter	Median¹ not to exceed	Not to exceed more than 10% of the time	Not to exceed more than 2% of the time
Turbidity (NTU)			
Fagatele Bay	0.25	0.35	0.50
Pala Lagoon	0.75	1.5	2.5
Total Phosphorus (µg/l as P)	15	36	60
Total Nitrogen (µg/l as N)	135	220	300
Chlorophyll a (µg/l)	0.35	0.60	1.0
Light Penetration ² (feet)	130	110	90

¹Refer to most recent version of “AS-EPA Implementation Guidance Manual for ASWQS Numeric Criteria” for median calculation method.

²Light Penetration to exceed given values.

Ammonia: The ammonia toxicity standards for fresh and marine waters are tabulated in Appendix A.

Dissolved Oxygen: ~~Not less than 80% saturation or less than 5.5 mg/l. If the natural level of dissolved oxygen is less than 5.5 mg/l, the natural level shall become the standard.~~ Concentration of dissolved oxygen shall not be decreased to less than 80% saturation at any time, as influenced by salinity or naturally occurring temperature variations. Where natural conditions cause lower dissolved oxygen levels, controllable water quality factors shall not cause further reductions.

pH: The pH range shall be 6.5 to 8.6 and be within 0.2 pH units of that which would occur naturally.

Enterococci: 35 per 100 ml (geometric mean indicator density)
130 per 100 ml (statistical threshold value)

(o) Open Coastal Waters

The following apply specifically to open coastal waters:

Parameter	Median¹ not to exceed	Not to exceed more than 10% of the time	Not to exceed more than 2% of the time
Turbidity (NTU)	0.25	0.35	0.45
Total Phosphorus (µg/l as P)	15	30	50
Total Nitrogen (µg/l as N)	130	210	280
Chlorophyll a (µg/l)	0.25	0.50	0.75
Light Penetration ² (feet)	130	110	90

¹Refer to most recent version of “AS-EPA Implementation Guidance Manual for ASWQS Numeric Criteria” for median calculation method.

²Light Penetration to exceed given values.

Ammonia: The ammonia toxicity standards for fresh and marine waters are tabulated in Appendix A.

Dissolved Oxygen: ~~Not less than 80% saturation or less than 5.5 mg/l. If the natural level of dissolved oxygen is less than 5.5 mg/l, the natural level shall become the standard. Concentration of dissolved oxygen shall not be decreased to less than 80% saturation at any time, as influenced by salinity or naturally occurring temperature variations. Where natural conditions cause lower dissolved oxygen levels, controllable water quality factors shall not cause further reductions.~~

pH: The pH range shall be 6.5 to 8.6 and be within 0.2 pH units of that which would occur naturally.

Enterococci: 35 per 100 ml (geometric mean indicator density)
130 per 100 ml (statistical threshold value)

(p) Ocean Waters

The following apply specifically to ocean waters:

Parameter	Median¹ not to exceed	Not to exceed more than 10% of the time	Not to exceed more than 2% of the time
Turbidity (NTU)	0.20	0.29	0.36
Total Phosphorus (µg/l as P)	11	23	35
Total Nitrogen (µg/l as N)	115	180	230
Chlorophyll a (µg/l)	0.18	0.40	0.65
Light Penetration ² (feet)	150	132	120

¹Refer to most recent version of “AS-EPA Implementation Guidance Manual for ASWQS Numeric Criteria” for median calculation method.

²Light Penetration to exceed given values.

Ammonia: The ammonia toxicity standards for fresh and marine waters are

tabulated in Appendix A.

Dissolved Oxygen: ~~Not less than 80% saturation or less than 5.5 mg/l. If the natural level of dissolved oxygen is less than 5.5 mg/l, the natural level shall become the standard.~~ Concentration of dissolved oxygen shall not be decreased to less than 80% saturation at any time, as influenced by salinity or naturally occurring temperature variations. Where natural conditions cause lower dissolved oxygen levels, controllable water quality factors shall not cause further reductions.

pH: The pH range shall be 6.5 to 8.6 and be within 0.2 pH units of that which would occur naturally.

Enterococci: 35 per 100 ml (geometric mean indicator density)
130 per 100 ml (statistical threshold value)

(q) Implementation Provisions for Numeric Criteria

Compliance with numeric criteria shall be determined in accordance with the most recent version of "AS-EPA Implementation Guidance Manual for ASWQS Numeric Criteria".

Refer to the most recent version of "Territory of American Samoa Integrated Water Quality Monitoring [Andand](#) Assessment Report" for use support evaluation methodology including 303d listing.

(r) Biocriteria

The Territory shall preserve, protect, and restore water resources to as near their ~~most~~ natural condition. The condition of these waterbodies shall be determined from measures of physical, chemical, and biological characteristics of each waterbody type, according to its designated use. As a component of these measures, the biological integrity of the benthic communities living within waters shall be assessed by comparison to reference conditions(s) with similar abiotic and biotic environmental settings that represent the optimal or least impacted condition for that system. Such reference conditions shall be those observed to support the greatest community evenness, diversity, and abundance of aquatic life as is expected to be or has been historically found in natural settings essentially undisturbed or minimally disturbed by human impacts, development, or discharges. This condition shall be determined by consistent sampling and reliable measures of selected indicator communities of flora and/or fauna and may be used in conjunction with other measures of water quality. Waters shall be of a sufficient quality to support a resident biological community as defined by metrics derived based upon reference conditions. These narrative biological criteria shall apply to fresh water, wetlands, estuaries, and coral reefs and other marine conditions based

upon their respective reference conditions and metrics.

§24.0207 Zones of Mixing

(a) Policy: Zone of mixing

Human activities may result in the practical need to discharge pollutants through point sources into the waters of the territory. And, because of technological, economic and other factors, it may not always be feasible to achieve an effluent quality that equals or exceeds the standards established herein at the point of discharge. Therefore, subject to the prohibitions, criteria and procedures set forth below, alternate water quality standards may be defined by the EQC in the immediate vicinity surrounding the point of discharge. The area within which the alternate standards apply shall be a zone of mixing. All applicable water quality standards shall be met at the boundary of any zone of mixing.

It is the policy of the EQC that zones of mixing shall only be granted upon a finding that no other practicable means of waste treatment and disposal are available. Further, it is the policy of the EQC that zones of mixing shall be limited to the smallest area possible.

(b) Criteria: Zone of Mixing

A zone of mixing can only be granted by the EQC if the application and the supporting information clearly shows that all of the following conditions and criteria have been met:

(1) It is in the public interest that a zone of mixing be granted to begin or continue the function or operation associated with the discharge;

(2) The proposed discharge does not substantially endanger human health or safety, or the environment;

(3) Compliance with the existing water quality standards at the point of discharge would produce serious economic hardships without equal or greater benefit to the public;

(4) Alterations generated by a proposed discharge do not disrupt the marine ecology of the receiving waters outside the zone of mixing;

(5) A zone of mixing shall not be granted for fresh surface waters, [Nu'uuli](#) Pala Lagoon, Fagatele Bay, that portion of Pago Pago Harbor described in §24.0205(e)(1)(C), or in those waters in Manu'a described in §24.0205(f)(2)(G);

(6) The size of any zone of mixing granted for any toxic pollutant shall not exceed the dimensions and volume of the zone of initial dilution and in no event shall the concentration of a toxic pollutant exceed chronic toxic levels at the boundary of the zone of initial dilution

(ZID). Except for limited portions of the ZID, acute toxic standards shall be achieved within the ZID;

(7) The standards set forth in §24.0206(a)-(d) shall be met at the boundary of the zone of initial dilution;

(8) Alternate standards may be established within a ~~Z~~zone of ~~M~~mixing for those standards set forth at §§24.0206(h),(j),(l),(m),(o), and (p); provided that the standards shall be met at the boundary of the ~~Z~~zone of ~~M~~mixing;

(9) A zone of mixing shall not be granted if it would include the surface of the water body, any part of the shoreline, or any part of any barrier or fringing reef; and

(10) Further, the following shall be considered by the EQC in determining whether to grant or deny a zone of mixing:

- (A) Protected uses of the body of water;
- (B) Existing ~~ambient~~~~natural~~ conditions of the receiving water;
- (C) Character of the effluent;
- (D) Adequacy of the design of the outfall and diffuser system to achieve the desired dispersion and assimilation in the receiving waters; and
- (E) Other pertinent policies, plans or territorial agencies.

(c) Procedures to Apply for Zone of Mixing

(1) The owner and/or operator of a point source of pollutants where the effluent quality of the discharge does not meet the applicable standards defined in §24.0206 at the point of discharge shall be in violation of these standards until such time as the EQC grants a zone of mixing upon receiving and acting upon an application for a zone of mixing from the discharger. At its discretion the EQC may grant extensions to discharges existing on the effective date of these standards, but in no event shall an existing discharge requiring a zone of mixing continue to discharge if a complete application for a zone of mixing has not been submitted to the EQC within 180 days of the effective date of these standards.

(2) Every application for a zone of mixing shall be accompanied by a complete and detailed description of:

- (A) the nature of the discharge including, but not limited to, volume, effluent quality, discharge location and configuration, and treatment applied;
- (B) ~~existing~~~~present~~ ambient water quality conditions in the vicinity of the discharge;
- (C) how present conditions compare to standards;
- (D) proposed alternate water quality standards within the proposed zone of mixing;

- (E) proposed dimensions and volume of the zone ~~on~~ of mixing;
- (F) a calculation of the dimensions and volume of the zone of initial dilution and the dilution ratio achieved at the boundaries of the zone of initial dilution;
- (G) the reasons why it is not practicable to achieve water quality standards for any specific parameter at the point of discharge or to eliminate the discharge and why the operation of the discharge is in the best interest of the territory; and
- (H) such other information as the EQC prescribes.

(3) Each application for a zone of mixing shall be reviewed in light of descriptions, statements, plans, histories, and other supporting information as may be submitted in the application or upon the request of the EQC and the effect on the water quality standards established in §24.0206.

(4) A zone of mixing, or a renewal, may be granted upon the EQC's determination that the requirements of these standards have been met for the following time periods and conditions:

(A) If a zone of mixing is granted on the grounds that there is no technically and/or financially efficient means known or available for elimination or adequate prevention, control, or abatement of the discharge involved, it shall be only until the necessary means of prevention, control, or abatement becomes practicable and it shall be subject to the taking of substitute or alternative measures that the EQC may prescribe. No renewal of a zone of mixing granted under this section shall be allowed without a thorough review of known and available means of preventing, controlling of abating the discharge involved;

(B) The EQC may grant a zone of mixing for a period not exceeding 5 years, —subject to be reopened if these water quality standards are revised during the 5-year period;

(C) Every zone of mixing granted under this section may include, but not be limited to, applicant requirements to perform effluent and receiving water sampling and testing as specified by the EQC and to report the results to the EQC. A program of research to develop practicable alternatives to the methods of treatment or control in use by the applicant may be required as a condition of the granting of the zone of mixing; and

(D) Upon application any zone of mixing granted pursuant to this section may be renewed periodically for periods not exceeding 5 years, provided, that:

- (i) the applicant for renewal has met all of the conditions specified in the previously prescribed zone of mixing;
- (ii) no renewal shall be granted except upon application. Any such application shall be made at least 120 days prior to the expiration of the current zone of mixing;
- (iii) upon timely application for renewal, the terms and conditions of the original

zone of mixing shall remain in effect until such time as the EQC acts upon the application for renewal; and

(iv) if no timely application for renewal is made, the zone of mixing shall automatically expire.

(5) The EQC, on its own motion or upon the application of any person, shall terminate a zone of mixing if, after a hearing, it is determined that:

(A) the water quality outside the zone of mixing does not meet the standards applicable to that water as given in §24.0206;

(B) the zone of mixing granted has interfered with any protected uses of the water area; or

(C) any NPDES permit condition has not been met and the discharger has failed to take prudent action to bring the discharge into compliance.

Such termination shall be made after a hearing held by the EQC in accordance with ASCA, Title 04, Chapter 10, ~~ASCA~~. Upon such termination, the standards of water quality applicable shall be those established in §24.0206.

(6) The granting of a mixing zone shall be subject to approval by US EPA.

§24.0208 Pollution Control

(a) General

Any private or public development which would constitute a source of pollution to the waters of American Samoa shall provide the degree of waste treatment and/or operational and management practices necessary to preserve the quality of these waters.

(b) Land Disturbing Activities

Soil particles resulting from erosion on land involved in earth work, such as the construction of public works, highways, subdivisions, private developments, and recreational, commercial, or industrial developments, or the cultivation and management of agricultural lands, shall be prevented from entering any waters of American Samoa by application of management practices and standards in accordance with the most recent version of "American Samoa Erosion and Sediment Control Field Guide" adopted by AS-EPA and implemented by the person(s) responsible. These practices include, but are not limited to:

(1) Best management practices (BMPs) for cultivated agricultural lands. The responsible person(s) shall implement BMPs to assure removal of settleable solids originating from the cultivated area. In so doing, the responsible person(s) shall:

(A) Utilize guidelines established by AS-EPA and the erosion component of the Conservation Management System as defined in the Field Office Technical Guide of the US Department of Agriculture, the Natural Resources Conservation Service, and/or guidance from AS-EPA. In the alternative, the responsible person(s) may design and install a combination of management and physical practices to remove the settleable solids and associated pollutants in runoff delivered from the contributing area for storms up to and including a ten-year, 24-hour frequency.

(B) For cultivated areas in excess of one acre and/or within 100 feet of a surface water or such other areas as AS-EPA may specify, prepare and submit an erosion and sediment control plan to the AS-EPA for approval. The AS-EPA shall either approve, conditionally approve or disapprove the plan. Cultivation activities ongoing as of the effective date of these standards may not proceed for more than 90 days in the absence of an approved plan. No new activity may commence until such time as AS-EPA has approved the plan.

(2) BMPs for construction sites. The responsible person(s) implementing BMPs at construction sites shall:

(A) Assure that the annual total suspended solids loading from a construction site is no greater than the average annual loading prior to construction or after construction is complete and the site is permanently stabilized;

(B) Reduce annual average suspended solids loading by 80 percent based on total suspended solids loading from storms less than or equal to the 2-year/24-hour storm;

(C) For construction activities disturbing in excess of one acre or occurring within 100 feet of a surface water, ensure that the standards set forth in subdivisions (A) and (B) are met, or, in the alternative, prepare and submit a construction and post-construction erosion and sediment control plan for approval by AS-EPA. For approval, the BMPs to be included in the plan must be those provided by the ["Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters" \(January 1993, USEPA OW\)](#)~~(g) Guidance document~~, guidance received from AS-EPA or the Natural Resources Conservation Service, or other references, as approved by AS-EPA. For construction activities disturbing in excess of one acre or within 100 feet of a surface water that are initiated after the effective date of these standards, the plan shall include measures to retain sediment on the site.

(c) On Site Disposal Systems

(1) No person may site, construct, or operate an on site disposal system except in accordance with public health rules, building codes, water quality standards, and sewer use regulations of the Territory. Failure to do so shall constitute a violation of these standards.

(2) Installation of on site disposal systems that reduce total nitrogen loading by 50 percent to ground water that is closely hydrologically connected to surface water will be required if conditions indicate that nitrogen limited surface waters may be adversely affected by excess nitrogen loading.

(d) Animal Waste Control

Improper waste disposal and contaminated runoff from confined animal facilities contribute nutrients, bacteria, viruses, other microorganisms, and sediment to streams, near shore and ground waters that lead to eutrophication, fish kills, and unsafe drinking water. In order to prevent these impacts, owners of confined animal facilities shall:

(1) Utilize animal waste control facilities that provide waste treatment, such as septic tanks and leach fields, waste storage ponds, waste storage structures, application of manure or runoff water to agricultural land, waste utilization, burial, or any other method determined to be environmentally acceptable by the Director of AS-EPA;

(2) Locate such facilities and their waste treatment facilities at least 50 feet from any [wetland, marine water body, or Class II fresh surface water except for the allowed siting of septic tanks and drain fields in §24.0205 \(b\)\(1\)\(B\)\(v\), §24.0205 \(b\)\(2\)\(B\)\(v\) and \(vi\), and §24.0205\(d\)\(2\)\(D\); and at least 100 ft. from any well head; ~~water body or stream;~~](#)

(3) Control all waste such that it will not contaminate near shore waters, streams, or ground waters; and

(4) Continuously operate and maintain animal waste control facilities to ensure effective treatment.

(e) Storm Water Control

To prevent negative impacts to receiving waters and ground waters as a result of disruption in natural drainage patterns caused by development, the following standards shall be required to control storm water for all new development projects and new or modified land uses in accordance with the most recent version of "AS-EPA Guidance Manual for Runoff Control":

(1) A storm water control plan shall be completed for any construction activity or temporary or permanent development determined by AS-EPA to have a potential significant impact on receiving water quality or ground water quantity or quality. Such activities include, but are not limited to, confined animal facilities, construction project staging areas, highways, bridges, parking lots, structures, and facilities utilizing hazardous materials, pesticides, fertilizers or manure. The storm water control plan required by this section shall be submitted

to AS-EPA and approved in writing prior to commencement of any construction activity for a new project and by the date specified by AS-EPA for existing land uses. The plan shall include the following:

(A) An estimate of the volume of storm water to be controlled, an assessment of the potential impacts of the storm water to be addressed, the design of BMPs and/or storm water controls, including a location map for the controls at the site, and a full description of the designs for the storm water controls.

(B) For nonstructural BMPs, a description of the management measures or methods to be used at the site to prevent the escape of pollutants to the receiving waters or ground waters. Nonstructural BMPs used in the plan shall be those contained in the ~~document (g) Guidance~~ [“Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters” \(January 1993, USEPA OW\)](#) or guidance from the AS-EPA, the Natural Resources Conservation Service, or other source as approved by AS-EPA.

(2) For the planning, development, and maintenance of new, modified, and existing land uses, avoidance and prevention of water quality impacts is required. The methods to be utilized include, but are not limited to, BMPs such as site planning, proper use, storage, and disposal of hazardous materials, avoidance of sensitive areas, and proper preparation and maintenance of drainage structures, or others as required by AS-EPA.

(f) Hydromodification

In order to prevent water quality degradation and preserve valuable in stream and riparian habitat, the following practices shall be required and/or implemented by AS-EPA:

(1) All projects involving hydromodification shall be evaluated to determine their impacts on the physical and chemical characteristics of surface waters as well as in stream and riparian habitat, using appropriate models and methodologies.

(2) BMPs for use in the design and/or operation of new or existing hydromodification structures shall be identified and implemented by responsible persons. BMPs include, but are not limited to, protection of existing vegetation, minimization of loads on top of stream banks, hydraulic structures, check dam systems, grade control structures, vegetative cover, in stream sediment load control, soil bioengineering, proper stream bank and shoreline erosion control design, and use of setbacks, as provided in the [“Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters” \(January 1993, USEPA OW\)](#) ~~(g) Guidance~~ or other references approved by AS-EPA.

(3) AS-EPA shall work with other ASG departments and the private sector to ensure the proper operation and maintenance of hydromodification structures; and

(4) Prior to commencing any hydromodification activity, authorization from AS-EPA must be received.

(g) Hazardous Materials and Chemical Control

Notwithstanding any other rules in force pertaining to hazardous materials management, the following BMPs shall be implemented at facilities or construction sites where hazardous materials such as petroleum products, solvents, paints, pesticides, fertilizers, soil additives, and other chemicals in excess are stored or utilized so that contamination of streams, near shore waters, and ground waters is minimized or prevented:

(1) Proper storage of hazardous materials. All hazardous materials and chemicals shall be stored within a covered shelter; an impervious berm with a capacity of 110 % of the largest container in the shelter shall be placed around the perimeter of the storage area; and appropriate construction measures shall be taken to prevent the runoff of pollutants;

(2) Proper labeling of chemicals and placement of warning signs in areas where pesticides are or have recently been applied;

(3) Proper disposal of hazardous chemicals or materials in conformance with AS-EPA guidelines and/or regulations promulgated by the EQC;

(4) Proper maintenance of vehicles, equipment, and machinery in confined areas specially designed to control runoff; and

(5) Proper application of fertilizers and manure using ~~AS-EPA recommended~~ procedures recommended by the [“Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters” \(January 1993, USEPA OW\)](#) document ~~(g) guidance, Natural Resources Conservation Service, or other source as approved by AS-EPA~~. Soil tests shall also be utilized to determine the specific nutrient needs at the site where such applications are performed in consultation with appropriate subject matter experts (e.g., Natural Resources Conservation Service).

(h) Dredging (Dredge and Dredge Spoil)

Dredging and dredged spoil discharges generally result in short-term disruption and do not represent continuous discharge that will affect beneficial uses over a long-term. Other in-water, construction-related activities, such as discharge from the dewatering of excavations and shoreline stabilization projects, can also cause short-term suspension of sediments similar to that caused by dredge and fill discharges. Effect zones may therefore be granted for dredging activities, other in-water construction-related activities, and the discharge of dredged or fill material provided that: (1) all other requirements of this Part are met; and (2)

the proposed activity satisfies the policy of water quality antidegradation found in §24.0202 of this document.

Dredging and discharge of dredged or fill material can adversely affect colonies of reef building organisms by burying them, by releasing contaminants such as hydrocarbons into the water column, by reducing light penetration through the water, and by increasing the level of suspended particulates. Coral organisms are extremely sensitive to even slight reductions in light penetration or increases in suspended particulates (i.e., turbidity). These adverse effects will cause a loss of productive colonies which in turn provide habitat for many species of highly specialized aquatic organisms.

Dredging and discharge of dredged or fill material can also adversely affect sea grass beds by smothering vegetation and benthic organisms, and may also create unsuitable conditions for their continued vigor by: (1) changing water circulation patterns; (2) releasing nutrients that increase undesirable algal populations; (3) releasing chemicals that adversely affect plants and animals; (4) increasing turbidity levels, thereby reducing light penetration and hence photosynthesis; and (5) changing the capacity of a vegetated shallow to stabilize bottom materials and decrease channel shoaling. Dredging and the discharge of dredged or fill materials may reduce the value of vegetated shallows as nesting, spawning, nursery, cover, and forage areas, as well as their value in protecting shorelines from erosion and wave actions. It may encourage the growth of nuisance vegetation.

In granting effect zones for dredging activities, the discharge of dredged or fill material, or other in-water, construction-related activities that cause the suspension of sediments in or near coral reef resources and sea grass beds, the EQC shall assure that any disruption to beneficial uses is kept to an absolute minimum, and that all practicable measures are taken to prevent adverse impacts to resources of concern, taking into consideration the magnitude and duration of the proposed activity, and the proximity to resources of concern. This shall be satisfied by placing conditions within the applicable permit or water quality certification requiring the following:

(1) The use and maintenance of Best Management Practices (BMPs) including such measures as "silt curtains", closed ("environmental") buckets, hydraulic dredges, or other methods as appropriate to control the drift and extent of suspended sediment plumes beyond the location of the dredge or fill activity;

(2) Water quality monitoring requirements for turbidity and other pollutants of concern that may be identified or expected in the dredge spoil or fill material. Periodic aquatic ecosystem monitoring may also be required for the purpose of assessing the effects of the activity on resources of concern and determining the necessity of additional mitigative measures;

(3) For activities which have the potential to adversely affect coral reproduction, a stoppage

period of no less than 60 days, starting 5 days after the October full moon, shall be a condition of any permit or water quality certification. In determining whether an activity has the potential to affect coral spawning, the EQC shall consider all of the following: 1) the magnitude of the sediment plume generated by the proposed activity; 2) the most likely extent and direction(s) of drift of the sediment plume; 3) the type of sediment and its composition; and 4) the proximity of broadcast spawning coral species to the proposed activity and expected sediment plume;

(4) A specified distance up-current and down-current from the permitted activity at which applicable water quality criteria must be met (i.e, an effect zone). Effect zones for dredge and fill activities shall be kept as small as practicable, and shall not exceed 300 feet down-current and 150 feet up-current. Down-current distance may be increased to 600 feet where typical currents can be shown to make the use of BMPs ineffective; and

(5) Any additional protective measures, limitations, monitoring, or effect zone requirements that the EQC identifies as being necessary to protect resources of concern; and

(6) Prior to commencing any dredging activity, authorization from AS-EPA must be received.

The EQC may require an applicant for water quality certification or permit for dredging, the discharge of dredged or fill material, or similar in-water, construction-related activities, to provide information necessary to support the development of monitoring plans, mitigation measures, or effect zone requirements, such as engineering designs, surveys of existing currents, water quality data, and baseline ecosystem and indicator species surveys.

§24.0209 Water Quality Certifications

(a) Water Quality Certification Issuance

Water quality certifications may be issued by the EQC for any proposed activity that is found not to violate applicable water quality standards and Sections 301, 302, 303, 306, and 307 of the ~~Federal~~ Clean Water Act, as amended. A water quality certification is required by Section 401 of the Clean Water Act of any applicant for a federal license or permit to conduct any activity, including, but not limited to, the construction or operation of facilities which may result in a discharge into navigable waters of the United States.

(b) Procedures to Apply for Water Quality Certification - Contents of ~~a~~Application

An applicant for certification shall submit a complete description of the discharge involved in the activity for which certification is sought, with a request for certification signed by the applicant. Such description shall include the following:

- (1) The name and address of the applicant;
- (2) A description of the facility or activity, and of any discharge into territorial waters which may result from the conduct of any activity including, but not limited to, the construction or operation of the facility, including characteristics of the discharge, ~~and the~~ location or locations at which such discharge may enter territorial waters;
- (3) If applicable, a description of the function and operation of equipment or facilities to control discharges, including specification of the methods of control to be used;
- (4) The estimated date or dates on which the activity will begin and end, and the date or dates on which the discharge(s) will take place;
- (5) If applicable, a description of the methods and means being used or proposed to monitor the quality and characteristics of the discharge and the operation of equipment or facilities employed in the control of the proposed discharges; and
- (6) The EQC may require the submission of additional information after a certification application has been filed. If a certification application is incomplete or otherwise deficient, processing of the application shall not be completed until such time as the applicant has supplied the missing information or otherwise corrected the deficiency. The EQC shall notify the applicant, in writing, within sixty days of the submission of an application if an application is incomplete or otherwise deficient. A description of the type of additional information necessary to complete the application or correct the deficiency shall be included with such a written notice. Failure to provide additional information or to correct a deficiency shall be sufficient grounds for denial of certification. EQC must act on the application after receipt of a completed application;

(c) Water Quality Certification - Notice and Hearing

The EQC will provide the public with the opportunity to comment on the water quality certification and may, upon request or its own initiative, provide the opportunity for public hearing(s) to consider the issuance of water quality certification as specified in the Administrative Procedures Act (~~ASCA~~, Title 04, Chapter 10, ~~ASCA~~) and Environmental Quality Act (~~ASCA~~, Title 24, ~~Chapter 1-ASCA~~). The EQC shall inform the applicant, in writing, that such action has been taken. If, after considering the complete application, comments received during the public comment period, the record, and other information the EQC deems relevant, the EQC determines that applicable water quality standards will not be violated and the best practicable methods of control will be applied to a discharge which is the result of any activity, including but not limited to the construction and operation of facilities, then the EQC shall so certify.

(d) Contents of Water Quality Certification

- (1) The name and address of the applicant;
- (2) A statement that the EQC has examined the application made by the applicant and other information furnished to the licensing or permitting agency and bases its certification upon an evaluation of all such information contained in such application which is relevant to water quality certification;
- (3) A statement that there is reasonable assurance that the activity will be conducted in a manner that will not violate water quality standards or the Clean Water Act;
- (4) A statement of any condition which the EQC deems necessary or desirable with respect to the discharge or the activity that will affect water quality; and
- (5) Such other information as the EQC may determine to be appropriate.

(e) Modification

The EQC may modify the certification prior to the issuance of the federal license or permit, after consideration of any additional information presented by the applicant, licensing or permitting agency or other government agencies or interested parties. The EQC shall provide the opportunity for public review and comment on any such modification.

(f) Water Quality Certification - Adoption of New or Revised Water Quality Standards

- (1) All water quality certifications issued by the EQC will include a clause indicating that the certification is subject to amendment or modification if new or revised water quality standards are adopted by the EQC.
- (2) Upon adoption or revision of water quality standards, the EQC will notify the licensing or permitting authority and request the licensing or permitting authority to amend or modify the license or permit to reflect the applicable water quality standards.

§24.0210 Enforcement, Compliance and Water Quality Monitoring

(a) Enforcement Authority

Enforcement of these standards shall be in accordance with the applicable provisions of the Environmental Quality Act, ASCA, Title 24, Chapter 01, ~~ASCA~~.

(b) Determination of Compliance with ~~Ambient~~ Standards

(1) Compliance with numeric water quality standards (§24.0206) shall be determined in accordance with the most recent version of “AS-EPA Implementation Guidance Manual for ASWQS Numeric Criteria”.

(2) In situations where the naturally occurring conditions result in exceedance of a standard, the ambient condition ~~natural conditions exceed a standard given in §24.0206, the natural water quality~~ shall constitute the applicable standard. ~~Natural conditions means free of substances or conditions which are attributable to the activities of man. Natural conditions exclude areas affected by activities such as piggeries, septic drain fields, and dredging or filling.~~

(c) Analytical Methods

Unless otherwise approved by the EQC and US ~~EPA~~ or stipulated in these standards, analysis performed to determine compliance with these standards shall be those approved by US EPA.

d) Sanitary Survey Requirements

If a monitoring station consistently exceeds the geometric mean standard for E. coli or enterococcus, the EQC shall conduct, or require a discharger to conduct, a survey to determine the source of the contamination. When a sanitary survey identifies a controllable source of indicator organisms associated with a discharge of sewage, the EQC shall take action to control the source. Waste discharge requirements shall require the discharger to conduct sanitary surveys when so directed by the EQC. Such requirements shall contain provisions requiring the discharger to control any controllable discharges identified in a sanitary survey.

e) Compliance Schedules for National Pollution Discharge Elimination System (NPDES) Permits

The use of compliance schedules for water quality-based effluent limitations (WQBELs) in National Pollutant Discharge Elimination System (NPDES) permits issued by the permitting authority is authorized by the EQC in accordance with the requirements under 40 CFR 122.47.-

Appendix A

Ammonia Toxicity Standards for Fresh and Marine Waters

|

Water Quality Criteria for Ammonia in Freshwater (ACUTE)^{1,2}
 One-Hour Average Concentration

Total Ammonia (mg/liter NH ₃)			
pH	20°C	25°C	30°C
6.50	29	29	20
6.75	27	26	18.6
7.00	23	23	16.4
7.25	19.2	19.0	13.5
7.50	14.6	14.5	10.3
7.75	10.3	10.2	7.3
8.00	6.8	6.8	4.9
8.25	3.9	4.0	2.9
8.50	2.3	2.4	1.84
8.75	1.42	1.52	1.18
9.00	0.94	1.04	0.82

Table N.4. Temperature and pH-Dependent Values of the CMC (Acute Criterion Magnitude) – Unionid Mussels Absent and *Oncorhynchus* Absent.

pH	Temperature (°C)																
	0-14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6.5	51	51	51	51	51	51	51	51	51	48	44	40	37	34	31	29	27
6.6	49	49	49	49	49	49	49	49	49	46	42	39	36	33	30	28	26
6.7	46	46	46	46	46	46	46	46	46	43	40	37	34	31	29	26	24
6.8	44	44	44	44	44	44	44	44	44	41	38	35	32	29	27	25	23
6.9	41	41	41	41	41	41	41	41	41	38	35	32	30	27	25	23	21
7.0	38	38	38	38	38	38	38	38	38	35	32	30	27	25	23	21	20
7.1	34	34	34	34	34	34	34	34	34	32	29	27	25	23	21	19	18
7.2	31	31	31	31	31	31	31	31	31	29	26	24	22	21	19	17	16
7.3	27	27	27	27	27	27	27	27	27	26	23	22	20	18	17	16	14
7.4	24	24	24	24	24	24	24	24	24	22	21	19	17	16	15	14	13
7.5	21	21	21	21	21	21	21	21	21	19	18	16	15	14	13	12	11
7.6	18	18	18	18	18	18	18	18	18	17	15	14	13	12	11	10	9.3
7.7	15	15	15	15	15	15	15	15	15	14	13	12	11	10	9.3	8.6	7.9
7.8	13	13	13	13	13	13	13	13	13	12	11	10	9.2	8.5	7.8	7.2	6.6
7.9	11	11	11	11	11	11	11	11	11	9.9	9.1	8.4	7.7	7.1	6.5	6.0	5.5
8.0	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.2	7.5	6.9	6.4	5.9	5.4	5.0	4.6
8.1	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.8	6.2	5.7	5.3	4.9	4.5	4.1	3.8
8.2	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.6	5.1	4.7	4.4	4.0	3.7	3.4	3.1
8.3	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.6	4.2	3.9	3.6	3.3	3.0	2.8	2.6
8.4	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	3.8	3.4	3.2	3.0	2.7	2.5	2.3	2.1
8.5	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.1	2.9	2.6	2.4	2.2	2.1	1.9	1.8
8.6	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.6	2.4	2.2	2.0	1.9	1.7	1.6	1.4
8.7	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.0	1.8	1.7	1.5	1.4	1.3	1.2
8.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.0
8.9	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.92	0.85
9.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.2	1.1	1.0	0.93	0.85	0.78	0.72

Water Quality Criteria for Ammonia in Freshwater (ACUTE)^{1,2}

<u>pH</u>	<u>Temperature (C°)</u>																
	<u>0-14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>	<u>24</u>	<u>25</u>	<u>26</u>	<u>27</u>	<u>28</u>	<u>29</u>	<u>30</u>
<u>6.5</u>	<u>51</u>	<u>51</u>	<u>51</u>	<u>51</u>	<u>51</u>	<u>51</u>	<u>51</u>	<u>51</u>	<u>51</u>	<u>48</u>	<u>44</u>	<u>40</u>	<u>37</u>	<u>34</u>	<u>31</u>	<u>29</u>	<u>27</u>
<u>6.6</u>	<u>49</u>	<u>49</u>	<u>49</u>	<u>49</u>	<u>49</u>	<u>49</u>	<u>49</u>	<u>49</u>	<u>49</u>	<u>46</u>	<u>42</u>	<u>39</u>	<u>36</u>	<u>33</u>	<u>30</u>	<u>28</u>	<u>26</u>
<u>6.7</u>	<u>46</u>	<u>46</u>	<u>46</u>	<u>46</u>	<u>46</u>	<u>46</u>	<u>46</u>	<u>46</u>	<u>46</u>	<u>43</u>	<u>40</u>	<u>37</u>	<u>34</u>	<u>31</u>	<u>29</u>	<u>26</u>	<u>24</u>
<u>6.8</u>	<u>44</u>	<u>44</u>	<u>44</u>	<u>44</u>	<u>44</u>	<u>44</u>	<u>44</u>	<u>44</u>	<u>44</u>	<u>41</u>	<u>38</u>	<u>35</u>	<u>32</u>	<u>29</u>	<u>27</u>	<u>25</u>	<u>23</u>
<u>6.9</u>	<u>41</u>	<u>41</u>	<u>41</u>	<u>41</u>	<u>41</u>	<u>41</u>	<u>41</u>	<u>41</u>	<u>41</u>	<u>38</u>	<u>35</u>	<u>32</u>	<u>30</u>	<u>27</u>	<u>25</u>	<u>23</u>	<u>21</u>
<u>7.0</u>	<u>38</u>	<u>38</u>	<u>38</u>	<u>38</u>	<u>38</u>	<u>38</u>	<u>38</u>	<u>38</u>	<u>38</u>	<u>35</u>	<u>32</u>	<u>30</u>	<u>27</u>	<u>25</u>	<u>23</u>	<u>21</u>	<u>20</u>
<u>7.1</u>	<u>34</u>	<u>34</u>	<u>34</u>	<u>34</u>	<u>34</u>	<u>34</u>	<u>34</u>	<u>34</u>	<u>34</u>	<u>32</u>	<u>29</u>	<u>27</u>	<u>25</u>	<u>23</u>	<u>21</u>	<u>19</u>	<u>18</u>
<u>7.2</u>	<u>31</u>	<u>31</u>	<u>31</u>	<u>31</u>	<u>31</u>	<u>31</u>	<u>31</u>	<u>31</u>	<u>31</u>	<u>29</u>	<u>26</u>	<u>24</u>	<u>22</u>	<u>21</u>	<u>19</u>	<u>17</u>	<u>16</u>
<u>7.3</u>	<u>27</u>	<u>27</u>	<u>27</u>	<u>27</u>	<u>27</u>	<u>27</u>	<u>27</u>	<u>27</u>	<u>27</u>	<u>26</u>	<u>23</u>	<u>22</u>	<u>20</u>	<u>18</u>	<u>17</u>	<u>16</u>	<u>14</u>
<u>7.4</u>	<u>24</u>	<u>24</u>	<u>24</u>	<u>24</u>	<u>24</u>	<u>24</u>	<u>24</u>	<u>24</u>	<u>24</u>	<u>22</u>	<u>21</u>	<u>19</u>	<u>17</u>	<u>16</u>	<u>15</u>	<u>14</u>	<u>13</u>
<u>7.5</u>	<u>21</u>	<u>21</u>	<u>21</u>	<u>21</u>	<u>21</u>	<u>21</u>	<u>21</u>	<u>21</u>	<u>21</u>	<u>19</u>	<u>18</u>	<u>16</u>	<u>15</u>	<u>14</u>	<u>13</u>	<u>12</u>	<u>11</u>
<u>7.6</u>	<u>18</u>	<u>18</u>	<u>18</u>	<u>18</u>	<u>18</u>	<u>18</u>	<u>18</u>	<u>18</u>	<u>18</u>	<u>17</u>	<u>15</u>	<u>14</u>	<u>13</u>	<u>12</u>	<u>11</u>	<u>10</u>	<u>9.3</u>
<u>7.7</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>14</u>	<u>13</u>	<u>12</u>	<u>11</u>	<u>10</u>	<u>9.3</u>	<u>8.6</u>	<u>7.9</u>
<u>7.8</u>	<u>13</u>	<u>13</u>	<u>13</u>	<u>13</u>	<u>13</u>	<u>13</u>	<u>13</u>	<u>13</u>	<u>13</u>	<u>12</u>	<u>11</u>	<u>10</u>	<u>9.2</u>	<u>8.5</u>	<u>7.8</u>	<u>7.2</u>	<u>6.6</u>
<u>7.9</u>	<u>11</u>	<u>11</u>	<u>11</u>	<u>11</u>	<u>11</u>	<u>11</u>	<u>11</u>	<u>11</u>	<u>11</u>	<u>9.9</u>	<u>9.1</u>	<u>8.4</u>	<u>7.7</u>	<u>7.1</u>	<u>6.5</u>	<u>6.0</u>	<u>5.5</u>
<u>8.0</u>	<u>8.8</u>	<u>8.8</u>	<u>8.8</u>	<u>8.8</u>	<u>8.8</u>	<u>8.8</u>	<u>8.8</u>	<u>8.8</u>	<u>8.8</u>	<u>8.2</u>	<u>7.5</u>	<u>6.9</u>	<u>6.4</u>	<u>5.9</u>	<u>5.4</u>	<u>5.0</u>	<u>4.6</u>
<u>8.1</u>	<u>7.3</u>	<u>7.3</u>	<u>7.3</u>	<u>7.3</u>	<u>7.3</u>	<u>7.3</u>	<u>7.3</u>	<u>7.3</u>	<u>7.3</u>	<u>6.8</u>	<u>6.2</u>	<u>5.7</u>	<u>5.3</u>	<u>4.9</u>	<u>4.5</u>	<u>4.1</u>	<u>3.8</u>
<u>8.2</u>	<u>6.0</u>	<u>6.0</u>	<u>6.0</u>	<u>6.0</u>	<u>6.0</u>	<u>6.0</u>	<u>6.0</u>	<u>6.0</u>	<u>6.0</u>	<u>5.6</u>	<u>5.1</u>	<u>4.7</u>	<u>4.4</u>	<u>4.0</u>	<u>3.7</u>	<u>3.4</u>	<u>3.1</u>

8.3	<u>4.9</u>	<u>4.9</u>	<u>4.9</u>	<u>4.9</u>	<u>4.9</u>	<u>4.9</u>	<u>4.9</u>	<u>4.9</u>	<u>4.9</u>	<u>4.9</u>	<u>4.6</u>	<u>4.2</u>	<u>3.9</u>	<u>3.6</u>	<u>3.3</u>	<u>3.0</u>	<u>2.8</u>	<u>2.6</u>
8.4	<u>4.1</u>	<u>4.1</u>	<u>4.1</u>	<u>4.1</u>	<u>4.1</u>	<u>4.1</u>	<u>4.1</u>	<u>4.1</u>	<u>4.1</u>	<u>4.1</u>	<u>3.8</u>	<u>3.4</u>	<u>3.2</u>	<u>3.0</u>	<u>2.7</u>	<u>2.5</u>	<u>2.3</u>	<u>2.1</u>
8.5	<u>3.3</u>	<u>3.3</u>	<u>3.3</u>	<u>3.3</u>	<u>3.3</u>	<u>3.3</u>	<u>3.3</u>	<u>3.3</u>	<u>3.3</u>	<u>3.3</u>	<u>3.1</u>	<u>2.9</u>	<u>2.6</u>	<u>2.4</u>	<u>2.2</u>	<u>2.1</u>	<u>1.9</u>	<u>1.8</u>
8.6	<u>2.8</u>	<u>2.8</u>	<u>2.8</u>	<u>2.8</u>	<u>2.8</u>	<u>2.8</u>	<u>2.8</u>	<u>2.8</u>	<u>2.8</u>	<u>2.8</u>	<u>2.6</u>	<u>2.4</u>	<u>2.2</u>	<u>2.0</u>	<u>1.9</u>	<u>1.7</u>	<u>1.6</u>	<u>1.4</u>
8.7	<u>2.3</u>	<u>2.3</u>	<u>2.3</u>	<u>2.3</u>	<u>2.3</u>	<u>2.3</u>	<u>2.3</u>	<u>2.3</u>	<u>2.3</u>	<u>2.3</u>	<u>2.2</u>	<u>2.0</u>	<u>1.8</u>	<u>1.7</u>	<u>1.5</u>	<u>1.4</u>	<u>1.3</u>	<u>1.2</u>
8.8	<u>1.9</u>	<u>1.9</u>	<u>1.9</u>	<u>1.9</u>	<u>1.9</u>	<u>1.9</u>	<u>1.9</u>	<u>1.9</u>	<u>1.9</u>	<u>1.9</u>	<u>1.8</u>	<u>1.7</u>	<u>1.5</u>	<u>1.4</u>	<u>1.3</u>	<u>1.2</u>	<u>1.1</u>	<u>1.0</u>
8.9	<u>1.6</u>	<u>1.6</u>	<u>1.6</u>	<u>1.6</u>	<u>1.6</u>	<u>1.6</u>	<u>1.6</u>	<u>1.6</u>	<u>1.6</u>	<u>1.6</u>	<u>1.5</u>	<u>1.4</u>	<u>1.3</u>	<u>1.2</u>	<u>1.1</u>	<u>1.0</u>	<u>0.92</u>	<u>0.85</u>
9.0	<u>1.4</u>	<u>1.4</u>	<u>1.4</u>	<u>1.4</u>	<u>1.4</u>	<u>1.4</u>	<u>1.4</u>	<u>1.4</u>	<u>1.4</u>	<u>1.4</u>	<u>1.3</u>	<u>1.2</u>	<u>1.1</u>	<u>1.0</u>	<u>0.93</u>	<u>0.85</u>	<u>0.78</u>	<u>0.72</u>

1 Source: Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater 2013. EPA-822-R-13-001

2 Units: Total Ammonia Nitrogen (TAN). To convert these units see source document

~~*To convert these values to mg/liter N, multiply by 0.822.~~

~~†Ambient Water Quality for Ammonia-1984, EPA 440/5-85-001, January~~

Water Quality Criteria for Ammonia in Freshwater (CHRONIC)^{1,2}

pH	Temperature (C°)																
	0-14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6.5	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.0	6.6	6.2	5.8	5.4	5.1	4.8	4.5	4.2
6.6	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	6.9	6.5	6.1	5.7	5.4	5.0	4.7	4.4	4.1
6.7	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	6.8	6.4	6.0	5.6	5.3	4.9	4.6	4.3	4.1
6.8	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.6	6.2	5.8	5.5	5.1	4.8	4.5	4.2	4.0
6.9	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.5	6.1	5.7	5.3	5.0	4.7	4.4	4.1	3.9
7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.2	5.8	5.5	5.1	4.8	4.5	4.2	4.0	3.7
7.1	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.0	5.6	5.3	4.9	4.6	4.3	4.1	3.8	3.6
7.2	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.7	5.3	5.0	4.7	4.4	4.1	3.9	3.6	3.4
7.3	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.4	5.0	4.7	4.4	4.1	3.9	3.6	3.4	3.2
7.4	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.0	4.7	4.4	4.1	3.9	3.6	3.4	3.2	3.0
7.5	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.6	4.3	4.1	3.8	30.6	3.3	3.1	2.9	2.8
7.6	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.2	3.9	3.7	3.5	3.2	3.0	2.9	2.7	2.5
7.7	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.8	3.5	3.3	3.1	2.9	2.7	2.6	2.4	2.3
7.8	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.4	3.2	3.0	2.8	2.6	2.4	2.3	2.1	2.0
7.9	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.0	2.8	2.6	2.4	2.3	2.1	2.0	1.9	1.8
8.0	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.4	2.3	2.1	2.0	1.9	1.7	1.6	1.5
8.1	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.1	1.9	1.8	1.7	1.6	1.5	1.4	1.3
8.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1
8.3	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1.0	0.96
8.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.2	1.1	1.1	0.99	0.93	0.87	0.81
8.5	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.0	0.95	0.89	0.83	0.78	0.73	0.69

<u>8.6</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>0.97</u>	<u>0.91</u>	<u>0.85</u>	<u>0.80</u>	<u>0.75</u>	<u>0.70</u>	<u>0.66</u>	<u>0.62</u>	<u>0.58</u>
<u>8.7</u>	<u>0.86</u>	<u>0.86</u>	<u>0.86</u>	<u>0.86</u>	<u>0.86</u>	<u>0.86</u>	<u>0.86</u>	<u>0.86</u>	<u>0.82</u>	<u>0.77</u>	<u>0.72</u>	<u>0.68</u>	<u>0.64</u>	<u>0.60</u>	<u>0.56</u>	<u>0.52</u>	<u>0.49</u>
<u>8.8</u>	<u>0.73</u>	<u>0.73</u>	<u>0.73</u>	<u>0.73</u>	<u>0.73</u>	<u>0.73</u>	<u>0.73</u>	<u>0.73</u>	<u>0.70</u>	<u>0.65</u>	<u>0.61</u>	<u>0.58</u>	<u>0.54</u>	<u>0.51</u>	<u>0.47</u>	<u>0.44</u>	<u>0.42</u>
<u>8.9</u>	<u>0.62</u>	<u>0.62</u>	<u>0.62</u>	<u>0.62</u>	<u>0.62</u>	<u>0.62</u>	<u>0.62</u>	<u>0.62</u>	<u>0.60</u>	<u>0.56</u>	<u>0.52</u>	<u>0.49</u>	<u>0.46</u>	<u>0.43</u>	<u>0.41</u>	<u>0.38</u>	<u>0.36</u>
<u>9.0</u>	<u>0.54</u>	<u>0.54</u>	<u>0.54</u>	<u>0.54</u>	<u>0.54</u>	<u>0.54</u>	<u>0.54</u>	<u>0.54</u>	<u>0.51</u>	<u>0.48</u>	<u>0.45</u>	<u>0.42</u>	<u>0.40</u>	<u>0.37</u>	<u>0.35</u>	<u>0.33</u>	<u>0.31</u>

Water Quality Criteria for Ammonia in Freshwater (CHRONIC)^{1,2}

Table N.8. Temperature and pH-Dependent Values of the CCC (Chronic Criterion Magnitude) – Mussels Absent and Early Life Stage (ELS) Protection Necessary.
 Temperature (°C)

pH	0-14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6.5	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.0	6.6	6.2	5.8	5.4	5.1	4.8	4.5	4.2
6.6	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	6.9	6.5	6.1	5.7	5.4	5.0	4.7	4.4	4.1
6.7	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	6.8	6.4	6.0	5.6	5.3	4.9	4.6	4.3	4.1
6.8	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.6	6.2	5.8	5.5	5.1	4.8	4.5	4.2	4.0
6.9	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.5	6.1	5.7	5.3	5.0	4.7	4.4	4.1	3.9
7.0	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.2	5.8	5.5	5.1	4.8	4.5	4.2	4.0	3.7
7.1	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.0	5.6	5.3	4.9	4.6	4.3	4.1	3.8	3.6
7.2	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.7	5.3	5.0	4.7	4.4	4.1	3.9	3.6	3.4
7.3	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.4	5.0	4.7	4.4	4.1	3.9	3.6	3.4	3.2
7.4	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.0	4.7	4.4	4.1	3.9	3.6	3.4	3.2	3.0
7.5	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.6	4.3	4.1	3.8	3.6	3.3	3.1	2.9	2.8
7.6	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.2	3.9	3.7	3.5	3.2	3.0	2.9	2.7	2.5
7.7	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.8	3.5	3.3	3.1	2.9	2.7	2.6	2.4	2.3
7.8	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.4	3.2	3.0	2.8	2.6	2.4	2.3	2.1	2.0
7.9	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.0	2.8	2.6	2.4	2.3	2.1	2.0	1.9	1.8
8.0	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.4	2.3	2.1	2.0	1.9	1.7	1.6	1.5
8.1	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.1	1.9	1.8	1.7	1.6	1.5	1.4	1.3
8.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1
8.3	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1.0	0.96
8.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.2	1.1	1.1	0.99	0.93	0.87	0.81
8.5	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.0	0.95	0.89	0.83	0.78	0.73	0.69
8.6	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.97	0.91	0.85	0.80	0.75	0.70	0.66	0.62	0.58
8.7	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.82	0.77	0.72	0.68	0.64	0.60	0.56	0.52	0.49
8.8	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.70	0.65	0.61	0.58	0.54	0.51	0.47	0.44	0.42
8.9	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.60	0.56	0.52	0.49	0.46	0.43	0.41	0.38	0.36
9.0	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.51	0.48	0.45	0.42	0.40	0.37	0.35	0.33	0.31

Four-Day Average Concentration

Total Ammonia (mg/liter NH ₃)			
pH	20°C	25°C	30°C

6.50	2.5	1.73	1.23
6.75	2.5	1.74	1.23
7.00	2.5	1.74	1.23
7.25	2.5	1.75	1.24
7.50	2.5	1.76	1.25
7.75	2.3	1.65	1.18
8.00	1.55	1.10	0.79
8.25	0.90	0.64	0.47
8.50	0.53	0.39	0.29
8.75	0.32	0.24	0.190
9.00	0.21	0.163	0.133

¹ Source: Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater 2013. EPA-822-R-13-001

² Units: Total Ammonia Nitrogen (TAN). To convert these units see source document

Water Quality Criteria for Saltwater Aquatic Life Based on Total Ammonia mg/L

Criteria Maximum Concentrations

pH	Temperature (°C)							
	0	5	10	15	20	25	30	35
	Salinity = 10 g/kg							
7.0	270	191	131	92	62	44	29	21
7.2	175	121	83	58	40	27	19	13
7.4	110	77	52	35	25	17	12	8.3
7.6	69	48	33	23	16	11	7.7	5.6
7.8	44	31	21	15	10	7.1	5.0	3.5
8.0	27	19	13	9.4	6.4	4.6	3.1	2.3
8.2	18	12	8.5	5.8	4.2	2.9	2.1	1.5
8.4	11	7.9	5.4	3.7	2.7	1.9	1.4	1.0
8.6	7.3	5.0	3.5	2.5	1.8	1.3	0.98	0.75
8.8	4.6	3.3	2.3	1.7	1.2	0.92	0.71	0.56
9.0	2.9	2.1	1.5	1.1	0.85	0.67	0.52	0.44

* To convert these values to mg/liter N, multiply by 0.822.

¹ Ambient Water Quality for Ammonia-1984, EPA 440/5-85-001, January 1985 as amended by memorandum "Revised Tables for Determining Average Freshwater Ammonia Concentrations," July 30, 1992.

Water Quality Criteria for Saltwater Aquatic Life Based on Total Ammonia mg/L

Criteria Maximum Concentrations

pH	Temperature (°C)							
	0	5	10	15	20	25	30	35
	Salinity = 10 g/kg							
7.0	270	191	131	92	62	44	29	21
7.2	175	121	83	58	40	27	19	13
7.4	110	77	52	35	25	17	12	8.3
7.6	69	48	33	23	16	11	7.7	5.6
7.8	44	31	21	15	10	7.1	5.0	3.5
8	27	19	13	9.4	6.4	4.6	3.1	2.3
8.2	18	12	8.5	5.8	4.2	2.9	2.1	1.5
8.4	11	7.9	5.4	3.7	2.7	1.9	1.4	1.0
8.6	7.3	5.0	3.5	2.5	1.8	1.3	0.98	0.75
8.8	4.6	3.3	2.3	1.7	1.2	0.92	0.71	0.56
9	2.9	2.1	1.5	1.1	0.85	0.67	0.52	0.44

Water Quality Criteria for Ammonia in Saltwater (ACUTE)¹

One-Hour Average Concentration

Total Ammonia (mg/liter NH ₃)								
Salinity = 30 g/kg								
pH	25°C			30°C			35°C	
7.8	7.9			5.4			3.7	
8.0	5.0			3.5			2.5	
8.2	3.3			2.3			1.7	
8.4	2.1			1.6			1.1	
8.6	1.4			1.1			0.81	

pH	Salinity = 20 g/kg							
7.0	291	200	137	96	64	44	31	21
7.2	183	125	87	60	42	29	20	14
7.4	116	79	54	37	27	18	12	8.7
7.6	73	50	35	23	17	11	7.9	5.6
7.8	46	31	23	15	11	7.5	5.2	3.5
8.0	29	20	14	9.8	6.7	4.8	3.3	2.3
8.2	19	13	8.9	6.2	4.4	3.1	2.1	1.6
8.4	12	8.1	5.6	4.0	2.9	2.0	1.5	1.1
8.6	7.5	5.2	3.7	2.7	1.9	1.4	1.0	0.77
8.8	4.8	3.3	2.5	1.7	1.3	0.94	0.73	0.56
9.0	3.1	2.3	1.6	1.2	0.87	0.69	0.54	0.44

* To convert these values to mg/liter N, multiply by 0.822.

pH	Salinity = 30 g/kg							
7.0	312	208	148	102	71	48	33	23
7.2	196	135	94	64	44	31	21	15
7.4	125	85	58	40	27	19	13	9.4
7.6	79	54	37	25	21	12	8.5	6.0
7.8	50	33	23	16	11	7.9	5.4	3.7
8.0	31	21	15	10	7.3	5.0	3.5	2.5

<u>8.2</u>	<u>20</u>	<u>14</u>	<u>9.6</u>	<u>6.7</u>	<u>4.6</u>	<u>3.3</u>	<u>2.3</u>	<u>1.7</u>
<u>8.4</u>	<u>12.7</u>	<u>8.7</u>	<u>6.0</u>	<u>4.2</u>	<u>2.9</u>	<u>2.1</u>	<u>1.6</u>	<u>1.1</u>
<u>8.6</u>	<u>8.1</u>	<u>5.6</u>	<u>4.0</u>	<u>2.7</u>	<u>2.0</u>	<u>1.4</u>	<u>1.1</u>	<u>0.81</u>
<u>8.8</u>	<u>5.2</u>	<u>3.5</u>	<u>2.5</u>	<u>1.8</u>	<u>1.3</u>	<u>1.0</u>	<u>0.75</u>	<u>0.58</u>
<u>9.0</u>	<u>3.3</u>	<u>2.3</u>	<u>1.7</u>	<u>1.2</u>	<u>0.94</u>	<u>0.71</u>	<u>0.56</u>	<u>0.46</u>

¹-Ambient Water Quality Criteria for Ammonia (Saltwater)-1989, EPA 440/5-88-004, April 1989

Water Quality Criteria for Ammonia in Saltwater (CHRONIC)¹ Four-Day Average Concentration

Total Ammonia (mg/liter NH₃)			
Salinity = 30 g/kg			
pH	25°C	30°C	35°C
<u>7.8</u>	<u>1.2</u>	<u>0.81</u>	<u>0.56</u>
<u>8.0</u>	<u>0.75</u>	<u>0.53</u>	<u>0.37</u>
<u>8.2</u>	<u>0.50</u>	<u>0.34</u>	<u>0.25</u>
<u>8.4</u>	<u>0.31</u>	<u>0.23</u>	<u>0.17</u>
<u>8.6</u>	<u>0.22</u>	<u>0.16</u>	<u>0.12</u>

¹* To convert these values to mg/liter N, multiply by 0.822.

¹-Ambient Water Quality Criteria for Ammonia (Saltwater)-1989, EPA 440/5-88-004, April 1989

¹ Ambient Water Quality Criteria for Ammonia (Saltwater)-1989, EPA 440/5-88-004, April 1989

Water Quality Criteria for Saltwater Aquatic Life Based on Total Ammonia mg/L Criteria Continuous Concentrations

<u>-</u>	<u>Temperature (°C)</u>							
	<u>0</u>	<u>5</u>	<u>10</u>	<u>15</u>	<u>20</u>	<u>25</u>	<u>30</u>	<u>35</u>
<u>pH</u>	<u>Salinity = 10 g/kg</u>							
<u>7.0</u>	<u>41</u>	<u>29</u>	<u>20</u>	<u>14</u>	<u>9.4</u>	<u>6.6</u>	<u>4.4</u>	<u>3.1</u>

<u>7.2</u>	<u>26</u>	<u>18</u>	<u>12</u>	<u>8.7</u>	<u>5.9</u>	<u>4.1</u>	<u>2.8</u>	<u>2.0</u>
<u>7.4</u>	<u>17</u>	<u>12</u>	<u>7.8</u>	<u>5.3</u>	<u>3.7</u>	<u>2.6</u>	<u>1.8</u>	<u>1.2</u>
<u>7.6</u>	<u>10</u>	<u>7.2</u>	<u>5.0</u>	<u>3.4</u>	<u>2.4</u>	<u>1.7</u>	<u>1.2</u>	<u>0.84</u>
<u>7.8</u>	<u>6.6</u>	<u>4.7</u>	<u>3.1</u>	<u>2.2</u>	<u>1.5</u>	<u>1.1</u>	<u>0.75</u>	<u>0.53</u>
<u>8.0</u>	<u>4.1</u>	<u>2.9</u>	<u>2.0</u>	<u>1.40</u>	<u>0.97</u>	<u>0.69</u>	<u>0.47</u>	<u>0.34</u>
<u>8.2</u>	<u>2.7</u>	<u>1.8</u>	<u>1.3</u>	<u>0.87</u>	<u>0.62</u>	<u>0.44</u>	<u>0.31</u>	<u>0.23</u>
<u>8.4</u>	<u>1.7</u>	<u>1.2</u>	<u>0.81</u>	<u>0.56</u>	<u>0.41</u>	<u>0.29</u>	<u>0.21</u>	<u>0.16</u>
<u>8.6</u>	<u>1.1</u>	<u>0.75</u>	<u>0.53</u>	<u>0.37</u>	<u>0.27</u>	<u>0.20</u>	<u>0.15</u>	<u>0.11</u>
<u>8.8</u>	<u>0.69</u>	<u>0.50</u>	<u>0.34</u>	<u>0.25</u>	<u>0.18</u>	<u>0.14</u>	<u>0.11</u>	<u>0.08</u>
<u>9.0</u>	<u>0.44</u>	<u>0.31</u>	<u>0.23</u>	<u>0.17</u>	<u>0.13</u>	<u>0.10</u>	<u>0.08</u>	<u>0.07</u>

<u>pH</u>	<u>Salinity = 20 g/kg</u>							
<u>7.0</u>	<u>44</u>	<u>30</u>	<u>21</u>	<u>14</u>	<u>9.7</u>	<u>6.6</u>	<u>4.7</u>	<u>3.1</u>
<u>7.2</u>	<u>27</u>	<u>19</u>	<u>13</u>	<u>9.0</u>	<u>6.2</u>	<u>4.4</u>	<u>3.0</u>	<u>2.1</u>
<u>7.4</u>	<u>18</u>	<u>12</u>	<u>8.1</u>	<u>5.6</u>	<u>4.1</u>	<u>2.7</u>	<u>1.9</u>	<u>1.3</u>
<u>7.6</u>	<u>11</u>	<u>7.5</u>	<u>5.3</u>	<u>3.4</u>	<u>2.5</u>	<u>1.7</u>	<u>1.2</u>	<u>0.84</u>
<u>7.8</u>	<u>6.9</u>	<u>4.7</u>	<u>3.4</u>	<u>2.3</u>	<u>1.6</u>	<u>1.1</u>	<u>0.78</u>	<u>0.53</u>
<u>8.0</u>	<u>4.4</u>	<u>3.0</u>	<u>2.1</u>	<u>1.5</u>	<u>1.0</u>	<u>0.72</u>	<u>0.50</u>	<u>0.34</u>
<u>8.2</u>	<u>2.8</u>	<u>1.9</u>	<u>1.3</u>	<u>0.94</u>	<u>0.66</u>	<u>0.47</u>	<u>0.31</u>	<u>0.24</u>
<u>8.4</u>	<u>1.8</u>	<u>1.2</u>	<u>0.84</u>	<u>0.59</u>	<u>0.44</u>	<u>0.30</u>	<u>0.22</u>	<u>0.16</u>
<u>8.6</u>	<u>1.1</u>	<u>0.78</u>	<u>0.56</u>	<u>0.41</u>	<u>0.28</u>	<u>0.20</u>	<u>0.15</u>	<u>0.12</u>
<u>8.8</u>	<u>0.72</u>	<u>0.50</u>	<u>0.37</u>	<u>0.26</u>	<u>0.19</u>	<u>0.14</u>	<u>0.11</u>	<u>0.08</u>
<u>9.0</u>	<u>0.47</u>	<u>0.34</u>	<u>0.24</u>	<u>0.18</u>	<u>0.13</u>	<u>0.10</u>	<u>0.08</u>	<u>0.07</u>

<u>pH</u>	<u>Salinity = 30 g/kg</u>							
<u>7.0</u>	<u>47</u>	<u>31</u>	<u>22</u>	<u>15</u>	<u>11</u>	<u>7.2</u>	<u>5.0</u>	<u>3.4</u>
<u>7.2</u>	<u>29</u>	<u>20</u>	<u>14</u>	<u>9.7</u>	<u>6.6</u>	<u>4.7</u>	<u>3.1</u>	<u>2.2</u>
<u>7.4</u>	<u>19</u>	<u>13</u>	<u>8.7</u>	<u>5.9</u>	<u>4.1</u>	<u>2.9</u>	<u>2.0</u>	<u>1.4</u>
<u>7.6</u>	<u>12</u>	<u>8.1</u>	<u>5.6</u>	<u>3.7</u>	<u>3.1</u>	<u>1.8</u>	<u>1.3</u>	<u>0.90</u>
<u>7.8</u>	<u>7.5</u>	<u>5.0</u>	<u>3.4</u>	<u>2.4</u>	<u>1.7</u>	<u>1.2</u>	<u>0.81</u>	<u>0.56</u>
<u>8.0</u>	<u>4.7</u>	<u>3.1</u>	<u>2.2</u>	<u>1.6</u>	<u>1.1</u>	<u>0.75</u>	<u>0.53</u>	<u>0.37</u>
<u>8.2</u>	<u>3.0</u>	<u>2.1</u>	<u>1.4</u>	<u>1.0</u>	<u>0.69</u>	<u>0.50</u>	<u>0.34</u>	<u>0.25</u>
<u>8.4</u>	<u>1.9</u>	<u>1.3</u>	<u>0.90</u>	<u>0.62</u>	<u>0.44</u>	<u>0.31</u>	<u>0.23</u>	<u>0.17</u>
<u>8.6</u>	<u>1.2</u>	<u>0.84</u>	<u>0.59</u>	<u>0.41</u>	<u>0.30</u>	<u>0.22</u>	<u>0.16</u>	<u>0.12</u>

<u>8.8</u>	<u>0.78</u>	<u>0.53</u>	<u>0.37</u>	<u>0.27</u>	<u>0.20</u>	<u>0.15</u>	<u>0.11</u>	<u>0.09</u>
<u>9.0</u>	<u>0.50</u>	<u>0.34</u>	<u>0.26</u>	<u>0.19</u>	<u>0.14</u>	<u>0.11</u>	<u>0.08</u>	<u>0.07</u>

¹ [Ambient Water Quality Criteria for Ammonia \(Saltwater\)-1989, EPA 440/5-88-004, April 1989](#)