Presented below are water quality standards that are in effect for Clean Water Act purposes.

EPA is posting these standards as a convenience to users and has made a reasonable effort to assure their accuracy. Additionally, EPA has made a reasonable effort to identify parts of the standards that are not approved, disapproved, or are otherwise not in effect for Clean Water Act purposes.

Pueblo of Santa Ana Water Quality Standards
Effective September 28, 2021

Except as noted below, the *Pueblo of Santa Ana Water Quality* Standards have been approved by EPA. Several provisions were adopted in the *Pueblo of Santa Ana Water Quality* Standards that EPA does not consider to be water quality standards under Clean Water Act. EPA did not take action on these provisions because they are not (1) legally binding provisions adopted or established pursuant to Tribal law that (2) address designated uses, criteria, or antidegradation, and (3) describe the desired condition or level of protection of the water body.

Section I. Introduction, Authority, and Applicability

EPA took no action on the provision at Part G. Water Rights, as the agency generally does not act on provisions addressing water quantity.

Section III. General Standards

EPA took no action on the sediment quality guidelines for ten parameters included under Part Q. Sediment Quality. These guidelines may be used in the Pueblo of Santa Ana's monitoring and assessment program, but are not intended as numeric criteria in regulatory programs.

Section V. Uses and Selected Standards for Designated Water Bodies

EPA took no action on the Beach Action Values adopted for each water body under Section V. In the Response to Comments on the proposed standards, the Pueblo of Santa Ana noted that it will use these values to communicate the risks associated with potential bacteriological contamination of the Pueblo's waters.

Section VI. Sampling and Analyses

EPA took no action on Part A. Sample Collection, Preservation, and Analysis and Part C. Sampling Procedures of Section VI, which include technical references and general guidelines for the Pueblo of Santa Ana's water quality monitoring program.

Section VII. Definitions

EPA took no action on the definition for "Water Resources of the Pueblo" in Section VII, as it applies to waters beyond the scope covered under the CWA.

Pueblo of Santa Ana
Water Quality Standards

November 26, 2013 Final Adoption

1st Revision December 2020

The Pueblo of Santa Ana
02 Dove Road
Santa Ana Pueblo, NM 87004

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List of Appendices

Section I. INTRODUCTION, AUTHORITY, AND APPLICABILITY

Pursuant to Section 518[1] of the Clean Water Act[2], the Tribal Council of the Pueblo of Santa Ana, a federally-recognized Indian Tribe, hereby adopts and enacts the Pueblo of Santa Ana Water Quality Standards.

A. Purpose:

The Tribal Council recognizes that the Pueblo's clean waters are an extraordinary resource and wishes to ensure their protection so that traditional and cultural uses of those waters may continue. The Tribal Council wishes to protect the health, safety, welfare, and environment of the Pueblo, its people, and residents. The Tribal Council therefore enacts these Standards in order to prevent, reduce, and eliminate pollution of **surface waters of the Pueblo of Santa Ana**[3] and to plan the development and use (including restoration and enhancement) of land and water resources within the Pueblo's jurisdiction by:

1. Designating the existing and attainable uses for which the **surface waters of the Pueblo** shall be protected.
2. Prescribing water quality standards to sustain these **designated uses** and to provide for the protection and propagation of fish and wildlife and recreation in and on the water.
3. Protecting other uses of **surface waters of the Pueblo,** such as irrigation, ceremonial, domestic water supply, and recharge of domestic water supply, provided that pollution that may result from such uses shall not lower the quality of the water below that required for recreation and protection and propagation of fish and wildlife.
4. Assuring that degradation of **surface waters of the Pueblo** shall be minimized and that economic growth shall occur in a manner consistent with the preservation of the Pueblo's existing clean water resources.

These purposes shall be accomplished by incorporating and applying the standards set forth in the Pueblo of Santa Ana Water Quality Standards into the permitting and management process for **point source** dischargers and **non-point source** generators, by using those standards to determine when a **designated use** is threatened, by using current treatment technologies to control **point source**s and **best management practices** for **non-point source**s of pollution, and by monitoring **point source** and **non-point source** sources of pollution.

B. Applicability

The Pueblo of Santa Ana Water Quality Standards apply to all **surface waters of the Pueblo of Santa Ana**, within the exterior boundaries of the Pueblo of Santa Ana Indian Reservation including water situated wholly or partly within, or bordering upon, the Reservation. The Pueblo of Santa Ana Water Quality Standards apply to substances attributable to discharges, **non-point source**s or in-stream activities. The Pueblo of Santa Ana Water Quality Standards shall not apply to acts of God or natural

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[1] 33 U.S.C. Section 1377 (enacted February 4, 1987).

[2] 33 U.S.C. Section 1251 et seq. (1948, as amended).

[3] Words and terms defined in the Definitions Section (VIII) are designated in bold wherever used in the text of the "Pueblo of Santa Ana Water Quality Standards."

phenomena not brought about by human activity.

C. Consistency with Federal Requirements

The Pueblo of Santa Ana Water Quality Standards are consistent with Section 101(a)(2) of the Clean Water Act (33 U.S.C. Section 1251 (a)(2)) which declares that "the objective of this chapter is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. In order to achieve this objective, it is hereby declared that it is the national goal that, wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983." The Pueblo of Santa Ana Water Quality Standards provide that any contamination that may result from any uses shall not lower the quality of the water below what is required for recreation and protection and propagation of fish, shellfish, and wildlife.

D. Wetlands

All **wetlands** within the reservation, with the exception of **wetlands** constructed for the repository or treatment of wastes from human sources, are considered **surface waters of the Pueblo**. All **wetlands** will be held to the standards necessary to support the biological and physical characteristics naturally present within the **wetlands**. **Wetlands** will be protected to prevent significant adverse impacts on:

- Water flow and circulation, erosion, or sedimentation patterns;
- Natural water temperature variations;
- The chemical, nutrient, and **dissolved oxygen** regime of the wetland;
- The normal movement of aquatic fauna;
- The pH of the **wetland**; and
- Normal water levels or elevations.

E. Antidegradation

The **Antidegradation** policy for **surface waters of the Pueblo of Santa Ana** and the procedures for implementing it are set forth in Section II.

F. Public Hearings

Pursuant to Section 303(c)(1) of the Clean Water Act (33 U.S.C. Section 1313(c)), the Pueblo of Santa Ana shall hold public hearings at least once every three years for the purpose of reviewing and, as appropriate, amending the Pueblo of Santa Ana Water Quality Standards. The Water Quality Standards shall be reviewed once every three years following enactment. Revisions shall incorporate new information and relevant scientific and engineering advances.

EPA took no action on the provision at Part G. Water Rights, as EPA generally does not act on provisions addressing water quantity. The underlined text is not effective for CWA purposes.

G. Water Rights

The right of the Pueblo to certain quantities of water and the authority of the Pueblo to allocate quantities of water within its jurisdiction shall not be superseded, abrogated, or otherwise impaired by these Standards. The Pueblo will cooperate with federal and state agencies to prevent, reduce, and eliminate water pollution in coordination with programs for managing water resources.

H. Applicability of Uses

Designated uses shall be protected at all times including periods of low flow. The **rivers**, **streams**, and **arroyos** of the Pueblo of Santa Ana are all **intermittent** or **ephemeral**, with the exception of the Rio Grande. When ephemeral and intermittent streams have a low flow value of zero, all flows shall meet standards for the designated uses. The critical low flow of the Rio Grande (a **perennial stream)** on the Pueblo shall be the minimum average four consecutive day flow which occurs with a frequency of once in

three years (4Q3) as measured at the Rio Grande below Cochiti Dam (USGS Gage Number 08317400). All discharges to the Rio Grande shall meet standards for the **designated uses** at the 4Q3 low flow. For standing bodies of water, standards particular to a use shall be maintained whenever the water body is suitable for the use. The General Standards (SECTION III, below) shall be maintained at all times and shall apply to all **surface waters of the Pueblo of Santa Ana**, whether **perennial**, **ephemeral**, or **intermittent** in nature. The standards assigned to a body of water shall be the most stringent standards required to protect all uses designated for that body of water. Reservoirs used for water treatment are exempt from these standards, provided, however, that the water released from any such reservoir meets the standards that apply to the receiving body of water.

I. Human Health Implementation

For use in implementation of human health criteria, the harmonic mean flow will be used. The harmonic mean flow is the number of daily flow measurements divided by the sum of the reciprocals of the flows (i.e., the reciprocal of the mean of reciprocals). In **ephemeral** waters, the calculation shall be based upon the nonzero flow intervals and modified by including a factor to adjust for the proportion of intervals with zero flow. The equations are as follows:

$$\text{Harmonic Mean} = \frac{n}{\sum \frac{1}{Q}}$$

Where: n = number of flow values

and Q = flow value (cfs)

$$\text{Modified Harmonic Mean} = \left[\frac{\sum_{i=1}^{N_t - N_0}\left(\frac{1}{Q_i}\right)}{N_t - N_0}\right]^{-1} X \left[\frac{N_t - N_0}{N_t}\right]$$

Where: Q_i = nonzero flow

N_t = total number of flow values

and N_0 = number of zero flow values

J. Discharge Requirements

Water quality standards shall be the basis for managing discharges attributable to point and **non-point source**s of pollution. Water quality standards are not used to control, and are not invalidated by, **natural background** phenomena or acts of God.

K. Use Attainability

In the event that monitoring of water quality identifies reaches where attainable water quality is less than what is required by the Pueblo of Santa Ana Water Quality Standards, then the Pueblo of Santa Ana may modify the Water Quality Standards to reflect attainability. Modification thereof shall be within the sole discretion of the Pueblo of Santa Ana, but shall be subject to the provisions of the Clean Water Act, and

shall be carried out in accordance with **use-attainability analysis** procedures, development of a site specific standard, or other appropriate methods.

L. Authority

The Tribal Council has exclusive authority to adopt and modify the water quality standards. The Tribal Council also may revise the standards from time to time if deemed necessary by **use-attainability analysis** and as the need arises, or as a result of updated scientific information.

M. Correction of Errors in Standards

The Pueblo of Santa Ana will correct any errors resulting from inadequate and erroneous data. The discovery of such errors will not affect the validity of remaining and unaffected standards. If any provision of the Pueblo of Santa Ana Water Quality Standards, or the application of any provision of these Water Quality Standards to any person or circumstance, is held to be invalid, the application of such provision to other persons and circumstances and the remainder of the Water Quality Standards shall not be affected thereby.

N. Compliance Schedules

When requested, the Pueblo of Santa Ana shall consider on a case-by-case basis, whether a compliance schedule can be incorporated in an existing National Pollutant Discharge Elimination System ("**NPDES**") permit. Such a schedule of compliance will be for the purpose of providing a permittee with adequate time to make treatment facility modifications necessary to comply with the Pueblo of Santa Ana water quality standards. Compliance schedules may be included in **NPDES** permits at the time of permit renewal issuance or modification and shall require compliance at the earliest practicable time. Compliance schedules also shall specify milestone dates so as to measure progress towards final project completion.

O. Short-term Exceedances

The Pueblo of Santa Ana Tribal Council may authorize Short Term Exceedances by allowing activities that may cause temporary violations of the water quality standards if the Pueblo determines these activities are necessary to accommodate legitimate uses or emergencies, or to protect the public health and welfare. A short-term exceedance will only be allowed for activities that are not likely to cause permanent, or long term impairment of a **designated use** or beneficial uses. Such activities include, but are not limited to bank stabilization, grade control, **wetlands** restoration, **algae** and weed control, hydrological studies that use tracers, or activities that result in overall enhancement of or maintenance of **designated uses** or beneficial uses. The Pueblo shall specify the degree of exceedance, the time limit, and where applicable, restoration procedures. Such authorization shall not be granted for activities which could result in the adverse impact on any federally endangered or threatened species or on the critical habitat of such species or which could result in the irreversible degradation of the water quality. Nothing herein shall be intended to supersede existing Pueblo and federal permitting processes or requirements.

P. Pueblo Policy

The Pueblo of Santa Ana supports the goals of the Clean Water Act and will strive to preserve, protect, and restore the water resources of the Pueblo in their most "**natural condition**." Tribal management efforts will be consistent with preserving, protecting, and restoring the most natural aquatic and wildlife communities for **surface waters of the Pueblo of Santa Ana**. In all cases, established and existing uses and/or biological conditions will be protected pursuant to Section II of the Pueblo of Santa Ana's Water Quality Standards, **"Antidegradation Policy**."

Section II. ANTIDEGRADATION POLICY AND IMPLEMENTATION PLAN

A. Antidegradation Policy:

The **Antidegradation** Policy of the Pueblo is as follows:

1. Existing uses and water quality levels necessary to protect existing uses shall be maintained and protected.
2. Where existing water quality exceeds levels necessary to support propagation of fish and wildlife and recreation in and on the water, that level of water quality shall nonetheless be maintained and protected unless it is found, after full satisfaction of governmental and public participation requirements, that a lower level of water quality is required in order to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation of water quality, the Pueblo of Santa Ana shall impose the highest statutory and regulatory requirements for **point source**s and shall impose **best management practices** for **non-point source**s.
3. The Pueblo shall require the highest statutory and regulatory requirements for all new and existing **point source**s and all cost-effective and reasonable management practices for **non-point source** control.
4. The Pueblo of Santa Ana will evaluate and identify high quality waters described in Section II(A)(2) on a parameter-by-parameter basis.
5. Where high quality water constitutes an exceptional recreational, cultural, or ecological resource, those waters may be designated as Outstanding Tribal Resource Waters. No permanent degradation of Outstanding Tribal Resource Waters shall be permitted from their current condition for any reason.
6. Prior to lowering high water quality for waters described in Section II(A)(2), the Pueblo shall conduct an analysis of alternatives is, and if practicable alternatives are identified, then one of those alternatives may need to be selected in order for the lowering of the high-quality water to be allowed.
7. In those cases where potential water quality impairments associated with thermal discharge are involved, the **antidegradation** policy and implementation method shall be consistent with Section 316 of the Clean Water Act, as amended, (33 U.S.C. Section 1326 (1987)).

B. Implementation Plan

Acting under authority delegated by the Pueblo of Santa Ana Tribal Council, the Pueblo of Santa Ana Department of Natural Resources (DNR) shall implement the Pueblo of Santa Ana Water Quality Standards, including the **Antidegradation** Policy, by establishing and maintaining controls on the introduction of pollutants into **surface waters of the Pueblo**s. More particularly, the DNR shall do the following:

1. monitor water quality (chemical, physical, and biological) to assess the effectiveness of pollution controls and to determine whether water quality standards are being attained;
2. evaluate the impact of effluents on receiving waters;
3. advise prospective dischargers of discharge requirements;
4. review the adequacy of the existing data base identifying the Pueblo's waters, the data available to determine the quality of those waters and to compare to the **designated uses**

for those waters, and obtain additional data when required;

5. require the **Best Available Technology (BAT)** of wastewater treatment **practicable** to protect and maintain **designated uses** and existing water quality consistent with long-term environmental protection objectives;

6. develop water quality based **effluent** limitations and comment on technology-based **effluent** limitations, as appropriate, for inclusion in any federal permit issued to a discharger pursuant to Section 402 of the Clean Water Act (33 U.S.C. Section 1342), and review of Section 404 permits of the Clean Water Act (33 U.S.C. Section 1344);

7. require that these **effluent** limitations be included in any such permit as a condition for Tribal certification pursuant to Section 401 of the Clean Water Act, (33 U.S.C. Section 1341), provided that a reasonable time for compliance may be considered as part of the certification process for any existing permits.

8. coordinate water pollution control activities with other tribal, local, state, and federal agencies, as appropriate;

9. develop and pursue an inspection program and enforcement strategy in order to ensure that **National Pollutant Discharge Elimination Systems (NPDES)** dischargers comply with requirements of the Clean Water Act (CWA) and the Pueblo of Santa Ana Water Quality Standards and any requirements promulgated thereunder, and in order to support the compliance and enforcement of Federal **NPDES** permits by the U.S. Environmental Protection Agency;

10. encourage voluntary implementation of **best management practices** to control **non-point sources** of pollutants to achieve compliance with the Pueblo of Santa Ana Water Quality Standards;

11. ensure that the provisions for public participation required by these Standards and the Clean Water Act are followed;

12. determine if instream flows are adequate to support **designated uses** and meet narrative and numeric water quality standards, and if surface and groundwater withdrawals cause or contribute to degradation of unique surface or ground waters, in coordination with the Water Resources Division Manager;

13. implement policies and procedures to protect designated Outstanding Tribal Resource Waters according to an implementation plan adopted by the Tribal Council;

14. if necessary, in consultation with the WRDM and subject to the approval of Pueblo of Santa Ana Tribal Council, designate streams as perennial, intermittent or **ephemeral** and determine numeric low flow values; and

15. provide technical oversight and planning support to other departments within the Pueblo's administration and/or the Enterprises owned by the Pueblo in order to accomplish the objectives of the Water Quality Standards. These departments may include Santa Ana Gaming Commission, Hospitality, Tamaya Ventures, Tamaya Housing, Tribal Resources, Wellness, Agriculture, Natural Resources, Education and Maintenance.

Section III. GENERAL STANDARDS

Surface waters of the Pueblo shall be free of any **water contaminant** in such quantity and of such duration as may with reasonable probability injure human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of the property. The following **narrative standard**s apply to all **surface waters of the Pueblo of Santa Ana**, unless stricter or additional standards are imposed in SECTIONs IV and V below.

A. Stream Bottom Deposits

Surface waters of the Pueblo shall be free from **water contaminants** from other than natural causes that may settle and have a deleterious effect on the **aquatic biota** or that will significantly alter the physical or chemical properties of the water or the bottom sediments.

B. Floating Solids, Oil, and Grease

Surface waters of the Pueblo shall be free from objectionable oils, scum, foam, grease, and other floating materials and suspended substances resulting from other than natural causes (including visible films of oil, globules of oil, grease, or solids in or on the water, stream bottom or coatings on stream banks or that would damage or impair the normal growth, function or reproduction of wildlife, plant or aquatic life). In addition to discharges that result in visible films of oil, oil and grease discharged into **surface waters of the Pueblo** shall not exceed 10 **mg/l**iter average or 15 **mg/l**iter maximum.

C. Color

Surface waters of the Pueblo shall be free from true **color**-producing materials from other than natural causes that create an aesthetically undesirable condition. **Color** shall not impair the **designated** and other **attainable uses** of a water body. **Color**-producing substances from other than natural sources are limited to concentrations equivalent to 70 **color** units (CU).

D. Odor and Taste

Contaminants from other than natural causes may not impart unpalatable flavor to fish, and may not result in offensive water odor or taste (**organoleptic** effects), or otherwise interfere with the **designated** and other **attainable uses** of a water body. Taste and odor-producing substances from other than natural origins shall not interfere with the production of a potable water supply by modern treatment methods.

E. Nuisance Conditions

Plant **nutrients** or other substances stimulating algal growth from other than natural causes shall not be present in concentrations that produce objectionable algal densities or nuisance aquatic vegetation, or that result in a dominance of nuisance species in stream, or that cause **nuisance conditions** in any other fashion. Phosphorus and nitrogen concentrations shall not be permitted to reach levels which result in man-induced **eutrophication** problems. As a guideline, total phosphorus shall not exceed 100 µg/liter in streams or 50 µg/liter in lakes and reservoirs. Alternative or additional **nutrient** limitations for **surface waters of the Pueblo** may be established by the Pueblo of Santa Ana and incorporated into water quality management plans.

F. Pathogens

Surface waters of the Pueblo of Santa Ana shall be free of pathogens from other-than-natural causes in sufficient quantity to impair public health or the designated, existing uses of a surface water.

G. Turbidity

Turbidity attributable to other than natural causes shall not reduce light transmission to a point where

aquatic biota are inhibited or alter **color** or visibility to a point that causes an unaesthetic and substantial visible contrast with the natural appearance of the water. Specifically, **turbidity** shall not exceed 5 **NTU** over background when background **turbidity** is 50 **NTU** or less, with no more than a 10 percent increase when background **turbidity** is more than 50 **NTU**.

H. Mixing Zones

Where **effluent** is discharged into **surface waters of the Pueblo**, a continuous zone shall be maintained in which the water is of adequate quality to allow the migration of aquatic life with no significant effect on their population. The cross-sectional area of **effluent mixing zones** shall be ¼ or less than the cross-sectional area or flow volume of the receiving stream. **Mixing zone**s are not allowed in lakes. **Mixing zone**s containing permitted **effluent** shall not overlap locations of recreational or ceremonial activities (see SECTION IV, below). Water quality standards shall be maintained throughout **zones of passage. Zones of passage** in **intermittent streams** may be designated on a site specific basis. The water quality in a **zone of passage** shall not be permitted to fall below the standards for the designated water body within which the zone is contained. With regard to **toxicity** in **mixing zones**, see subsection III (O), below.

I. Radioactive Materials

Concentrations of gross alpha particle activity shall not exceed the concentration caused by naturally-occurring materials. Sources, special nuclear, and by-product materials as defined by the Atomic Energy Act of 1954 are excluded from this provision.

Table III: I-1. Radioactive Material Criteria.

Radiation Source or Radionuclide	**Limit (pCi/L)**
Radium-226 and Radium-228	5
Radon	300
Strontium-90	8
Tritium	20,000
Uranium	30
Gross Alpha*	15
Gross Beta**	50

pCi/L = (picoCuries per liter)

* Gross alpha particle concentrations, including Radium-226 but excluding radon and uranium, shall not exceed 15 **picocurie**s per liter.

** The average annual concentration of beta particles and of photon radioactivity from man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem/year.

J. Temperature

The introduction of heat by other than natural causes shall not increase the temperature in a stream, outside a **mixing zone**, by more than 2.7°C (5°F), based upon the monthly average of the maximum daily

temperatures measured at mid-depth or three feet (whichever is less) outside the **mixing zone**. In lakes, the temperature of the water column or **epilimnion** (if **thermal stratification** exists) shall not be raised more than 1.7°C (3°F) above that which existed before the addition of heat of artificial origin, based upon the average of temperatures taken from the surface to the bottom or surface to the bottom of the **epilimnion** (if stratified). The normal daily and seasonal variations that were present before the addition of heat from other than natural sources shall be maintained. In no case shall man-introduced heat be permitted when the maximum temperature specified for the reach (25°C/77°F for **coolwater aquatic life/fisheries** and 32.2°C/ 90°F for **warmwater aquatic life/fisheries**) would thereby be exceeded. Privately-owned lakes and reservoirs used in the process of cooling water for industrial purposes may be classified using a less stringent special-use standard for thermal components, provided, however, that the water released from any such lake or reservoir into a stream system meets the water quality standards of the receiving stream.

K. Salinity/Mineral Quality (Total Dissolved Solids, Chlorides, and Sulfates)

Existing mineral quality shall not be altered by municipal, industrial, and in stream activities, or other waste discharges so as to interfere with the **designated** or **attainable uses** for a water body. In no case shall an increase of more than 1/3 over **naturally-occurring** salinity/mineral levels be permitted, nor shall dischargers cause concentrations on streams with a **domestic water supply use** to exceed 250 mg/L for chlorides; 250 mg/L for sulfates; and 500 mg/L for total dissolved solids.

L. pH

The **pH** of a stream or lake shall not be permitted to fluctuate in excess of 1.0 unit over a period of 24 hours for other than natural causes.

M. Dissolved Oxygen

If a surface body of water is capable of supporting aquatic life, the **dissolved oxygen** standard will be a minimum of 5 **mg/l**. **Dissolved oxygen** values can be lower if caused by **natural condition**s and not an impairment to the native aquatic life.

N. Nitrogen and Other Dissolved Gases

Surface waters of the Pueblo shall be free of nitrogen and other dissolved gases at levels above 110% saturation when this supersaturation is attributable to municipal, industrial, or other discharges.

O. Toxic Substances

Toxic substances shall not be present in receiving waters in quantities that are toxic to human, animal, plant, or aquatic life, or in quantities that interfere with the normal propagation, growth, and survival of the sensitive **indigenous aquatic biota**. Within the **mixing zone**, there shall be no **acute toxicity**. There shall be no **chronic toxicity** at the edge of the **mixing zone**.

Water quality criteria for toxic substances in **surface waters of the Pueblo** with primary contact, aquatic life uses, domestic water supply use, or from which fish are caught for human consumption are found in Appendix A. The temperature and **pH**-dependent values for the ammonia criteria for aquatic life uses are designated in Appendix B.

1. For toxic substances lacking EPA published criteria, biomonitoring data may be used to determine compliance with this **narrative standard** in accordance with EPA standard

acute and chronic biological test protocols. These protocols can be found in:

a. *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, EPA-821-R-02-012; October 2002, or the most current revision thereof;

b. *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*; EPA-821-R02-013; October 2002 or the most current revision thereof;

c. *Technical Support Document for Water Quality-Based Toxics Control*, EPA/505/2- 90-001; March 1991, or the most current revision thereof;

d. Post Third Round NPDES Permit Implementation Strategy; adopted October 1, 1992, or the most current revision thereof; and

e. U.S. Environmental Protection Agency, "*Quality Criteria for Water, 1986"*, or the most current revision thereof.

2. Should numeric criteria need to be derived without actually conducting **toxicity** tests, the AQUIRE (AQUatic **toxicity** Information REtrieval) database and EPA's *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and their Uses*, will be applied to calculate any criteria. In the event that sufficient data is not available to derive a numeric criterion following the above protocol, toxicological study results may be used to calculate a criterion based on the following methods:

   a. Concentrations of non-**persistent** toxic materials shall not exceed concentrations which are chronically toxic (as determined from appropriate **chronic toxicity** data, or calculated as ten percent of the LC_{50} values) to representative, sensitive, aquatic organisms;

   b. Concentrations of **persistent** toxic materials that do not **bioaccumulate, bioconcentrate,** or **biomagnify,** shall not exceed concentrations which are chronically toxic (as determined from appropriate **chronic toxicity** data or calculated as five percent of the LC_{50} values) to representative, sensitive, aquatic organisms;

   c. Concentrations of toxic materials that **bioaccumulate, bioconcentrate,** or **biomagnify** shall not exceed concentrations which are chronically toxic (as determined from appropriate **chronic toxicity** data or calculated as one percent of the LC_{50} values) to representative, sensitive, aquatic organisms;

   d. Toxicants in receiving waters that are known to be **persistent**, bioaccumulative, **carcinogenic**, and/or synergistic with other waste stream components shall be addressed on a case-by-case basis. Sources of information include final or draft **MCL**s and current Health Advisories (HA) for organic and inorganic chemicals, radionuclides and microorganisms.

P. Biocriteria

Biological integrity, the protection of aquatic communities in their most **natural condition**, shall be protected and maintained through this narrative statement. Biocriteria, including sampling of aquatic communities and the use of multi-metric indices, will be applied to protect all categories of waters with an aquatic life use. The application of biological criteria will be based on the requirement that the biological

integrity of waters impacted by **point source** pollution**, non-point source** pollution, and other anthropogenic factors will not be significantly impaired when compared to least impacted watersheds that are otherwise similar in their characteristics. The biological community structure, function, and habitat of waters shall be restored to and/or protected and maintained at the highest potential use. Reference locations will be selected representing **natural condition**s in which **indigenous** aquatic communities are healthy and can reproduce fertile offspring. The biological integrity of the **surface waters of the Pueblo**, as measured by multi-metric indices of benthic macroinvertebrates, fish, periphyton, or other appropriate indicators, shall not significantly differ from reference waters, taking into account variability. A significant adverse alteration of the biological integrity of the waters constitutes a violation of these water quality standards.

Q. Sediment Quality

Man-made or man induced activities shall not result in sediment with contaminants at concentrations which are toxic if absorbed by **aquatic biota**, livestock, wildlife or man or in quantities that interfere with normal propagation, growth, and survival of the existing **aquatic biota**. The chemicals listed in Table III: Q-1 serve as a guideline in order to identify a concentration that if discovered might cause unacceptable ecological risks for **aquatic biota** and would warrant further investigation into the source and assist in clean-up of existing sediment contamination. These numeric values will be incorporated as part of the Pueblo of Santa Ana's water quality monitoring program and are not intended to be used in the calculation of effluent limitations in **NPDES** permits at this time.

EPA took no action on the sediment quality guidelines for ten parameters included under Part Q. Sediment Quality. These guidelines may be used in the Pueblo of Santa Ana's monitoring and assessment program, but are not intended as numeric criteria in regulatory programs. The underlined text is not effective for CWA purposes.

EPA took no action on the sediment quality guidelines for ten parameters included under Part Q. Sediment Quality. These guidelines may be used in the Pueblo of Santa Ana's monitoring and assessment program, but are not intended as numeric criteria in regulatory programs. The underlined text is not effective for CWA purposes.

Table III: Q-1. Sediment Quality Guidelines Above Which Harmful Effects Are Likely to Be Observed in Aquatic Life. *

Metals	**Limit (mg/Kg)**
Arsenic	33.0
Cadmium	4.98
Chromium	111.0
Copper	149.0
Lead	128.0
Mercury	1.06
Nickel	48.6
Zinc	459.0
Organic Chemicals	**Limit (mg/Kg)**
Total Polycyclic Aromatic Hydrocarbons	22.8
Total Polychlorinated Biphenyls	0.68

mg/Kg = (milligrams per kilogram dry weight)

*MacDonald, D.D., C.G. Ingersoll, and T. Berger.2000. *Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems*. Archives of Environmental Contamination and Toxicology 39:20-31.

Section IV. WATER BODY USES AND STANDARDS SPECIFIC TO THE USES

This section describes the **designated uses** of the water bodies on the Pueblo of Santa Ana that are to be preserved and protected by these water quality standards. Specific criteria for each use are included. In addition to the specific uses listed, the Section III, General Standards also apply to each use listed in this section. Table IV-1 contains a summary of the **designated uses** as they are applied to the waters of the Pueblo.

A. Coolwater Aquatic Life/Fishery Use.

A Coolwater aquatic life/fishery is a river or stream reach, lake, or impoundment where water temperature and other characteristics are suitable for support and propagation of both coldwater- and warmwater-adapted aquatic life on a transitional basis including but not limited to, individual species of green plants, **algae**, fungi, macroinvertebrates, fish (such as longnose dace, Rio Grande chub, Rio Grande sucker, brown trout, cutthroat trout, brook trout, rainbow trout, and walleye), shellfish, snails, frogs, turtles, salamanders, or other aquatic plants and animals but where temperature and other characteristics may not always be suitable for propagation of coldwater fish.

Standards specific to the use are as follows:

1. **Dissolved oxygen** minimum: 6 **mg/l**;
2. Temperature maximum: 25°C (77°F);
3. **pH** range: 6.6-9.0 SU;
4. The total ammonia standards designated in Appendix B; and
5. Tables A1, “Fresh Water Aquatic Criteria” and A2, “Human Health Criteria” of Appendix A apply to this use.

B. Warmwater Aquatic Life/Fishery Use

A **warmwater aquatic life/fishery** is a river or stream reach, lake, or impoundment where water temperature and other characteristics are suitable for support and propagation of warmwater adapted aquatic life including but not limited to, individuals or species of green plants, **algae**, fungi, macroinvertebrates, fish (such as cyprinids, minnows, carpsuckers, largemouth black bass, smallmouth black bass, crappie, white bass, bluegill, channel catfish, bullhead catfish or live-bearers), shellfish, snails, frogs, turtles, salamanders, or other aquatic plants and animals.

Standards specific to the use are as follows:

1. **Dissolved oxygen** minimum: 5 **mg/l**;
2. Temperature maximum: 32.2°C (90°F);
3. **pH** range: 6.6-9.0 SU;
4. The total ammonia standards designated in Appendix B; and
5. Tables A1, “Fresh Water Aquatic Criteria” and A2, “Human Health Criteria” of Appendix A apply to this use.

Table IV-1 Designated Uses for Each Water Body	Designated Use	Coolwater Aquatic Life/Fishery Use	Warmwater Aquatic Life/Fishery Use	Primary Contact Ceremonial Use	Primary Contact Recreational Use	Agricultural Water Supply Use	Wildlife Habitat Use
Water Body							
Rio Jemez							
Rio Jemez Reach 1 (Confluence to Rio Jemez Dam)		×	×	×	×	×	×
Rio Jemez Reach 2 (Jemez Canyon Dam to USGS Weir)		×	×	×	×	×	×
Rio Jemez Reach 3 (USGS Weir to Tamaya Bridge)		×	×	×	×	×	×
Rio Jemez Reach 4 (Tamaya Bridge to Zia Border)		×	×	×	×	×	×
Rio Grande							
Rio Grande Reach 1 (South Border to Hyatt Tamaya)		×	×	×	×	×	×
Rio Grande Reach 2 (Hyatt Tamaya to Confluence)		×	×	×	×	×	×
Rio Grande Reach 3 (Confluence to North Pueblo Border)		×	×	×	×	×	×
Ditches							
MRGCD Main Reach			×		×	×	×
Riverside Drain Reach		×	×		×	×	×
Ponds							
Ponds			×	×	×	×	×
Arroyos/Springs							
Arroyos/Springs			×	×	×	×	×

C. Primary Contact Ceremonial Use

Primary contact ceremonial use means the use of a stream, reach, lake, or impoundment for religious or traditional purposes by members of the Pueblo of Santa Ana; such use involves immersion, intentional or incidental ingestion of water, and requires protection of sensitive and valuable aquatic life and riparian habitat. The results for E. coli may be reported as either colony forming units (cfu) or the most probable number (MPN), depending on the analytical method used.

Standards specific to the use are as follows:

1. ***Escherichia coli***[4]:
    a. **geometric mean** maximum: 50 CFU/100 ml; or
    b. **Statistical Threshold Value (STV)** of 160 CFU/100 ml, in accordance with an illness rate of 4 per 1,000 exposures;
2. **pH** range: 6.6-9.0 SU;
3. All waters shall be free from **algae** in concentrations causing a **nuisance condition** or causing gastrointestinal or skin disorders; and
4. Table A2, "Human Health Criteria" of Appendix A apply to this use.

D. Primary Contact Recreational Use

Primary contact recreational use means the recreational use of a stream, reach, lake, or impoundment involving prolonged contact and a substantial risk of ingesting water; examples are swimming, bathing and inner tubing. The results for E. coli may be reported as either colony forming units (cfu) or the most probable number (MPN), depending on the analytical method used.

Standards specific to the use are:

1. ***Escherichia coli***:
    a. **geometric mean** maximum: 100 CFU/100 ml; or
    b. **STV** of 320 CFU/100 ml, in accordance with an illness rate of 7 per 1,000 exposures;
2. **pH** range: 6.6-9.0 SU;
3. All waters shall be free from **algae** in concentrations causing a **nuisance condition** or causing gastrointestinal or skin disorders; and
4. Table A2, "Human Health Criteria" of Appendix A apply to this use.

[4] ***Escherichia coli*** limits are derived from *2012 Recreational Water Quality Criteria*, USEPA 2012 (EPA-HQ-OW-2011-0466-0328) using the calculations described in *Calculations Performed in Developing the Proposed 2012 RWQC Values*, EPA 2012 (EPA-HQ-OW-2011-0466-0332).

E. Domestic Water Supply Use

Domestic water supply use means the use of water for human consumption with minimal treatment at the point of diversion from the source.

Standards specific to the use are:

1. **pH** range: 6.0-9.0 SU; and
2. Table A2, 'Human Health Criteria' of Appendix A apply to this use.

F. Agricultural water supply use

Agricultural water supply use means the use of water for irrigation and livestock watering.

Standards specific to the use are:

1. Concentration of the substances listed in Table IV: G-1 shall not exceed the listed criteria; and

Table IV: G-1: Livestock and Irrigation Criteria:

Substance	Livestock	Irrigation
Dissolved Boron	5.0 **mg/l**	0.75 **mg/l**
Dissolved Cobalt	1.0 **mg/l**	0.05 **mg/l**
Dissolved Lithium	--	2.5 **mg/l**
Dissolved Molybdenum	--	1.0 **mg/l**
Dissolved Vanadium	0.1 **mg/l**	0.1 **mg/l**

2. **turbidity** shall not exceed 5 **NTU** over background when background **turbidity** is 50 **NTU** or less, with no more than a 10% increase when background turbidity is more than 50 **NTU**.

G. Wildlife Habitat Use

Wildlife habitat use means **surface waters of the Pueblo** including **wetlands** that are suitable to support and propagate animal and plant species. **Wildlife habitat** will be free from any substances at concentrations that are toxic to or will adversely affect animal and plant species that use the environments for feeding, drinking, habitat or propagation, or can **bioaccumulate** and impair the community of animals in a watershed or the ecological integrity of **surface waters of the Pueblo of Santa Ana**.

Standards specific to use are:

1. Tables A1, 'Fresh Water Aquatic Criteria' and A2, 'Human Health Criteria' of Appendix A apply to this use; and
2. The discharge of substances which **bioaccumulate,** in excess of levels specified in current research, is not allowed.

Section V. USES AND SELECTED STANDARDS FOR DESIGNATED WATER BODIES

A. Rio Jemez Reach 1

The uses and standards are as follows for the **segment** of the Rio Jemez that passes through the Pueblo of Santa Ana Reservation, from a easternmost point at the confluence with the Rio Grande at Rio Grande River Mile (RM) 208.43 (designated as RM 0 for the Rio Jemez) with coordinates of Northing 1590186 and Easting 1561404[5] (latitude 35.3703429 and longitude -106.5150399), to a westernmost point at the Jemez Canyon Dam outlet at Rio Jemez RM 3.0 with coordinates of Northing 1599042 and Easting 1552355 (latitude 35.3946042 and longitude -106.5454822).

1. Uses:
   a. **Coolwater aquatic life/fishery** use;
   b. **Warmwater aquatic life/fishery** use;
   c. **Primary contact ceremonial** use;
   d. **Primary contact recreational** use;
   e. **Domestic water supply** use;
   f. **Agricultural water supply** use; and
   g. **Wildlife habitat use**.
2. Standards:
   a. **Dissolved oxygen** minimum: 6 **mg/l**;
   b. Temperature maximum: 25°C (77°F);
   c. **pH** range: 6.6-9.0 SU; and
   d. ***Escherichia coli***:
      i **geometric mean** maximum: 50 CFU/100 ml;
      ii Statistical Threshold Value (STV) of 160 CFU/100 ml, in accordance with an illness rate of 4 per 1,000 exposures; or
      iii Beach Action Value (BAV) of 90 CFU/100mL.

EPA took no action on the Beach Action Values adopted for each water body under Section V. In the Response to Comments on the proposed standards, the Pueblo of Santa Ana noted that it will use these values to communicate the risks associated with potential bacteriological contamination of the Pueblo's waters. The underlined text is not effective for CWA purposes.

[5] All coordinates are in NAD 1983 State Plane New Mexico Central FIPS 3002 (US Feet) and decimal degrees of latitude and longitude.

B. Rio Jemez Reach 2

The uses and standards are as follows for the **segment** of the Rio Jemez that passes through the Pueblo of Santa Ana Reservation, from a easternmost point at the Jemez Canyon Dam outlet at Rio Jemez RM 3.0 with coordinates of Northing 1599042 and Easting 1552355 (latitude 35.3946042 and longitude -106.5454822), to a westernmost point at the Jemez Weir at Rio Jemez RM 6.37 with coordinates of Northing 1603280 and Easting 1539094 (latitude 35.406131 and longitude -106.5900264).

1. Uses:
    a. **Coolwater aquatic life/fishery** use;
    b. **Warmwater aquatic life/fishery** use;
    c. **Primary contact ceremonial** use;
    d. **Primary contact recreational** use;
    e. **Domestic water supply** use;
    f. **Agricultural water supply** use;
    g. **Wildlife habitat use**.
2. Standards:
    a. **Dissolved oxygen** minimum: 6 **mg/l**;
    b. Temperature maximum: 25°C (77°F);
    c. **pH** range: 6.6-9.0 SU; and
    d. ***Escherichia coli***:
        i **geometric mean** maximum: 50 CFU/100 ml;
        ii Statistical Threshold Value (STV) of 160 CFU/100 ml, in accordance with an illness rate of 4 per 1,000 exposures; or
        iii Beach Action Value (BAV) of 90 CFU/100mL.

EPA took no action on the Beach Action Values adopted for each water body under Section V. In the Response to Comments on the proposed standards, the Pueblo of Santa Ana noted that it will use these values to communicate the risks associated with potential bacteriological contamination of the Pueblo's waters. The underlined text is not effective for CWA purposes.

C. Rio Jemez Reach 3

The uses and standards are as follows for the **segment** of the Rio Jemez that passes through the Pueblo of Santa Ana Reservation, from a easternmost point at the Jemez Weir at Rio Jemez RM 6.37 with coordinates of Northing 1603280 and Easting 1539094 (latitude 35.406131 and longitude -106.5900264), to a westernmost point at the Tamaya Bridge at Rio Jemez RM 9.06 with coordinates of Northing 1611555 and Easting 1529965 (latitude 35.428776 and longitude -106.6207658).

1. Uses:
    a. **Coolwater aquatic life/fishery** use;
    b. **Warmwater aquatic life/fishery** use;
    c. **Primary contact ceremonial** use;
    d. **Primary contact recreational** use;
    e. **Domestic water supply** use;
    f. **Agricultural water supply** use; and
    g. **Wildlife habitat use**.
2. Standards:
    a. **Dissolved oxygen** minimum: 6 **mg/l**;
    b. Temperature maximum: 25°C (77°F);
    c. **pH** range: 6.6-9.0 SU; and
    d. ***Escherichia coli***:
        i **geometric mean** maximum: 50 CFU/100 ml;
        ii Statistical Threshold Value (STV) of 160 CFU/100 ml, in accordance with an illness rate of 4 per 1,000 exposures; or
        iii Beach Action Value (BAV) of 90 CFU/100mL.

EPA took no action on the Beach Action Values adopted for each water body under Section V. In the Response to Comments on the proposed standards, the Pueblo of Santa Ana noted that it will use these values to communicate the risks associated with potential bacteriological contamination of the Pueblo's waters. The underlined text is not effective for CWA purposes.

D. Rio Jemez Reach 4

The uses and standards are as follows for the **segment** of the Rio Jemez that passes through the Pueblo of Santa Ana Reservation, from a easternmost point at the Tamaya Bridge at Rio Jemez RM 9.06 with coordinates of Northing 1611555 and Easting 1529965 (latitude 35.428776 and longitude -106.6207658), to a westernmost point where the Rio Jemez crosses the Zia Border at Rio Jemez RM 13.57 with coordinates of Northing 1628273 and Easting 1514432 (latitude 35.474536 and longitude -106.6731464).

1. Uses:
    a. **Coolwater aquatic life/fishery** use;
    b. **Warmwater aquatic life/fishery** use;
    c. **Primary contact ceremonial** use;
    d. **Primary contact recreational** use;
    e. **Domestic water supply** use;
    f. **Agricultural water supply** use; and
    g. **Wildlife habitat use**.
2. Standards:
    a. **Dissolved oxygen** minimum: 6 **mg/l**;
    b. Temperature maximum: 25°C (77°F);
    c. **pH** range: 6.6-9.0 SU; and
    d. ***Escherichia coli***:
        i **geometric mean** maximum: 50 CFU/100 ml;
        ii Statistical Threshold Value (STV) of 160 CFU/100 ml, in accordance with an illness rate of 4 per 1,000 exposures; or
        iii Beach Action Value (BAV) of 90 CFU/100mL.

EPA took no action on the Beach Action Values adopted for each water body under Section V. In the Response to Comments on the proposed standards, the Pueblo of Santa Ana noted that it will use these values to communicate the risks associated with potential bacteriological contamination of the Pueblo's waters. The underlined text is not effective for CWA purposes.

E. Rio Grande Reach 1

The uses and standards are as follows for the **segment** of the Rio Grande that passes through the Pueblo of Santa Ana Reservation, from a southernmost point where the Rio Grande crosses out of the Pueblo's southern boundary at Rio Grande RM 203.96 with coordinates of Northing 1573350 and Easting 1548885 (latitude 35.3239866 and longitude -106.5568581), to a northernmost point at the nick point at RM 205.8 with coordinates of Northing 1580865 and Easting 1553990 (latitude 35.3446763 and longitude -106.5398176).

1. Uses:
    a. **Coolwater aquatic life/fishery** use;
    b. **Warmwater aquatic life/fishery** use;
    c. **Primary contact ceremonial** use;
    d. **Primary contact recreational** use;
    e. **Domestic water supply** use;
    f. **Agricultural water supply use**; and
    g. **Wildlife habitat use**.
2. Standards:
    a. **Dissolved oxygen** minimum: 6 **mg/l**;
    b. Temperature maximum: 25°C (77°F);
    c. **pH** range: 6.6-9.0 SU; and
    d. ***Escherichia coli***:
        i **geometric mean** maximum: 50 CFU/100 ml;
        ii Statistical Threshold Value (STV) of 160 CFU/100 ml, in accordance with an illness rate of 4 per 1,000 exposures; or
        iii Beach Action Value (BAV) of 90 CFU/100mL.

EPA took no action on the Beach Action Values adopted for each water body under Section V. In the Response to Comments on the proposed standards, the Pueblo of Santa Ana noted that it will use these values to communicate the risks associated with potential bacteriological contamination of the Pueblo's waters. The underlined text is not effective for CWA purposes.

F. Rio Grande Reach 2

The uses and standards are as follows for the **segment** of the Rio Grande that passes through the Pueblo of Santa Ana Reservation, from a southernmost point at the nick point at RM 205.8 with coordinates of Northing 1580865 and Easting 1553990 (latitude 35.3446763 and longitude -106.5398176), to a northernmost point at the confluence with the Rio Jemez at Rio Grande RM 208.43 with coordinates of Northing 1590186.00188 and Easting 1561403.79235 (latitude 35.3703429 and longitude -106.5150399).

1. Uses:
    a. **Coolwater aquatic life/fishery** use;
    b. **Warmwater aquatic life/fishery** use;
    c. **Primary contact ceremonial** use;
    d. **Primary contact recreational** use;
    e. **Domestic water supply** use;
    f. **Agricultural water supply** use; and
    g. **Wildlife habitat use**.
2. Standards:
    a. **Dissolved oxygen** minimum: 6 **mg/l**;
    b. Temperature maximum: 25°C (77°F);
    c. **pH** range: 6.6-9.0 SU; and
    d. ***Escherichia coli***:
        i **geometric mean** maximum: 50 CFU/100 ml;
        ii Statistical Threshold Value (STV) of 160 CFU/100 ml, in accordance with an illness rate of 4 per 1,000 exposures; or
        iii Beach Action Value (BAV) of 90 CFU/100mL.

EPA took no action on the Beach Action Values adopted for each water body under Section V. In the Response to Comments on the proposed standards, the Pueblo of Santa Ana noted that it will use these values to communicate the risks associated with potential bacteriological contamination of the Pueblo's waters. The underlined text is not effective for CWA purposes.

G. Rio Grande Reach 3

The uses and standards are as follows for the **segment** of the Rio Grande that passes through the Pueblo of Santa Ana Reservation, from a southernmost point at the confluence with the Rio Jemez at Rio Grande RM 208.43 with coordinates of Northing 1590186 and Easting 1561404 (latitude 35.3703429 and longitude -106.5150399), to a northernmost point where the Rio Grande encounters the Pueblo boundary at Rio Grande RM 209.67 with coordinates of Northing 1594059 and Easting 1564991 (latitude 35.3810097 and longitude -106.503041).

1. Uses:
    a. **Coolwater aquatic life/fishery** use;
    b. **Warmwater aquatic life/fishery** use;
    c. **Primary contact ceremonial** use;
    d. **Primary contact recreational** use;
    e. **Domestic water supply** use;
    f. **Agricultural water supply** use; and
    g. **Wildlife habitat use**.
2. Standards:
    a. **Dissolved oxygen** minimum: 6 **mg/l**;
    b. Temperature maximum: 25°C (77°F);
    c. **pH** range: 6.6-9.0 SU; and
    d. ***Escherichia coli***:
        i **geometric mean** maximum: 50 CFU/100 ml;
        ii Statistical Threshold Value (STV) of 160 CFU/100 ml, in accordance with an illness rate of 4 per 1,000 exposures; or
        iii Beach Action Value (BAV) of 90 CFU/100mL.

EPA took no action on the Beach Action Values adopted for each water body under Section V. In the Response to Comments on the proposed standards, the Pueblo of Santa Ana noted that it will use these values to communicate the risks associated with potential bacteriological contamination of the Pueblo's waters. The underlined text is not effective for CWA purposes.

H. Middle Rio Grande Conservancy District Albuquerque Main Canal

The uses and standards are as follows for the **segment** of the MRGCD Albuquerque Main Canal that passes through the Pueblo of Santa Ana Reservation, from a southernmost point where the MRGCD Albuquerque Main Canal leaves the Pueblo boundary at coordinates of Northing 1586073 and Easting 1563345 (latitude 35.3341723 and longitude -106.5353073), to a northernmost point where the MRGCD Albuquerque Main Canal enters the Pueblo boundary at coordinates of Northing 1577038 and Easting 1555324 (latitude 35.3590565 and longitude -106.508493).

1. Uses:
    a. **Warmwater aquatic life/fishery** use;
    b. **Primary contact recreational** use;
    c. **Agricultural water supply** use; and
    d. **Wildlife habitat use**.
2. Standards:
    a. **Dissolved oxygen** minimum: 5 **mg/l**;
    b. Temperature maximum: 32.2°C (90°F);
    c. **pH** range: 6.6-9.0 SU; and
    d. ***Escherichia coli***:
        i **geometric mean** maximum: 100 CFU/100 ml;
        ii Statistical Threshold Value (STV) of 320 CFU/100 ml, in accordance with an illness rate of 7 per 1,000 exposures; or
        iii Beach Action Value (BAV) of 190 CFU/100mL.

EPA took no action on the Beach Action Values adopted for each water body under Section V. In the Response to Comments on the proposed standards, the Pueblo of Santa Ana noted that it will use these values to communicate the risks associated with potential bacteriological contamination of the Pueblo's waters. The underlined text is not effective for CWA purposes.

I. Riverside Drain

The uses and standards are as follows for the **segment** of the Riverside Drain that passes through the Pueblo of Santa Ana Reservation, from a southernmost point where the Riverside Drain leaves the Pueblo boundary at coordinates of Northing 1586176 and Easting 1561740 (latitude 35.3283982 and longitude -106.5517788), to a northernmost point where the Riverside Drain enters the Pueblo boundary at coordinates of Northing 1574951 and Easting 1550405 (latitude 35.3593279 and longitude -106.513877).

1. Uses:
    a. **Coolwater aquatic life/fi**shery use;
    b. **Warmwater aquatic life/fishery** use;
    c. **Primary contact recreational** use;
    d. **Agricultural water supply** use; and
    e. **Wildlife habitat use**.
2. Standards:
    a. **Dissolved oxygen** minimum: 6 **mg/l**;
    b. Temperature maximum: 25°C (77°F);
    c. **pH** range: 6.6-9.0 SU; and
    d. ***Escherichia coli***:
        i **geometric mean** maximum: 100 CFU/100 ml;
        ii Statistical Threshold Value (STV) of 320 CFU/100 ml, in accordance with an illness rate of 7 per 1,000 exposures; or
        iii Beach Action Value (BAV) of 190 CFU/100mL.

EPA took no action on the Beach Action Values adopted for each water body under Section V. In the Response to Comments on the proposed standards, the Pueblo of Santa Ana noted that it will use these values to communicate the risks associated with potential bacteriological contamination of the Pueblo's waters. The underlined text is not effective for CWA purposes.

J. Ponds

The uses and standards are as follows for all ponds not otherwise designated under these standards.

1. Uses:
    a. **Warmwater aquatic life/fishery** use;
    b. **Primary contact ceremonial** use;
    c. **Primary contact recreational** use;
    d. **Agricultural water supply** use; and
    e. **Wildlife habitat use**.
2. Standards:
    a. **Dissolved oxygen** minimum: 5 **mg/l**;
    b. Temperature maximum: 32.2°C (90°F);
    c. **pH** range: 6.6-9.0 SU; and
    d. ***Escherichia coli***:
        i **geometric mean** maximum: 50 CFU/100 ml;
        ii Statistical Threshold Value (STV) of 160 CFU/100 ml, in accordance with an illness rate of 4 per 1,000 exposures; or
        iii Beach Action Value (BAV) of 90 CFU/100mL.

EPA took no action on the Beach Action Values adopted for each water body under Section V. In the Response to Comments on the proposed standards, the Pueblo of Santa Ana noted that it will use these values to communicate the risks associated with potential bacteriological contamination of the Pueblo's waters. The underlined text is not effective for CWA purposes.

K. Arroyos/Ephemeral Streams/Springs

The uses and standards are as follows for all **arroyos**, **ephemeral streams** and springs not otherwise designated in these standards.

1. Uses:
    a. **Warmwater aquatic life/fishery** use;
    b. **Primary contact ceremonial** use;
    c. **Primary contact recreational** use;
    d. **Domestic water supply** use;
    e. **Agricultural water supply** use; and
    f. **Wildlife habitat use**.
2. Standards:
    a. **Dissolved oxygen** minimum: 5 **mg/l**;
    b. Temperature maximum: 32.2°C (90°F);
    c. **pH** range: 6.6-9.0 SU; and
    d. ***Escherichia coli***:
        i **geometric mean** maximum: 50 CFU/100 ml;
        ii Statistical Threshold Value (STV) of 160 CFU/100 ml, in accordance with an illness rate of 4 per 1,000 exposures; or
        iii Beach Action Value (BAV) of 90 CFU/100mL.

EPA took no action on the Beach Action Values adopted for each water body under Section V. In the Response to Comments on the proposed standards, the Pueblo of Santa Ana noted that it will use these values to communicate the risks associated with potential bacteriological contamination of the Pueblo's waters. The underlined text is not effective for CWA purposes.

Section VI. SAMPLING AND ANALYSIS

EPA took no action on Part A. Sample Collection, Preservation, and Analysis. The underlined text is not effective for CWA purposes.

A. Sample collection, preservation, and analysis

Sample collection, preservation, and analysis used to determine water quality and to maintain the standards set forth in the Water Quality Standards shall be performed in accordance with procedures prescribed by the latest edition of the EPA approved "*Pueblo of Santa Ana Quality Assurance Project Plan for Surface Water Quality Monitoring Program"(QAPP)*. As described in the QAPP, for any activities not specifically covered under the QAPP, any of the following authorities will be used to determine the sample collection, preservation and analysis requirements: (1) American Public Health Association, *Standard Methods for the Examination of Water and Wastewater;* (2) "Methods for Chemical Analysis of Water and Wastes"; or (3) "EPA Guidelines Establishing Test Procedures for the Analysis of Pollutants."

B. Bacteriological Surveys:

The monthly **geometric mean** is used in assessing attainment of standards when a minimum of five samples is collected in a 90-day period. When less than 5 samples are collected in a 90-day period, no single sample shall exceed STV for bacterial density set forth in SECTION IV. All results for single samples above the BAV will be assessed to determine if **designated uses** are threatened.

C. Sampling Procedures:

EPA took no action on Part C. Sampling Procedures. The underlined text is not effective for CWA purposes.

1. Streams and Ditches:

Stream monitoring stations will be those specified in the EPA-approved QAPP. Any deletions, additions, or changes to these monitoring stations will be made following the requirements specified in the QAPP and submitted for approval in the next revision of the QAPP. Additional monitoring may be conducted as determined by the Pueblo on an as-needed basis to assess any newly recognized water quality issues.

2. Ponds:

Sampling stations in ponds shall be located where the attainment of a water quality standard is to be assessed. Water quality measurements may be taken at intervals in the water column at a sampling station. For toxic substances and **nutrients**, the entire water column shall be sampled. For **dissolved oxygen** measurements will be made at intervals throughout the entire water column. In stratified ponds these measurements shall include the **epilimnion** as well as other strata.

3. Arroyos, Springs, and Stormwater Runoff:

Sampling stations in arroyos, springs and for stormwater runoff shall be located where the attainment of a water quality standard is to be assessed. This additional monitoring may be conducted as determined by the Pueblo on an as-needed basis to assess any newly recognized water quality issues.

Section VII. DEFINITIONS [6]

1. Acute toxicity

Toxicity which exerts short term lethal impacts on representative organisms with a duration of exposure generally less than or equal to 48 hours. **Acute toxicity** shall be determined in accordance with procedures specified in EPA 821-R-02-012, "*Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms."* Other methods may be used as appropriate to determine acute effects other than lethality, such as, but not limited to behavioral changes or immobilization.

2. Agricultural water supply use

The use of water for irrigation and livestock.

3. Algae

Simple plants without roots, stems, or leaves, which contain chlorophyll and are capable of photosynthesis.

4. Antidegradation

The policy set forth in the Pueblo of Santa Ana Water Quality Standards whereby **existing uses** and the level of water quality necessary to maintain those uses is maintained and protected (See 40 C.F.R. Section 131.12 (1987)).

5. Aquatic biota

Animal and plant life in the water.

6. Arroyo

A small, deep, flat-floored channel or gully of an **ephemeral** or **intermittent** stream, usually with nearly vertical banks cut, into unconsolidated material. A term commonly used in the arid and semiarid regions of the Southwestern United States. They are usually dry except after heavy rainfall.

7. Attainable use

A use of a surface water body which has the level of water quality and other characteristics that are needed to support the use, or which would have the level of water quality and other characteristics needed to support the use upon implementation of effluent limits required under sections 301(b) and 306 of the **Clean Water Act** and implementation of reasonable **BMPs** for **non-point source** control.

8. Best Available Technology (BAT)

A term applied with regulations on limiting pollutant discharges. The term constitutes moving targets on practices for abatement with advancing techniques which are currently regarded as "reasonably achievable", "best practicable" and "best available".

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[6] Words and terms defined in this Section are designated in bold wherever used in the text of the "Pueblo of Santa Ana Water Quality Standards."

9. Best management practices (BMP)

Practices undertaken to control, restrict, and diminish **point** and **non-point sources** of pollution, that are consistent with the purposes of the Pueblo of Santa Ana Water Quality Standards and with the narrative and numeric standards contained therein. **BMPs** are measures, sometimes structural, that are determined to be the most effective practical means of preventing or reducing pollution of water bodies. For NPDES permitting purposes **BMPs** may include (but are not limited to) schedules of activities, prohibitions of practices, maintenance procedures and other management practices to prevent or reduce the pollution of waters. **BMPs** also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal or drainage from raw material storage.

10. Bioaccumulate

The process by which a compound is taken up by an aquatic organism, both from water and through food.

11. Bioconcentrate

The process by which a compound is absorbed from water through gills or epithelial tissues and is concentrated in the body.

12. Biomagnify

The process by which the concentration of a compound increases in species occupying successive trophic levels.

13. CASRN

Acronym for "Chemical Abstracts Service Registry Number". Chemical Abstracts Service Registry Numbers are unique identifiers for chemical substances used to bridge the many differences in systematic, generic, proprietary, and trivial names of chemical substances, linking them with their correct molecular structure.

14. Carcinogenic

Cancer producing.

15. Chronic toxicity

Toxicity which exerts sub-lethal negative effects such as impairment of growth or reproduction, or which becomes lethal after long- term exposure, generally measured in a seven (7) day test on representative sensitive organisms. **Chronic toxicity** shall be determined in accordance with procedures specified in EPA-821-R02-013, "*Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms*." Other methods may be used as appropriate.

16. Clean Water Act

The Federal Water Pollution Control Act, also known more commonly as the **Clean Water Act**, came into effect in 1972. The principal body of law in effect is based on the Federal Water Pollution Control Amendments of 1972 and was significantly expanded from the Federal Water Pollution Control Amendments of 1948. Major amendments were enacted in the **Clean Water Act** of 1977 and the Water Quality Act of 1987. The **Clean Water Act** also provides for the development of water quality standards by States and Tribes to restore and maintain the chemical, physical and biological integrity of their waters.

17. Color

True **color** as well as apparent **color**. True **color** is the **color** of the water from which **turbidity** has been removed. Apparent **color** includes not only the **color** due to substances in solution (true **color**), but also that **color** due to suspended matter.

18. Coolwater aquatic life/fishery

A river or stream reach, lake, or impoundment where water temperature and other characteristics are suitable for support and propagation of both coldwater and warmwater- adapted aquatic life on a transitional basis including, but not limited to, individuals or species of green plants, **algae**, fungi, macroinvertebrates, fish (e.g., chubs, dace, trout, suckers, and walleye), shellfish, snails, frogs, turtles, salamanders, or other aquatic plants and animals.

19. Criterion Continuous Concentration (CCC)

The chronic criterion or limit for exposure to a specific pollutant. This is the limit that controls for continuous exposure scenarios and typically sets a lower limit than the CMC.

20. Criterion Maximum Concentration (CMC)

The acute criterion or limit for exposure to a specific pollutant. This is the limit that controls for maximum exposure scenarios over a short term exposure and typically sets a higher limit than the CCC. CMCs are typically time limited to indicate the length of exposure allowed at this higher concentration.

21. Cumulative

Increasing by successive additions.

22. Designated uses

Those uses set forth in the water quality standards herein.

23. Dissolved oxygen (DO)

The amount of oxygen dissolved in water or the amount of oxygen available for biochemical activity in water, commonly expressed as a concentration in milligrams per liter.

24. Domestic water supply

A **surface water of the Pueblo of Santa Ana** that may be used as potable supply after disinfection.

25. Effluent

Discharge into surface waters from other than natural sources.

26. Ephemeral stream

A stream or reach that flows briefly only in direct response to precipitation or snowmelt in the immediate locality, the channel bed of which is always above the water table in the surrounding area.

27. Epilimnion

The layer of water that overlies the thermocline of a lake and that is subject to the action of wind.

28. Escherichia coli

"***Escherichia coli***" or "*E. coli*" means a bacterial species that inhabits the intestinal tract of humans and other warm-blooded animals, the presence of which indicates the potential presence of pathogenic microorganisms capable of producing disease.

29. Eutrophication

The maturation of a body of water, involving increasing concentration of dissolved **nutrient**s and seasonal oxygen deficiency.

30. Existing uses

Those uses actually attained in a surface water body on or after November 28, 1975, whether or not they are referred to in the Pueblo of Santa Ana Water Quality Standards.

31. Fecal coliform

Gram negative, non spore-forming rod-shaped bacteria which are present in the gut or the feces of warm-blooded animals. **Fecal coliform** bacteria generally includes organisms which are capable of producing gas from lactose broth in a suitable culture medium within 24 hours at 44.5+/-0.2 °C.

32. Fishery

A balanced, diverse community of fishes controlled by the water quality, quantity, and habitat of a water body.

33. Geometric Mean

Antilog of the mean of the logs of a set of numbers. The monthly **geometric mean** is used in assessing attainment of standards when a minimum of five samples is collected in a 90-day period.

34. Indigenous

Produced, growing, or living naturally in a particular region or environment.

35. Intermittent stream

A stream or reach of a stream that flows only at certain times of the year, when receiving flow from springs, melting snow, or localized precipitation.

36. MCL

Acronym for "Maximum Contaminant Level." The maximum permissible level of a contaminant in water delivered to any user of a public water supply system under the Federal Safe Drinking Water Act. **MCL**s are enforceable standards.

37. Milligrams per liter (mg/l)

The concentration at which one milligram is contained in a volume of one liter; one milligram per liter is equivalent to one part per million (ppm) at unit density.

38. Mixing zone

A three-dimensional zone in which discharged **effluent** mixes with the receiving water and within which there is a gradation of water quality.

39. Narrative standard

A standard or criterion expressed in words rather than numerically.

40. National Pollutant Discharge Elimination Systems (NPDES)

Section 402 of the Clean Water Act. It is the Clean Water Act's primary **point source** control program through which **point source** discharges of pollution are permitted. Some activities which require **NPDES** permits are: municipal sewage treatment plants, industrial treatment plants, mines, concentrated animal feeding operations and storm water construction sites.

41. Natural background/natural condition

Characteristics that are not man-induced that are related to water quality or the environmental setting; the levels of pollutants present are from natural, as opposed to man-induced, sources.

42. Non-point source

A source of pollution that is not a discernible, confined, and discrete conveyance; a diffuse source which flows across natural or manmade surfaces, such as run-off from agricultural, construction, mining, or silvicultural activities, or from urban areas.

43. NTU

Nephelometric **Turbidity** Units; a measure of **turbidity** in water.

44. Nuisance condition

A condition involving uncontrolled growth of aquatic plants, usually caused by excessive **nutrients** in the water.

45. Nutrient

A chemical element or inorganic compound taken in by green plants and used in organic synthesis.

46. Organoleptic

Affecting or involving a sense organ (smell, taste) responsive to sensory stimuli.

47. Pathogens

Microorganisms that can cause disease in humans, animals, and plants. They may be bacteria, viruses, or parasites and are found in sewage, in runoff from animal farms or rural areas populated with domestic and/or wild animals, and in water used for swimming. Fish and shellfish contaminated by **pathogens**, or the contaminated water itself, can cause serious illnesses.

48. Perennial stream

A stream or reach of a stream that flows continuously throughout the year, the upper surface of which is generally lower than the water table of the region adjoining the stream.

49. Persistent

To continue in existence.

50. pH

The negative logarithm of the effective hydrogen-ion concentration in gram equivalents per liter; a measure of the acidity or alkalinity of a solution, increasing with increasing alkalinity and decreasing with increasing acidity.

51. Picocurie (pCi)

That quantity of radioactive material producing 2.22 nuclear transformations per minute.

52. Point source

Any discernible, confined, and discrete conveyance from which pollutants are or may be discharged into a water body; does not include return flows from irrigated agriculture.

53. Practicable

In the context of antidegradation, practicable means technologically possible, able to be put into practice, and economically viable.

54. Primary contact ceremonial use

The use of a stream, reach, lake, or impoundment for religious or traditional purposes by members of the Pueblo of Santa Ana; such use involves immersion, and intentional or incidental ingestion of water, and it requires protection of sensitive and valuable aquatic life and riparian habitat.

55. Primary contact recreational use

Recreational use of a stream, reach, lake, or impoundment involving prolonged contact and the risk of ingesting water; examples are swimming and water skiing.

56. Secondary contact recreational use

Recreational use of a stream, reach, lake, or impoundment in which contact with the water may, but need not, occur and in which the probability of ingesting water is minimal; examples are fishing and boating.

57. Segment

A water quality standards **segment**, the surface waters of which have common hydrologic characteristics or flow regulation regimes, possess common natural physical, chemical, and biological characteristics, and exhibit common reactions to external stresses, such as the discharge of pollutants.

58. Spring

Place where a concentrated discharge of ground water flows at the ground surface.

59. Statistical Threshold Value (STV)

A calculated criterion for each of the sets of criteria values, the **STV** is based on the water quality distribution observed during EPA's epidemiological studies. The **STV** approximates the 90th percentile of the water quality distribution and is intended to be a value that should not be exceeded by more than 10% of the samples used to calculate the **GM**. When less than 5 samples are collected in a 90-day period, no single sample shall exceed **STV**.

60. Surface waters of the Pueblo of Santa Ana

A surface water of the Pueblo of Santa Ana or reach of a surface water of the Pueblo of Santa Ana, for which the Tribal Council has adopted a segment description and has designated a use or uses and applicable water quality criteria. This includes all surface waters situated wholly or partly within or bordering upon the Pueblo of Santa Ana, including lakes (both manmade and natural), rivers, streams (including **intermittent** and **ephemeral stream**s), mudflats, sandflats, **wetlands**, sloughs, prairie potholes, wet meadows, playa lakes, reservoirs, or natural ponds. **Surface waters of the Pueblo of Santa Ana** also include all tributaries of such waters, including adjacent **wetlands**, any manmade bodies of water that were originally created in **surface waters of the Pueblo of Santa Ana** or resulted in the impoundment of **surface waters of the Pueblo of Santa Ana**, and any "waters of the United States" as defined under the Clean Water Act. These "waters of the United States" will be protected by the Pueblo of Santa Ana in a manner consistent with the Pueblo of Santa Ana Water Quality Standards and Tribal

authority. Also called “Surface Waters of the Pueblo” in the text.

61. Thermal stratification

Horizontal layers of different densities produced in a lake caused by temperature.

62. Toxicity

State or degree of being toxic or poisonous; lethal or sub-lethal adverse effects on representative sensitive organisms, due to exposure to toxic materials.

63. Turbidity

A measure of the amount of suspended material, particles, or sediment, which has the potential for adverse impacts on aquatic biota.

64. Use-attainability analysis

A structured scientific assessment of the factors affecting attainment of a use for a body of water, which assessment may include physical, chemical, biological, and economic factors, such as those referred to in 40 C.F.R. Section 131.10(g), and guidance for which may be found in U.S. Environmental Protection Agency, *Technical Support Manual: Water body Surveys and Assessments for Conducting Use-Attainability Analysis (Volume l--Streams; Volume 2--Estuarine Systems; Volume 3--Lake Systems).*

65. Warmwater aquatic life/fishery

A river or stream reach, lake, or impoundment where water temperature and other characteristics are suitable for support and propagation of warmwater-adapted aquatic life including, but not limited to, individuals or species of green plants, **algae**, fungi, macroinvertebrates, fish (e.g., cyprinids, minnows, carpsuckers, large-mouth bass, spotted bass, small-mouth bass, white bass, crappie, bluegill, channel catfish, bullhead catfish, live-bearers), shellfish, snails, frogs, turtles, salamanders, or other aquatic plants and animals.

66. Water contaminant

Any substance which alters the physical, chemical, or biological qualities of water.

67. Water Resources of the Pueblo

The term “Water Resources of the Pueblo” includes all surface waters of the Pueblo and any other water for which the Pueblo has either a water right or a responsibility to protect the water. This term includes groundwater, stormwater, and other waters not specifically covered by the Clean Water Act.

EPA took no action on the underlined portion of the definition for "Water Resources of the Pueblo" in Section VII, as it applies to waters beyond the scope covered under the CWA. The underlined text is not effective for CWA purposes.

68. Wetlands

Those areas inundated or saturated by surface water and/or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, vegetation typically adapted for life in saturated soil conditions. Constructed **wetlands** used for wastewater treatment purposes are not included in this definition.

69. Wildlife habitat

A **surface water of the Pueblo of Santa Ana** including **wetlands** that is suitable to support and propagate animal and plant species. **Wildlife habitat** surface waters are used for drinking water supply, food supply, habitation, and propagation by plants and animals and is not pathogenic to humans, domesticated livestock, and plants.

70. Zone of passage

The portion of the receiving water outside the **mixing zone** where water quality is the same as that of the receiving water.

Appendix A:Water Quality Criteria for Toxic Substances

As new criteria documents for toxic substances are published by EPA, these will become incorporated into and made a part of Subsection O, TOXIC SUBSTANCES and the associated tables A1: "Fresh Water Aquatic Criteria" and A2: "Human Health Criteria," during triennial review, and the numeric criteria established by EPA shall equally apply. Numeric criteria for carcinogens will reflect a risk level of one in a million.

For specific **segments** where the criteria in Tables A1 and A2 may need to be recalculated using appropriate species or water quality factors, the Pueblo of Santa Ana may, after public participation and EPA approval, adopt site-specific criterion modifications. Since pesticides and PCB's can accumulate in bottom sediments and tissues of aquatic organisms, sediment and tissue analysis shall routinely be used to complement water analysis. Fish tissue levels in excess of **FDA Action Limits** shall require investigation.

Table A1: Fresh Water Aquatic Criteria

Substance[b]	**CASRN**	**Chronic Toxicity[c] (µg/l)**	**Acute Toxicity[c] (µg/l)**
Acrolein	107-02-8	3.0	3.0
Aldrin	309-00-2	--	3.0
Aluminum[a]	7429-90-5	750	750
Ammonia[d]	7664-41-7[e]	0.21[f,g]	0.81[f]
Arsenic[a]	7440-38-2	150	340
Beryllium[a]	7440-41-7	5.3	130
Cadmium[a]	7440-43-9	e(0.7977[ln(hd)]-3.909)(CF)	e(0.9789[ln(hd)]-3.866)(CF)
Carbaryl	63-25-2	2.1	2.1
Chlordane	57-74-9	0.0043	2.4
Chlorine residual	7782-50-5	11	19
Chlorpyrifos	2921-88-2	0.041	0.083
Chromium (III)[a]	16065-83-1	e(0.8190[ln(hd)]+0.6848)(0.860)	e(0.8190[ln(hd)]+ 3.7256)(0.316)
Chromium (VI)[a]	18540-29-9	10.58	15.71
Copper[a]	7440-50-8	e(0.8545[ln(hd)]-1.702)(0.960)	e(0.9422[ln(hd)]- 1.700)(0.960)
Cyanide	57-12-5	5.2	22
4,4'-DDT	50-29-3	0.001	1.1
Demeton	8065-48-3	0.1	--
Diazinon	333-41-5	0.17	0.17
Dieldrin	60-57-1	0.056	0.24
Endosulfan, alpha	959-98-8	0.056	0.22
Endosulfan, beta	33213-65-9	0.056	0.22

Table A1: Fresh Water Aquatic Criteria (Continued)

Substance[b]	CASRN	Chronic Toxicity[c] (µg/l)	Acute Toxicity[c] (µg/l)
Endrin	72-20-8	0.036	0.086
Guthion	86-50-0	0.01	--
Heptachlor	76-44-8	0.0038	0.52
Heptachlor epoxide	1024-57-3	0.0038	0.52
gamma-BHC (Lindane)	58-89-9	--	0.95
Iron [a]	7439-89-6	1000	--
Lead[a]	7439-92-1	e(1.273[ln(hd)]-4.705) (CF)	e(1.273[ln(hd)]-1.460) (CF)
Malathion	121-75-5	0.1	--
Mercury	7439-97-6	0.012	2.4
Methoxychlor	72-43-5	0.03	--
Mirex	2385-85-5	0.001	--
Nickel[a]	7440-02-0	e(0.8460[ln(hd)]+0.0584)(0.997)	e(0.8460[ln(hd)]+2.255)(0.998)
Nonylphenol	25154-52-3	6.6	28
Parathion	56-38-2	0.013	0.065
Polychlorinated Biphenyls	xx-xx-x	0.014	--
Pentachlorophenol[h]	87-86-5	e(1.005(pH)-5.134)[h]	e(1.005 (pH)-4.869)[h]
Selenium	7782-49-2	2	20
Silver[a]	7440-22-4	--	e(1.72[ln(hd)]-6.59)(0.85)
Sulfide-Hydrogen Sulfide	7783-06-4	2	--
Toxaphene	8001-35-2	0.0002	0.73
Tributyltin (TBT)	-	0.072	0.46
Zinc[a]	7440-66-6	e(0.8473[ln(hd)]+0.884)(0.986)	e(0.8473[ln(hd)]+0.884)(0.978)

-- = no criterion exists
hd = hardness
ln = natural log of number
CF = Conversion Factor (for hardness dependent metals)
For Cadmium: Acute CF is 1.136672-[ln(hd)(0.041838)]
Chronic CF is 1.101672-[ln(hd)(0.041838)]
For Lead: Acute CF is 1.46203-[ln(hd)(0.145712)]
Chronic CF is 1.46203-[ln(hd)(0.145712)]
a = Value based on using a dissolved method.
b = Total recoverable portion, unless indicated
c = Chronic and acute toxicity averaging periods and exceedances are as specified by the U.S. Environmental Protection Agency in *Quality Criteria for Water*, 1986 (EPA 440/5-86-001).

d = Ammonia criteria are based on *Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater 2013*, 2013 (EPA 822-R-13-001). Values listed in this table are for pH 8.6 at 25°C. Specific values for other pH and temperature conditions are listed in Appendix B (Table B1 for CMC and Table B2 for CCC). These ammonia criteria are not to be exceeded more than once in three years on average.

e = The CAS number given is for ammonia. Ammonia reacts in water to form ammonium hydroxide. This reaction is temperature and pH dependent and both ammonia and ammonium hydroxide are typically present in equilibrium in aqueous solutions of ammonia. Therefore aqueous ammonia is given a different CAS number, 1336-21-6.

f = Units for ammonia criteria are mg Total Ammonia Nitrogen (TAN)/L.

g = The chronic criterion is expressed as a Criterion Continuous Concentration (CCC). The ammonia concentration is not to exceed 2.5 times the CCC as a 4-day average within 30-days, i.e., 0.53 mg TAN/L at pH 8.6 and 25°C, more than once in three years on average.

h = Pentachlorophenol criteria are based on pH. For the allowable pH range (6.0 to 9.0), the pentachlorophenol criteria for chronic toxicity range from 2.4 to 50 and for acute toxicity range from 3.2 to 65.

mg/l = milligrams/liter

µg/l = micrograms/liter

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Table A2: Human Health Criteria*

Substance[b]	CASRN	Fish Consumption and Other[c] (Not to Exceed) (µg/l)	Water Consumption(µg/l)
Acenaphthene	83-32-9	20[i]	--
Acrolein	107-02-8	400	--
Acrylonitrile	107-13-1	7	--
Aldrin	309-00-2	0.00000077	--
Antimony[a]	7440-36-0	--	6[e]
Arsenic[a]	7440-38-2	3.6[h]	10[e, h]
Barium [a]	7440-39-3	--	2000[e]
Benzene	71-43-2	16	5[e]
Benzidine	92-87-5	0.011	--
Beryllium[a]	7440-41-7	--	4[e]
Butyl Benzyl Phthalate	85-68-7	0.10	--
Cadmium[a]	7440-43-9	--	5[e]
Carbon Tetrachloride	56-23-5	5	--
Chlordane	57-74-9	0.00032	--
Chlorobenzene	108-90-7	20[i]	--
2-Chloronapthalene	91-58-7	1000	--
Bis(2-Chloroethyl) Ether	111-44-4	2.2	--
Bis(2-Chloroisopropyl) Ether	108-60-1	4000	--
Bis(Chloromethyl) Ether	542-88-1	0.017	--
2-Chlorophenol	95-57-8	0.10[i]	--
3-Chlorophenol	108-43-0	0.10[i]	--
4-Chlorophenol	106-48-9	0.10[i]	--
2-Methyl-4-Chlorophenol	1570-64-5	1800[i]	--
3-Methyl-4-Chlorophenol	59-50-7	2000	--
3-Methyl-6-Chlorophenol	615-74-7	20[i]	--
Chromium (III)[a]	16065-83-1	--	100[e]
Chromium (VI)[a]	18540-29-9	--	100[e]
Copper[a]	7440-50-8	1000[i]	--
Cyanide	57-12-5	400	--
4,4'-DDT	50-29-3	0.00003	--

Table A2: Human Health Criteria* (Continued)

Substance[b]	CASRN	Fish Consumption and Other[c] (Not to Exceed) (µg/l)	Water Consumption(µg/l)
4,4'-DDE	72-55-9	0.000018	--
4,4'-DDD	72-54-8	0.00012	--
Di-n-Butyl Phthalate	84-74-2	30	--
1,2-Dichlorobenzene	95-50-1	3000	600[e]
1,3-Dichlorobenzene	541-73-1	10	--
1,4-Dichlorobenzene	106-46-7	900	75[e]
3,3'-Dichlorobenzedine	91-94-1	0.15	--
1,2'-Dichloroethane	107-06-2	650	5[e]
1,1-Dichloroethylene	75-35-4	20000	7[e]
1,2-Trans-Dichloroethylene	156-60-5	4000	100[e]
2,3-Dichlorophenol	576-24-9	0.04[i]	--
2,4-Dichlorophenol	120-83-2	0.3[i]	--
2,5-Dichlorophenol	583-78-8	0.5[i]	--
2,6-Dichlorophenol	87-65-0	0.2[i]	--
3,4-Dichlorophenol	95-77-2	0.3[i]	--
2,4-Dichlorophenoxy-acetic acid (2,4-D)	94-75-7	12000	70[e]
1,2-Dichloropropane	78-87-5	31	5[e]
1,3-Dichloropropene	542-75-6	12	--
Dieldrin	60-57-1	0.0000012	--
Diethyl phthalate	84-66-2	600	--
2,4 Dimethyl phenol	105-67-9	400[i]	--
Dimethyl phthalate	131-11-3	2000	--
2,4-Dinitrotoluene	121-14-2	1.7	--
Dinitrophenols	25550-58-7	1000	--
2,4-Dinitrophenol	51-28-5	300	--
2-Methyl-4,6-Dinitrophenol	534-52-1	30	--
Dioxin (2,3,7,8-TCDD)	1746-01-6	0.0000000051	--
1,2-Diphenylhydrazine	122-66-7	0.20	--
Bis 2-Ethylhexylphthalate	117-81-7	0.37	--
Endosulfan, alpha	959-98-8	30	--
Endosulfan, beta	33213-65-9	40	--

Table A2: Human Health Criteria* (Continued)

Substance[b]	**CASRN**	**Fish Consumption and Other[c] (Not to Exceed) (µg/l)**	**Water Consumption(µg/l)**
Endosulfan Sulfate	1031-07-8	40	--
Endrin	72-20-8	0.03	--
Endrin Aldehyde	7421-93-4	1	--
Ethylbenzene	100-41-4	130	700[e]
Fluoranthene	206-44-0	20	--
Fluoride	16984-48-8	--	4000[e]
Heptachlor	76-44-8	0.0000059	--
Heptachlor epoxide	1024-57-3	0.000032	--
Hexachloroethane	67-72-1	0.1	--
Hexachlorobenzene	118-74-1	0.000079	--
Hexachlorobutadiene	87-68-3	0.01	--
Hexachlorocyclohexane (HCH) -Technical	608-73-1	0.010	
alpha-BHC	319-84-6	0.00039	--
beta-BHC	319-85-7	0.014	--
gamma-BHC (Lindane)	58-89-9	4.4	--
Hexachlorocyclopentadiene	77-47-4	1[i]	--
Isophorone	78-59-1	1800	--
Lead[a]	7439-92-1	d	--
Manganese[a]	7439-96-5	100	--
Methylmercury	22967-92-6	0.3 mg/kg in fish tissue[f]	--
Methyl Bromide	74-83-9	10000	--
Methylene Chloride	75-09-2	1000	--
Methoxychlor	72-43-5	0.02	40[e]
Napthalene	91-20-3	d	--
Nickel[a]	7440-02-0	4600	--
Nitrate	14797-55-8	--	10000[e]
Nitrobenzene	98-95-3	30[i]	--
Nitrosamines		1.24	--
Nitrosodibutylamine N	924 -16-3	0.22	--
Nitrosodiethylamine N	55-18-5	1.24	--
N-Nitrosodimethylamine	62-75-9	3.0	--

Table A2: Human Health Criteria* (Continued)

Substance[b]	CASRN	Fish Consumption and Other[c] (Not to Exceed) (µg/l)	Water Consumption(µg/l)
N-Nitrosodi-n- Propylamine	621-64 -7	0.51	--
N-Nitrosodiphenylamine	86-30-6	6.0	--
N-Nitrosopyrrolidine	930-55-2	34	--
Polychlorinated Biphenyls	1336-36-3	0.000064	--
Pentachlorobenzene	608-93-5	0.1	--
Pentachlorophenol	87-86-5	0.04	1[e]
Phenol	108-95-2	300[i]	--
Polynuclear Aromatic Hydrocarbons (PAH's)		--	--
Anthracene	120-12-7	400	--
Benzo(a)Anthracene	56-55-3	0.0013	--
Benzo(a)Pyrene	50-32-8	0.00013	--
Benzo(b)Fluoranthene	205-99-2	0.0013	--
Benzo(ghi)Perylene	191-24-2	d	--
Benzo(k)Fluoranthene	207-08-9	0.013	--
4-Bromophenyl Phenyl Ether	101-55-3	d --	-- --
Chysene	218-01-9	0.13	--
Dibenzo(a,h)Anthracene	53-70-3	0.00013	--
Fluorene	86-73-7	70	--
Indeno 1,2,3-cd Pyrene	193-39-5	0.0013	--
Phenanthrene	85-01-8	d	--
Pyrene	129-00-0	30	--
Selenium	7782-49-2	4200	--
Tetrachlorobenzene 1,2,4,5	95-94-3	0.03	--
1,1,2,2-Tetrachloroethane	79-34-5	3	--
Tetrachloroethylene	127-18-4	29	--
2,3,4,6-Tetrachlorophenol	58-90-2	1.0[i]	--
Thallium [a]	7440-28-0	0.47	--
Toluene	108-88-3	520	1000[e]
Toxaphene	8001-35-2	0.00071	--
1,2,4 Trichlorobenzene	120-82-1	0.076	--
1,1,1-Trichloroethane	71-55-6	200000	200[e]
1,1,2-Trichloroethane	79-00-5	8.9	5[e]
Trichloroethylene	79-01-6	7	5[e]

Table A2: Human Health Criteria* (Continued)

Substance[b]	CASRN	Fish Consumption and Other[c] (Not to Exceed) (µg/l)	Water Consumption(µg/l)
2,4,5-Trichlorophenol	95-95-4	1.0[i]	--
2,4,6-Trichlorophenol	88-06-2	2.0[i]	--
2-(2,4,5-Trichlorophenoxy) Propionic acid (Silvex)	93-72-1	400	50[e]
TTHM (Sum of total Trihalomethanes)			80[e, g]
Dichlorobromomethane	75-27-4	27	--
Bromoform	75-25-2	120	--
Chloroform	67-66-3	2000	--
Chlorodibromomethane	124-48-1	21	--
Vinyl Chloride	75-01-4	1.6	2[e]
Zinc[a]	7440-66-6	5000[i]	--

* The values stated as Human Health Criteria for these substances are based on the assumption that fish from the surface waters covered by the Pueblo of Santa Ana Water Quality Standards are consumed, but water from these surface waters is not regularly ingested. A risk 10^{-6} is assumed for carcinogens. Where no criterion exists based on fish consumption, MCLs and background conditions are used as the basis of the water quality standard of protection.

-- = no criterion exists

a = Value based on using a dissolved method.

b = Total recoverable portion, unless indicated

c = unless otherwise noted, the value based on current national recommended water quality criteria with respect to human health for the consumption of fish and other aquatic organisms. These values can be found on http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm.

d = EPA has not calculated human health criterion for this contaminant. However, permit authorities should address this contaminant in NPDES permit actions using the Pueblo of Santa Ana's narrative criteria for toxics.

e = Based on Safe Drinking Water Act Maximum Contaminant Levels (MCLs).

f = Concentrations of mercury from all sources shall not result in methylmercury concentrations in fish tissue that exceed 0.3 mg/kg. This criterion is based on a fish consumption rate of 17.5 g/day.

g = This value cannot be exceeded by itself, or as part of Total Trihalomethanes that include:
Bromodichloromethane (CASN 75-27-4)
Dibromochloromethane(CASN 124-48-1)
Tribromomethane [Bromoform (CASN 75-25-2)]
Trichloromethane [Chloroform (CASN 67-66-3)]

h = Based on background conditions of the Rio Grande the Fish Consumption and Other limit for Arsenic is 3.6 µg/L. Levels in the Rio Jemez commonly exceed this value and background is estimated to be 160 µg/L. The criterion for water consumption of 10 µg/L will be applied to discharges into the waters of the Rio Jemez watershed.

i = Value based on organoleptic effects criteria (e.g., taste and odor) in the current national recommended water quality criteria (see http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm).
mg/l= milligrams/liter
µg/l = micrograms/liter

Criteria for Ammonia

The Pueblo of Santa Ana adopts the EPA recommended ammonia acute criterion magnitude (or Criterion Maximum Concentration [CMC]) of 0.81 mg Total Ammonia Nitrogen/Liter (TAN/L) and the chronic criterion magnitude (or Criterion Continuous Concentration [CCC]) of 0.21 mg TAN/L at pH 8.6 and 25°C, with the stipulation that the chronic criterion cannot exceed 2.0 mg TAN/L as a 4-day average. All criteria magnitudes are recommended not to be exceeded more than once in three years on average. The ammonia criteria are pH and temperature dependent and the values selected for the base criteria at pH = 8.6 and T = 25°C represent the most stringent criteria that can be expected on an annual basis based on available water quality data. Any values exceeding the values listed below must be compared to the criteria in Tables B1 and B2 to determine if the applicable criterion at the ambient pH and temperature was exceeded. If the pH > 8.6 or the temperature > 25°C, then all ammonia values need to be checked against the criteria in Tables B1 and B2 The selected values are highlighted in bold in Tables B1 and B2 to determine if the applicable criterion at the ambient pH and temperature was exceeded..

Pueblo of Santa Ana Final Aquatic Life Criteria for Ammonia (Magnitude, Frequency, and Duration) (mg TAN/L) pH 8.6, T=25°C	
Acute (CMC) (1-hour average)	0.81
Chronic (CCC) (30-day rolling average)	0.21*
*Not to exceed 2.5 times the CCC as a 4-day average within the 30-days, i.e. 0.53 mg TAN/L at pH 8.6 and 25°C, more than once in three years on average.	
Criteria frequency: Not to be exceeded more than once in three years on average.	

The available data for ammonia indicate that, except possibly where an unusually sensitive species is important at a site, freshwater aquatic life will be protected if these criteria are met. Table B1 provides the temperature and pH-dependent values of the CMC (acute criterion magnitude) and Table B2 provides the temperature and pH-dependent values of the CCC (chronic criterion magnitude) based on the EPA recommended criterion calculations derived in *Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater 2013*, 2013 (EPA 822-R-13-001).

Appendix B: Ammonia Criteria Temperature and **pH**-Dependent Values for Chronic and Acute Criteria

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Appendix B: Ammonia Criteria Temperature and **pH**-Dependent Values for Chronic and Acute Criteria

Table B1. Temperature and pH-Dependent Values of the CMC (Acute Criterion Magnitude)

	Temperature (°C)																				
pH	0-10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6.5	51	48	44	41	37	34	32	29	27	25	23	21	19	18	16	15	14	13	12	11	9.9
6.6	49	46	42	39	36	33	30	28	26	24	22	20	18	17	16	14	13	12	11	10	9.5
6.7	46	44	40	37	34	31	29	27	24	22	21	19	18	16	15	14	13	12	11	9.8	9.0
6.8	44	41	38	35	32	30	27	25	23	21	20	18	17	15	14	13	12	11	10	9.2	8.5
6.9	41	38	35	32	30	28	25	23	21	20	18	17	15	14	13	12	11	10	9.4	8.6	7.9
7.0	38	35	33	30	28	25	23	21	20	18	17	15	14	13	12	11	10	9.4	8.6	7.9	7.3
7.1	34	32	30	27	25	23	21	20	18	17	15	14	13	12	11	10	9.3	8.5	7.9	7.2	6.7
7.2	31	29	27	25	23	21	19	18	16	15	14	13	12	11	9.8	9.1	8.3	7.7	7.1	6.5	6.0
7.3	27	26	24	22	20	18	17	16	14	13	12	11	10	9.5	8.7	8.0	7.4	6.8	6.3	5.8	5.3
7.4	24	22	21	19	18	16	15	14	13	12	11	9.8	9.0	8.3	7.7	7.0	6.5	6.0	5.5	5.1	4.7
7.5	21	19	18	17	15	14	13	12	11	10	9.2	8.5	7.8	7.2	6.6	6.1	5.6	5.2	4.8	4.4	4.0
7.6	18	17	15	14	13	12	11	10	9.3	8.6	7.9	7.3	6.7	6.2	5.7	5.2	4.8	4.4	4.1	3.8	3.5
7.7	15	14	13	12	11	10	9.3	8.6	7.9	7.3	6.7	6.2	5.7	5.2	4.8	4.4	4.1	3.8	3.5	3.2	2.9
7.8	13	12	11	10	9.3	8.5	7.9	7.2	6.7	6.1	5.6	5.2	4.8	4.4	4.0	3.7	3.4	3.2	2.9	2.7	2.5
7.9	11	9.9	9.1	8.4	7.7	7.1	6.6	6.0	5.6	5.1	4.7	4.3	4.0	3.7	3.4	3.1	2.9	2.6	2.4	2.2	2.1
8.0	8.8	8.2	7.6	7.0	6.4	5.9	5.4	5.0	4.6	4.2	3.9	3.6	3.3	3.0	2.8	2.6	2.4	2.2	2.0	1.9	1.7
8.1	7.2	6.8	6.3	5.8	5.3	4.9	4.5	4.1	3.8	3.5	3.2	3.0	2.7	2.5	2.3	2.1	2.0	1.8	1.7	1.5	1.4
8.2	6.0	5.6	5.2	4.8	4.4	4.0	3.7	3.4	3.1	2.9	2.7	2.4	2.3	2.1	1.9	1.8	1.6	1.5	1.4	1.3	1.2
8.3	4.9	4.6	4.3	3.9	3.6	3.3	3.1	2.8	2.6	2.4	2.2	2.0	1.9	1.7	1.6	1.4	1.3	1.2	1.1	1.0	0.96
8.4	4.1	3.8	3.5	3.2	3.0	2.7	2.5	2.3	2.1	2.0	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.0	0.93	0.86	0.79
8.5	3.3	3.1	2.9	2.7	2.4	2.3	2.1	1.9	1.8	1.6	1.5	1.4	1.3	1.2	1.1	0.98	0.90	0.83	0.77	0.71	0.65
8.6	2.8	2.6	2.4	2.2	2.0	1.9	1.7	1.6	1.5	1.3	1.2	1.1	1.0	0.96	0.88	**0.81**	0.75	0.69	0.63	0.58	0.54
8.7	2.3	2.2	2.0	1.8	1.7	1.6	1.4	1.3	1.2	1.1	1.0	0.94	0.87	0.80	0.74	0.68	0.62	0.57	0.53	0.49	0.45
8.8	1.9	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.0	0.93	0.86	0.79	0.73	0.67	0.62	0.57	0.52	0.48	0.44	0.41	0.37
8.9	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.93	0.85	0.79	0.72	0.67	0.61	0.56	0.52	0.48	0.44	0.40	0.37	0.34	0.32
9.0	1.4	1.3	1.2	1.1	1.0	0.93	0.86	0.79	0.73	0.67	0.62	0.57	0.52	0.48	0.44	0.41	0.37	0.34	0.32	0.29	0.27

Table B2. Temperature and pH-Dependent Values of the CCC (Chronic Criterion Magnitude)

	Temperature (°C)																							
pH	0-7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6.5	4.9	4.6	4.3	4.1	3.8	3.6	3.3	3.1	2.9	2.8	2.6	2.4	2.3	2.1	2.0	1.9	1.8	1.6	1.5	1.5	1.4	1.3	1.2	1.1
6.6	4.8	4.5	4.3	4.0	3.8	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.1	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.1
6.7	4.8	4.5	4.2	3.9	3.7	3.5	3.2	3.0	2.8	2.7	2.5	2.3	2.2	2.1	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1
6.8	4.6	4.4	4.1	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.3	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1
6.9	4.5	4.2	4.0	3.7	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.1	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1.0
7.0	4.4	4.1	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.3	2.2	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1	0.99
7.1	4.2	3.9	3.7	3.5	3.2	3.0	2.8	2.7	2.5	2.3	2.2	2.1	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1.0	0.95
7.2	4.0	3.7	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.1	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.1	1.0	0.96	0.90
7.3	3.8	3.5	3.3	3.1	2.9	2.7	2.6	2.4	2.2	2.1	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.1	1.0	0.97	0.91	0.85
7.4	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.1	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.1	1.0	0.96	0.90	0.85	0.79
7.5	3.2	3.0	2.8	2.7	2.5	2.3	2.2	2.1	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1.0	0.95	0.89	0.83	0.78	0.73
7.6	2.9	2.8	2.6	2.4	2.3	2.1	2.0	1.9	1.8	1.6	1.5	1.4	1.4	1.3	1.2	1.1	1.1	0.98	0.92	0.86	0.81	0.76	0.71	0.67
7.7	2.6	2.4	2.3	2.2	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1.0	0.94	0.88	0.83	0.78	0.73	0.68	0.64	0.60
7.8	2.3	2.2	2.1	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1.0	0.95	0.89	0.84	0.79	0.74	0.69	0.65	0.61	0.57	0.53
7.9	2.1	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1.0	0.95	0.89	0.84	0.79	0.74	0.69	0.65	0.61	0.57	0.53	0.50	0.47
8.0	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1.0	0.94	0.88	0.83	0.78	0.73	0.68	0.64	0.60	0.56	0.53	0.50	0.44	0.44	0.41
8.1	1.5	1.5	1.4	1.3	1.2	1.1	1.1	0.99	0.92	0.87	0.81	0.76	0.71	0.67	0.63	0.59	0.55	0.52	0.49	0.46	0.43	0.40	0.38	0.35
8.2	1.3	1.2	1.2	1.1	1.0	0.96	0.90	0.84	0.79	0.74	0.70	0.65	0.61	0.57	0.54	0.50	0.47	0.44	0.42	0.39	0.37	0.34	0.32	0.30
8.3	1.1	1.1	0.99	0.93	0.87	0.82	0.76	0.72	0.67	0.63	0.59	0.55	0.52	0.49	0.46	0.43	0.40	0.38	0.35	0.33	0.31	0.29	0.27	0.26
8.4	0.95	0.89	0.84	0.79	0.74	0.69	0.65	0.61	0.57	0.53	0.50	0.47	0.44	0.41	0.39	0.36	0.34	0.32	0.30	0.28	0.26	0.25	0.23	0.22
8.5	0.80	0.75	0.71	0.67	0.62	0.58	0.55	0.51	0.48	0.45	0.42	0.40	0.37	0.35	0.33	0.31	0.29	0.27	0.25	0.24	0.22	0.21	0.20	0.18
8.6	0.68	0.64	0.60	0.56	0.53	0.49	0.46	0.43	0.41	0.38	0.36	0.33	0.31	0.29	0.28	0.26	0.24	0.23	**0.21**	0.20	0.19	0.18	0.16	0.15
8.7	0.57	0.54	0.51	0.47	0.44	0.42	0.39	0.37	0.34	0.32	0.30	0.28	0.27	0.25	0.23	0.22	0.21	0.19	0.18	0.17	0.16	0.15	0.14	0.13
8.8	0.49	0.46	0.43	0.40	0.38	0.35	0.33	0.31	0.29	0.27	0.26	0.24	0.23	0.21	0.20	0.19	0.17	0.16	0.15	0.14	0.13	0.13	0.12	0.11
8.9	0.42	0.39	0.37	0.34	0.32	0.30	0.28	0.27	0.25	0.23	0.22	0.21	0.19	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.10	0.09
9.0	0.36	0.34	0.32	0.30	0.28	0.26	0.24	0.23	0.21	0.20	0.19	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.11	0.10	0.09	0.09	0.08