NOTICE OF PROPOSED RULEMAKING

TITLE 18. ENVIRONMENTAL QUALITY

CHAPTER 11. DEPARTMENT OF ENVIRONMENTAL QUALITY

WATER QUALITY STANDARDS

PREAMBLE

1. Article, Part, or Section Affected (as applicable)	Rulemaking Action
R18-11-101	Amend
R18-11-107.01	Amend
R18-11-109	Amend
R18-11-114	Amend
R18-11-115	Amend
R18-11-120	Amend
R18-11-122	Amend
Appendix A	Amend
Table 1	Amend
Table 2	Amend
Table 3	Amend
Table 4	Amend
Table 5	Amend
Table 6	Amend
Table 11	Repeal
Table 11	New Table
Table 12	Repeal
Table 12	New Table
Table 13	New Table
Table 14	New Table
Table 15	New Table
Table 16	New Table
Table 17	New Table
Appendix B	Amend
Appendix C	Amend

2. Citations to the agency's statutory rulemaking authority to include the authorizing

statute (general) and the implementing statute (specific):

Authorizing statute: A.R.S. §§ 49-202(A), 49-203(A)(1), 49-221, 49-222

Implementing statute: A.R.S. §§ 49-221, 49-222

3. Citations to all related notices published in the *Register* as specified in R1-1-409(A) that pertain to the record of the proposed rule:

The Notice of Docket Opening will be published simultaneously with the Notice of Proposed Rulemaking.

4. The agency's contact person who can answer questions about the rulemaking:

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5. An agency's justification and reason why a rule should be made, amended, repealed or renumbered, to include an explanation about the rulemaking:

General Explanation of this Rulemaking:

The Arizona Department of Environmental Quality (ADEQ) proposes to amend 18 A.A.C. 11, Article 1 in order to adopt and revise water quality standards within the State of Arizona as required under Section 303(c) of the Clean Water Act (CWA). ADEQ last adopted a comprehensive revision to water quality standards in January, 2009. Minor revisions were adopted in August, 2016.

A.R.S. § 49-222 authorizes ADEQ to adopt surface water quality standards that assure water quality, if attainable, that provides for protecting the public health and welfare; to develop standards to enhance the quality of water in Arizona; and to take into consideration the use and value of water for public water supplies, the propagation of fish and wildlife, and recreational, agricultural, industrial, and other purposes, including navigation. ADEQ is required to adopt numeric surface water standards that establish numeric limits on the concentrations of each of the 126 toxic pollutants listed by EPA in 40 CFR Part 423, Appendix A under § 307 of the Clean Water Act authority. In adopting numeric water quality standards, ADEQ may consider:

1. The effect of local water quality characteristics on the toxicity of pollutants;
2. The varying sensitivities of local affected aquatic populations to these pollutants; and
3. The extent to which the natural flow of the stream is perennial, intermittent, effluent-dependent, or ephemeral.

While ADEQ may consider these site-specific factors in establishing water quality standards for ephemeral waters and effluent-dependent waters, any water quality standard adopted must be consistent with the requirements of the Clean Water Act.

Section 303(c) of the CWA requires states to, where appropriate, adopt and revise water quality standards at least once every three years. The key elements of the water quality standards program are:

1. A water quality standard is defined as consisting of the designated beneficial uses of a water body and the water quality criteria necessary to support the designated uses;
2. The criteria shall be specific numeric criteria or narrative criteria based on biological monitoring or assessment methods consistent with the Clean Water Act;
3. The following minimum beneficial uses must be considered when establishing surface water quality standards under the Clean Water Act: 1) public water supply; 2) the propagation of fish, shellfish, and wildlife; 3) recreation; 4) agricultural uses; 5) industrial uses; and 6) other purposes, including navigation;
4. The water quality standards must protect public health and welfare, enhance the quality of water, and serve the purposes of the Clean Water Act;
4. The surface water quality standards rules must be reviewed at least once every three years using a process that includes public participation; and
5. EPA must review and approve or disapprove the surface water quality standards adopted by ADEQ.

EPA requires ADEQ to specify appropriate uses to be achieved and protected in Arizona's surface waters. These ADEQ-specified designated uses include:

- domestic water source (DWS),
- fish consumption (FC),
- full body contact recreation (FBC),
- partial body contact recreation (PBC),
- aquatic and wildlife (cold water) (A&Wc) (acute and chronic),
- aquatic and wildlife (warm water) (A&Ww) (acute and chronic),
- aquatic and wildlife (effluent-dependent water) (A&Wedw) (acute and chronic),
- aquatic and wildlife (ephemeral water) (A&We) (acute only),
- agricultural irrigation (AgI), and
- agricultural livestock watering (AgL).

Individual surface waters in Arizona and their respective designated uses are listed in Appendix B of this rulemaking. Other "surface waters" in Arizona are regulated under the tributary rule, which assigns designated uses to unlisted tributaries of surface waters listed in Appendix B.

The surface water quality standards for downstream surface waters must be considered when establishing designated uses for upstream waters. ADEQ must ensure that the water quality standards that are adopted for upstream water bodies also provide for the attainment and maintenance of the water quality standards for downstream waters. *See* 40 C.F.R. § 131.10(b). This concept is also stated in A.A.C. R18-11-104(F).

ADEQ must adopt water quality criteria that are sufficient to protect water quality for the designated uses of Arizona's surface waters and include an antidegradation policy consistent with EPA requirements in 40 C.F.R. § 131.12. *See* 40 C.F.R. § 131.6. Water quality criteria, numeric criteria, and narrative criteria must be based on a sound scientific rationale and must contain sufficient parameters for constituents to protect each designated use. *See* 40 C.F.R. 131.11(a)

ADEQ has discretionary authority under 40 C.F.R. § 131.13 to include general policies that affect the application and implementation of the surface water quality standards in the rules. ADEQ has used this authority to adopt a mixing zone rule at R18-11-114, a variance rule at R18-11-122, and site specific standards in R18-11-115.

How Surface Water Quality Standards Impact Pollution Control in Arizona

Surface water quality standards are essential elements of several important surface water quality management programs including: Arizona Pollutant Discharge Elimination System (AZPDES) permitting; the § 305(b) water quality assessment and § 303(d) impaired water listing; and total maximum daily load (TMDL) programs.

AZPDES Permit Program

Surface water quality standards are used to regulate point source discharges of pollutants under the AZPDES permit program authorized under § 402 of the Clean Water Act. When technology-based permit limits required by the Clean Water Act are not sufficiently stringent to meet the applicable water quality standards, the Clean Water Act requires the development of more stringent, water quality-based effluent limits (WQBELs) in the AZPDES permit that are designed to ensure that the applicable surface water quality standards are met. *See* C.W.A. § 301(b)(1)(C); *see also* 40 C.F.R. § 125.3(a). The surface water quality standards rules play a critical role in the development of every AZPDES permit and provide the regulatory basis for the development of WQBELs which affect the levels of treatment that a discharger may be required to provide to control the discharge of pollutants to surface waters in Arizona.

Section 305(b) Water Quality Assessment and § 303(d) Impaired Water Listing

Section 305(b) of the Clean Water Act establishes an "assessment" process to develop and report information on the quality of Arizona's surface waters. ADEQ developed a program to monitor surface waters within its boundaries, and a biennial report describing the status of water quality in Arizona rivers, streams, lakes, and

reservoirs was prepared and submitted to EPA. The § 305(b) water quality assessment process is the primary means by which ADEQ evaluates whether water bodies in Arizona are meeting surface water quality standards, that progress has been made in maintaining and restoring surface water quality, and the extent of remaining water quality problems. The surface water quality standards play a central role in the § 305(b) water quality assessment process by providing the benchmarks used to assess water quality status. The surface water quality standards also provide the basis for the identification of water quality-limited or impaired waters in Arizona. Under § 303(d) of the Clean Water Act, ADEQ identifies and lists impaired waters that do not meet one or more of the surface water quality standards. The Clean Water Act requires ADEQ to develop total maximum daily load analyses (TMDLs) to restore water quality in those impaired waters. ADEQ submits the assessment report and impairment water listing in a biennial integrated § 305(b) Assessment and § 303(d) Listing Report. ADEQ's most recent EPA-approved report is the 2016 Clean Water Act Assessment, located here: https://www.azdeq.gov/sites/default/files/2016%20Clean%20Water%20Act%20Assessment.pdf.

Total Maximum Daily Load (TMDL) Program

Under § 303(d) of the Clean Water Act, ADEQ is required to develop TMDL analyses for impaired water bodies that do not meet one or more surface water quality standards. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet surface water quality standards. The TMDL allocates that amount among the point and non-point sources in the watershed that discharge the pollutant of concern. A TMDL analysis starts with the identification of the pollutant(s) of concern and the surface water quality standards that must be attained to protect designated uses. A TMDL establishes a pollutant "budget" which is implemented through other Department water quality management programs such as the AZPDES permit program and the § 319 Non-Point Source Program. The ultimate goal of a TMDL is the restoration of water quality so that an impaired water attains applicable surface water quality standards.

Other Department Water Quality Management Programs That Depend on Surface Water Quality Standards

Section 319 of the Clean Water Act requires ADEQ to identify surface waters in Arizona that, without additional controls to control non-point sources of pollution cannot be reasonably expected to attain or maintain applicable water quality standards or the goals and requirements of the Clean Water Act. Management measures and best management practices (BMPs) are the primary mechanisms in § 319 of the Act to enable achievement of surface water quality standards. ADEQ administers the Water Quality Improvement Grant program that provides financial assistance to projects that control the discharge of pollutants to surface waters from non-point sources with a goal of achieving applicable water quality standards.

Under § 401 of the Clean Water Act, ADEQ may grant, condition, or deny water quality certification for a federally permitted or licensed activity that may result in a discharge to a surface water in Arizona. Congress intended that states use the § 401 water quality certification process to ensure that no federal license or permit is issued that would violate state-adopted water quality standards. The surface water quality standards that are the subject of this rulemaking are the basis for the § 401 water quality certification process. If ADEQ grants water

quality certification for a federal license or permit, it is in effect saying that the regulated activity will not result in a violation of a surface water quality standard. ADEQ also may place conditions on § 401 certification to ensure compliance with the surface water quality standards. ADEQ may deny certification if an applicant for a federal permit or license has not demonstrated that the regulated activity will be protective of applicable water quality standards. If ADEQ denies water quality certification, the federal permitting or licensing agency is prohibited from issuing the permit or license. ADEQ conducts § 401 water quality certifications for a variety of federal programs including the § 404 dredge-and-fill permit program currently administered by the U.S. Army Corps of Engineers, permits for construction of new or expanded airport facilities regulated by the Federal Aviation Administration, and some power plants regulated by the Federal Energy Regulatory Commission (e.g., hydroelectric power plants).

Public Participation

An important element of the surface water quality standards review process is the involvement of those who may be affected by water quality standards decisions. Section 303(c) of the Clean Water Act requires that ADEQ hold at least one public hearing during the rulemaking process to consider changes to the standards. A.R.S. § 49-208 requires that ADEQ ensure adequate public participation in the development of new or revised surface water quality standards.

ADEQ invites the active involvement of citizens with an interest in surface water quality issues, the regulated community who may be affected by the state's water quality standards decisions, and federal, state, and local agencies and governments, including Indian tribes, who may have a stake in the outcome of the rulemaking process. ADEQ has engaged in a robust public participation process during this rulemaking, holding numerous workshops and public meetings to discuss water quality standards issues, including the following:

Date	*Event*
June 21, 2017	Stakeholder Meeting: Kick off Meeting for the Triennial Review of Surface Water Quality Standards rulemaking process
November 17, 2017	Outstanding Arizona Waters Workgroup Meeting #1
December 12, 2017	Outstanding Arizona Waters Workgroup Meeting #2
December 21, 2017	Outstanding Arizona Waters Workgroup Meeting #3
January 18, 2018	Outstanding Arizona Waters Workgroup Meeting #4
January 30, 2018	Outstanding Arizona Waters Workgroup Meeting #5
February 14, 2018	Outstanding Arizona Waters Workgroup Meeting #6
November 17, 2017	Appendix B Workgroup Meeting #1
December 06, 2017	Appendix B Workgroup Meeting #2
December 18, 2017	Appendix B Workgroup Meeting #3
January 10, 2018	Appendix B Workgroup Meeting #4
January 23, 2018	Appendix B Workgroup Meeting #5
November 17, 2017	Antidegradation and Effluent Dependent Waters Workgroup 2017 Triennial Review Kick-off Meeting #1
December 13, 2017	Antidegradation and Effluent Dependent Waters Workgroup 2017 Triennial

Date	*Event*
	Review Kick-off Meeting #2
December 21, 2017	Antidegradation and Effluent Dependent Waters Workgroup 2017 Triennial Review Kick-off Meeting #3
January 22, 2018	Antidegradation and Effluent Dependent Waters Workgroup 2017 Triennial Review Kick-off Meeting #4
April 30, 2018	2018 TR Public meeting in Phoenix: Appendix B; Enforcement; Mixing Zone; Site Specific Standards; Variances
May 1, 2018	2018 TR Public meeting in Phoenix: Appendix A; Nutrients
May 7, 2018	2018 TR Public meeting in Phoenix: Outstanding Arizona Waters; Effluent Dependent Waters; Antidegradation
May 10, 2018	2018 TR Public meeting in Tucson: Appendix B; Enforcement; Mixing Zone; Site Specific Standards; Variances; Appendix A; Nutrients; Outstanding Arizona Waters; Effluent Dependent Waters; Antidegradation
Intended: September 12, 2018	Stakeholder Prototype Meeting in Tucson
Intended: September 14, 2018	Stakeholder Prototype Meeting in Phoenix
TBD	Formal Public Hearing for Rulemaking

EPA Review of Arizona's Surface Water Quality Standards

ADEQ is required to submit new and revised water quality standards to the Region 9 Administrator of the EPA for review. ADEQ must submit final surface water quality standards rules to the Regional Administrator within 30 days of the date of the filing of the final rules with the Office of the Secretary of State. At that time, EPA Region 9 will review the rules to determine whether they are consistent with the requirements of the Clean Water Act and EPA's Water Quality Standards Regulation at 40 C.F.R. Part 131.

Pursuant to 40 C.F.R. §§ 131.5 & 131.6, EPA review of the surface water quality standards rules generally consists of the following determinations:

1. Whether the designated uses are consistent with the requirements of the Clean Water Act;
2. Whether Arizona's surface water quality standards that protect the designated uses are based on sound scientific rationale consistent with 40 C.F.R. § 131.11;
3. Whether Arizona's standards that do not include designated uses specified in § 101(a)(2) of the Clean Water Act are based upon appropriate technical and scientific data and analyses;
4. Whether the water quality criterion adequately maintains and protects water quality for the designated uses and whether the state has adopted antidegradation requirements consistent with 40 C.F.R. § 131.12;
5. Whether the state adopted any water quality variances and if so, whether it is consistent with 40 C.F.R. § 131.14;
6. Whether the state adopted provision authorizing the use of schedules of compliance for water quality-based effluent limits in NPDES permits is consistent with 40 C.F.R. § 131.15;

7. Whether the state followed the legal procedures were followed necessary for adopting the surface water quality standards rules; and
8. Whether the surface water quality standards rules submission meets EPA minimum requirements specified in 40 C.F.R. § 131.6.

The EPA Regional Administrator must either approve or disapprove ADEQ's standards within a set amount of time established in the Clean Water Act and implementing rules. *See* CWA § 303(c)(3) and 40 C.F.R. §131.21(a). If EPA approves (in whole or in part) ADEQ's submitted standards, the agency must do so by notifying the state within 60 days of receiving a complete submittal of the standards rules and supporting documentation. If EPA disapproves (in whole or in part) Arizona's surface water quality standards, it must do so within 90 days of receiving the complete submittal of the surface water quality standards rules.

If the Regional Administrator disapproves a water quality standard, EPA must notify ADEQ specifying (1) why the state standards are not in compliance with the Clean Water Act, and (2) the revisions ADEQ must make to its standards to assure compliance with the Clean Water Act before EPA could fully approve the standards. *See* 40 C.F.R. § 131.21. Under § 303(c)(4) of the Clean Water Act, EPA must federally promulgate water quality standards no later than 90 days of the date of the disapproval notice described above, if ADEQ does not adopt the necessary revisions as specified by EPA within that time. A state-adopted standard that EPA disapproves remains in effect until either: (1) ADEQ adopts the necessary revisions through the rulemaking process, or (2) EPA promulgates a federal water quality standard to supersede the disapproved water quality standard.

Section by Section Explanation of Changes in this Rulemaking

New or Modified Definitions [R18-11-101]

The following terms are new or modified in A.A.C. R18-11-101, and are described more fully in their most applicable section in the preamble, as indicated in the "Rule Number":

New/Modified Term	Action	Rule Subject	Rule Subject Rule Number
Complete Mixing	New Definition	Mixing Zones	R18-11-114
Critical Flow Conditions of the Discharge	New Definition	Mixing Zones	R18-11-114
Critical Flow Conditions of the Receiving Water	New Definition	Mixing Zones	R18-11-114

New/Modified Term	Action	Rule Subject	Rule Subject Rule Number
Highest Attainable Condition	New Definition	Variances	R18-11-122
Pollutant Minimization Program	New Definition	Variances	R18-11-122
Variance	New Definition	Variances	R18-11-122
Zone of Initial Dilution	New Definition	Mixing Zones	R18-11-114
Zone of Passage	Repeal	Mixing Zones	R18-11-114

ADEQ also proposes to modify the term "reference condition," which is used in A.A.C. R18-11-108.01 (Narrative Biological Criteria for Wadeable, Perennial Streams), to clarify what the Department means by "a set of ecological measurements." The reference condition is a set of physical, chemical, and other site criteria established by the director utilizing a statewide monitoring network of least disturbed stream sites. Biological assemblages collected from those reference sites then comprise the samples from which ADEQ's biocriteria standards are derived. ADEQ, *Implementation Procedures for the Narrative Biocriteria Standard* 6-7 (April 2015), *available at* http://legacy.azdeq.gov/environ/water/standards/download/draft_bio.pdf.

Antidegradation Rule Modifications [R18-11-107.01]

Federal water quality standards regulations require ADEQ to adopt a state wide antidegradation policy and to identify the methods for implementing the policy. *See* 40 C.F.R. § 131.14. Section R18-11-107.01 satisfies the federal mandate to identify methods for implementing antidegradation. This rulemaking proposes two minor clarifying adjustments to the antidegradation rule.

First, ADEQ proposes to adjust the order of required documentation for any person proposing new or expanded regulated discharges that may cause significant degradation under A.A.C. R18-11-107.01(B)(3). Under the current rule the last document required is the baseline data of the water quality upstream of the proposed discharge location. However, none of the other required analyses can be conducted without first collecting and characterizing the baseline data. Therefore ADEQ proposes to move the baseline data collection and characterization requirement from (B)(3)(c) to (B)(3)(a) and move the other two requirements downward in order as (b) and (c) respectively so that the baseline data is collected and characterized prior to the other required analyses being conducted.

Second, ADEQ proposes to clarify temporary impacts referred to in R18-11-107.01(C)(4) by adding the phrase "and are not regularly occurring." ADEQ believes this phrase provides an additional level of clarity and

assurance that impacts will not be recurring.

E. Coli Numeric Water Quality Standards Modifications [R18-11-109(A)]

This Section prescribes numeric water quality standards for bacteria, pH, temperature, suspended sediment concentration, dissolved oxygen, and nutrients.

In November 2012, EPA issued revised recreational water quality criteria for Escherichia coliform (E. Coli) *See generally*, EPA Office of Water, Recreational Water Quality Criteria [EPA 820-F-12-058] (2012), *available at* https://www.epa.gov/wqc/2012-recreational-water-quality-criteria-documents. The criteria are based upon protecting primary contact recreation using two bacterial indicators of fecal contamination. ADEQ will continue to use E. coli as the primary indicator upon which Arizona surface water quality standards are based. ADEQ proposes to revise the current single sample maximum (SSM) values for Full Body and Partial Body Contact surface water quality standards listed in A.A.C. R18-11-109(A) to the statistical threshold values (STV) of 410 cfu/100ml and 576 cfu/100ml, respectively. The STV for full body contact approximates the 90th percentile of the water quality distribution, and the STV for partial body contact approximates the 95th percentile.

Nutrient Criteria Numeric Water Quality Standards Modifications [R18-11-109(F)]

During the 2009 Triennial Review of Surface Water Quality Standards ADEQ revised the automatic applicability of nutrient standards to waters listed in 109(F)(1), (2), (3), and (5) and their tributaries. Although limiting the automatic applicability of the nutrients standards to listed "perennial" tributaries was the intent of the 2009 revision, the current narrative found in A.A.C. R18-11-109(F) itself does not align with 109(F)(1), (2), (3), or (5) in that it requires ADEQ to apply the standards to all tributaries rather than just those listed. However, ADEQ only applies nutrient standards to other unlisted tributaries if necessary to protect the water quality of the listed surface water. ADEQ intends to modify the language to reflect that flexibility and to ensure that downstream uses will also be protected, as necessary.

Mixing Zones Rule Modifications [R18-11-114]

A mixing zone is a limited area or volume of water where dilution of a discharge takes place and where numeric water quality criteria may be exceeded in a receiving surface water. The boundary of a mixing zone is the point where the discharged pollutant is completely mixed. The goal of a mixing zone is to ensure that pollutant discharges are mixed so as to prevent acute toxicity and lethality to organisms passing through the mixing zone, and to protect the biological, chemical, and physical integrity of a surface water as a whole. Mixing zones are allowed by Clean Water Act implementing regulations. See 40 C.F.R. 131.13.

To ensure prevention of acute toxicity, the requester of a mixing zone will generally propose a mixing zone boundary based on the following recommended steps according to EPA technical guidance:

1. Identify the critical flow conditions of the receiving water and discharge, in order to predict the worst case mixing scenario of the pollutants within the mixing zone.
2. Identify conservative pollutant concentration inputs (for discharge and receiving water).

3. The requester will then model the mixing of the discharged pollutants based on the critical flow conditions and concentration assumptions.

4. The model run will produce an acceptable mixing zone size, i.e. no part of the mixing zone is acutely toxic. The model will account for whether a mixing zone should or should not be allowed. For example, a model run may show that under critical conditions (worst case scenario) the receiving water will not dilute the discharge far and fast enough to avoid acute toxicity at some point in the mixing zone. In that instance, a mixing zone may not be allowed, or the facility may need to propose installation of diffusers or other methods to ensure rapid and complete mixing. *See generally* EPA, *Technical Support Document for Water Quality-based Toxics Control*, several sections, including Section 4 (1991), *available at* https://www3.epa.gov/npdes/pubs/owm0264.pdf.

Ultimately, the factors in determining whether acute toxicity is prevented are (1) duration of exposure, and (2) pollutant concentration. While it is a goal to ensure that mixing zones are not larger than necessary, the size of the mixing zone is not as important as toxicity. *Id*.

Mixing zone standards and requirements should ensure protection of all water quality standards and should also be flexible enough for practicable and scientifically defensible implementation. Currently, ADEQ mixing zone requirements have limited flexibility and practicability. ADEQ contracted PG Environmental to provide ADEQ technical expertise and advice regarding ADEQ's current mixing zone rule. PG Environmental provided ADEQ with a technical memorandum in which it identified and recommended two main areas of change to current mixing zone standards:

- Redefine critical flow conditions for discharges and receiving waters for purposes of authorizing mixing zones
- Modify the mixing zone size requirements from fixed numeric requirements to narrative functional performance standards

ADEQ intends to establish definitions for critical flow conditions for discharges and receiving waters and modify its mixing zone requirements based on recommendations from Matthew Reusswig and Dan Connelly from PG Environmental's memorandum, Arizona Mixing Zone Water Quality Standards (June 2018), conversations with PG Environmental staff, EPA's Water Quality Standards Handbook, Chapter 5 (Sept. 2014), EPA's Technical Support Document for Water Quality-based Toxics Control (1991), as well as ADEQ's expertise and training. The PG Environmental document is on file with ADEQ and is available at: http://static.azdeq.gov/wqd/tri_rev_mixing_memo.pdf.

Redefine Critical Flow Conditions

Mixing zones are sized based on calculations and modeling to account for critical flow conditions. Assigning critical conditions for discharge and receiving water flows will allow for sizing of mixing zones based on exposure risk and exceedance frequencies and the particular designated use and criteria.

Typically, critical flow conditions allow the mixing zone to be established based on the maximum average potential of pollution concentration in a mixing zone. This is estimated by taking into account discharge flow conditions, receiving water flow conditions, the pollutant at issue, and the designated use that the mixing zone is intended to protect. Hence, for acute and chronic aquatic health standard protection at critical flow conditions, discharge flows are inputted into the model calculation at their maximum average representative flow levels, and receiving waters are inputted at their lowest average representative flow conditions. The resultant calculation of mixing zone requirements approximates the lowest representative dilution rate that will allow the water body to meet water quality standards downstream and protect aquatic wildlife in the mixing zone itself. Aquatic and wildlife standards are typically much lower than human health standards to account for aquatic life's greater sensitivity to pollutants in waterbodies. Therefore, human health standards are generally calculated using operation-representative averages over a long periods of time to approximate a longer exposure rate.

Modify Mixing Zone Size from Fixed Numeric Size to Functional Narrative Standards

Currently, ADEQ has fixed numeric size limits in its mixing zone standards:

- "The length of the mixing zone shall not exceed 500 meters in a stream." R18-11-114(H)(1)
- "A mixing zone shall provide for a zone of passage of not less than 50% of the cross-sectional area of a river or stream." R18-11-114(H)(4)

In some cases, these numeric standards may limit the practicability of the mixing zone rule. For example, a mixing zone may need to be 550 meters to reach allowable and appropriate dilution levels. This distance is only 10% greater than the now required 500 meters, but the rule as currently written does not allow for such flexibility. Also, the 50% cross-sectional zone of passage requirement may not be adequate to prevent acute toxicity to aquatic life. This is because while 50% of the channel, split lengthwise, may be nontoxic, the other 50% of the length of the channel may be acutely toxic. A visual analogy of this phenomenon may be a confluence of two rivers coming together to flow side by side for a river segment, where one side is relatively clear and the other side muddy with sediment.

An approach, which ADEQ intends to implement, that furthers the practicability of a mixing zone and ensures that there are no acutely toxic areas of a mixing zone is to remove the fixed numeric mixing zone size requirements and instead:

- Ensure that the mixing zone must still prevent acute toxicity and lethality to organisms passing through it.
- Clarify that the mixing zone ends at the point that complete mixing occurs.
- Require the mixing zone to be as small as practicable, ensuring the mixing zone is no larger than necessary to produce water quality based discharge limits.
- Disallow a mixing zone size to exceed the zone of initial dilution under critical conditions, nor

extend beyond the point in a waterbody wherein complete mixing occurs, clarifying that mixing zones may only be applied in portions of a waterbody where mixing occurs at appreciable levels.

- Limit mixing zones to be issued on a pollutant-by-pollutant basis, as not all pollutants will mix and dilute in the same manner. Also, some pollutants may be more toxic in lower concentrations than others, so that appropriate mixing is ultimately important to analyze on a pollutant basis to protect designated uses.

In making these modifications, ADEQ will remove the definition for "zone of passage" as this term is no longer used and instead add a definition for "zone of initial dilution." ADEQ is also adding definitions for critical flow conditions of the discharge and of the receiving water to ensure that the regulated public understands what data is required in their analyses. ADEQ is also adding a definition for "complete mixing" to ensure that it is clear where the boundary of the mixing zone is required to be.

Other Changes to Mixing Zone Rule

ADEQ intends to repeal two statements in subsections (C) and (D), which would already be required of the agency by licensing timeframe statutes and rules.

Site Specific Standards Rule Modifications [R18-11-115(B)(5)]

State and federal laws authorize the adoption of site-specific standards that reflect local environmental conditions. The federal water quality standards at 40 CFR 131.11(b)(1)(ii) provide ADEQ with the authority to adopt water quality criteria that are "modified to reflect site-specific conditions." Similarly, A.R.S. § 49-221(C)(6) directs the Director to consider "[a]ny unique physical, biological, or chemical properties of the waters" when establishing surface water quality standards. Under A.R.S. § 49-222(C), ADEQ may consider the effect of local water quality characteristics on the toxicity of specific pollutants and the varying sensitivities of local, affected aquatic populations to pollutants when setting numeric water quality standards. This Section provides specific authority for site specific standards and identifies methods acceptable to ADEQ and EPA for their development. Site specific standards, like all surface water quality standards, must be based on a sound scientific rationale to protect the designated use. This Section prescribes technically defensible methods for site-specific standard development.

In 2016, ADEQ proposed and finalized "natural adaptive" language in its site specific standards rule at R18-11-115(B)(5). ADEQ then submitted this language to EPA for approval as a part of its Water Quality Standards Triennial Review.

However, in its action letter, EPA disapproved this "natural adaptive" language, stating that the language "is not scientifically defensible nor consistent with 40 C.F.R. § 131 and the CWA." Torres, Tomás, EPA Director, Water Division, Letter to Trevor Baggiore, ADEQ Director, *Water Quality Division Letter of Approval and Disapproval of ADEQ's 2016 Water Quality Standards* (Dec. 23, 2016). As such, ADEQ has not implemented the subsection and now proposes to repeal it.

Enforcement Rule Modifications [R18-11-120]

As far back as 1984, this enforcement rule has consistently been used as a tool to compel the regulated community to comply with the law by prescribing measures to address violations of surface water quality standards.

Currently, this rule compels compliance with A.R.S. § 49-263(a), which states:

> "A. It is unlawful to:
>
> 1. *Discharge without a permit or appropriate authority under this chapter*.
>
> 2. Fail to monitor, sample or report discharges as required by a permit issued under this chapter.
>
> 3. Violate a discharge limitation specified in a permit issued under this chapter.
>
> 4. *Violate a water quality standard*…." (emphasis added)

<u>Enforcement Rule Should Only Apply to Non-permitted Discharges</u>

The rule prescribes the minimum data collection requirements for identifying a violation of a standard for enforcement purposes. This requirement is likely confusing to permittees because water quality standard violations for permitted facilities are identified using the permit conditions as established in accordance with federal law. The current rule does not appear to contemplate AZPDES regulation at all, as it was adopted long before ADEQ obtained primacy over the National Pollutant Discharge Program (NPDES/AZPDES). The last time this rule was amended was in 2002, in ADEQ's triennial review rulemaking, just before ADEQ adopted AZPDES rules and obtained federal approval for its AZPDES program.

The fact that the rule does not contemplate a permitting program is evident in ADEQ's responses to comments in that 2002 triennial review rulemaking. EPA commented that it assumed that the rule indicated how to comply with criteria in terms of state law alone and asked for assurances that the rule would not be misinterpreted as "describing how compliance with the criteria will be determined in the Clean Water Act context." *NFRM*, 8 A.A.R. 1264, 1392 (Mar. 29, 2002). ADEQ responded in part:

> "The rule does not regulate how EPA establishes water quality-based discharge limitations in NPDES permits or how EPA enforces those permit conditions. Presumably, EPA's establishment of permit conditions and their enforcement are addressed in the federal NPDES permit program regulations." *Id*. at 1393.

AZPDES permits are conditioned according to federal law, which typically means that the permit identifies a daily maximum pollutant discharge limit and a monthly average pollutant discharge limitation. Each of these limits are calculated to ensure that the permittee does not contribute to water quality violations in any water body. Hence, it is the violation of permit conditions and limits that indicate whether ADEQ should take an enforcement action.

Therefore, this enforcement rule should not be applied to permitted facilities. However, this rule provides a

mechanism to determine the need for enforcement of suspected unpermitted discharges and ensuing violations of water quality standards, ADEQ intends to adjust to rule so that it only applies to nonpermitted discharge violations.

ADEQ intends to strike subsection (A) of this rule because it consists of ADEQ authority that is inherent in statute and is unnecessary to be repeated here. The statutes in A.R.S. Title 49, Chapter 2, Article 4 apply more directly and cleanly without repeating them in rule.

ADEQ further intends to strike subsection (D) because it is not applicable in practice. There is no instance in which a nonpermitted discharger will have an assigned compliance schedule without a permit. If a nonpermitted discharger violates a standard and intends to or continues to discharge, part of ADEQ's enforcement action would be to require the discharger to obtain an AZPDES permit.

Enforcement Rule is Not Intended for CWA Assessment Purposes

Although the rule does prescribe the minimum data collection requirements, these requirements are for enforcement purposes only. However, because this rule is located in the standards rules, it may be unclear that this rule is not intended to be used for "assessment" purposes. An "assessment" is a Clean Water Act required action whereby every two years, ADEQ assesses whether each water or segment of a water of the United States in Arizona is attaining designated uses or not. *See* C.W.A. § 305(b). Typically combined with and integrated into that assessment report is the impaired waters list. The impaired waters list consists of the waters identified in the assessment report as conclusively not attaining a water quality standard(s) in spite of full compliance by dischargers with all permit discharge limits and requirements. The list prioritizes these waters for calculation of total maximum daily load for each pollutant impairing the nonattaining water segment. *See* C.W.A. § 303(d).

For assessment and impaired water identification purposes, ADEQ must use the apropos standard rule and associated calculation method pursuant to A.A.C. Chapter 11, Article 1 for each pollutant/use, and use the credible data and data interpretation requirements and methodologies in the Impaired Waters Identification rules in A.A.C. Chapter 11, Article 6 to determine whether each water is attaining applicable standards or not. As ADEQ stated in 2002, the "impaired water rule prescribes requirements for § 303(d) listing and the minimum requirements for data that is used for water quality assessment purposes" and "ADEQ may adopt different criteria for purposes of determining compliance with water quality standards." *NFRM*, 8 A.A.R. 1264, 1391 (Mar. 29, 2002). Therefore, this enforcement rule does not relate to whether a water is attaining or not for purposes of assessment or the impaired waters list.

Variances Rule Modifications [R18-11-122]

A water quality variance is temporary water quality criteria that diverges from the designated use criteria of the receiving water, but which still maintains the highest attainable condition of that water. The highest attainable condition of the water essentially means that the receiving water quality aligns as much as possible with a designated use and is the best quality that can be achieved during the term of a variance.

A variance is time-limited, discharger or water body-specific, and pollutant-specific. A variance does not result

in any change to the underlying designated use and criteria of the receiving water. This means that any discharger to which a variance does not apply must still comply with the applicable designated use and criteria of the water.

ADEQ has had some form of a variance rule since 1996 based on EPA guidance. However, this rule has not been implementable since 2015 because in that year, EPA promulgated new and updated rules to 40 CFR Part 131. New Section 131.14 allows states to adopt water quality standards variances as defined in §131.03(o). State variances are subject to the provisions of §131.14, the public participation requirements at §131.20(b), and EPA review for approval or disapproval.

The federal rule specifically prescribes what variances are and how they may be implemented. Therefore, this proposed rule seeks to align with federal rule requirements and allowances.

Proposed Variances Rule Differences from Current Version

Some of the main differences between the current rule and the proposed version that aligns with federal law include the following:

- Variances are now a water quality standard pursuant to federal law. See 40 CFR § 131.14. In Arizona, water quality standards must be established by rule. A.R.S. § 49-221(A). Therefore, variances must be established in rule.
    - Previously, variances were granted or denied pursuant to rule, but did not have to be established specifically in rule. Rather they were approved or disapproved in a permit issuance. The current proposal contemplates the addition of future variances by rule.
- Variances may be discharger-specific or water body or waterbody segment-specific. See 40 CFR § 131.14(a)(1).
    - Previously, variances were only discharger-specific.
- Variances requirements must represent the "highest attainable condition" of a water body to which a variance applies. See 40 CFR § 131.14(a)(1)(ii).
    - "Highest attainable condition" is a new term that is not specifically defined in federal law, but represents a number of factors that have been generally considered in previous EPA guidance and the current variance rule.
- Variances may be issued for longer than five years, but for no longer than is necessary to achieve the highest attainable condition. See 40 CFR § 131.14(b)(1)(iv). However, variances issued for longer than five years must be periodically reviewed with notice and comment. Id. Although EPA will not review the reevaluation for approval or disapproval, EPA has stated that the reevaluation may inform the EPA regarding whether new or revised water quality standards are necessary. Final Rule, Water Quality Standards Regulatory Revisions, 80 Fed. Reg. 51020, 51038 (Aug. 21, 2015). ADEQ intends to establish and reevaluate variances during its Triennial Review.
    - Previously, all variances could only be issued for five years.

- EPA's 2015 rule requires additional documentation to approve a variance, which is reflected in ADEQ's proposed rule.

Definitions to Implement the New Variance Rule

ADEQ also plans to add definitions for:

- "Highest attainable condition,"
- "Pollutant Minimization Program," and
- "Variance."

These are new terms used in EPA's standards rules, terms which ADEQ intends to define for clarity purposes. The latter two terms are proposed to be defined in accordance with EPA-defined terms in 40 C.F.R. § 131.3.

Because the highest attainable condition must be met at any time throughout a variance term, variance requirements may need to be expressed as a range, somehow dependent on particular parameters to account for change over time, or multiple variances may be adopted to allow for incremental change. *See Final Rule, Water Quality Standards Regulatory Revisions*, 80 Fed. Reg. 51020, 51035 and 51037 (Aug. 21, 2015). According the federal requirements, the variance requirements applicable at initial adoption must be the least stringent applicable requirements during the term of the variance (i.e. variance requirements can only be more stringent as time goes on).

The term "highest attainable condition" does not have a federal definition, but the proposed definition is intended to align with the use of the term in the federal rule 40 C.F.R. § 131.14. Pursuant to EPA guidance in its 2015 rulemaking, "highest attainable condition" differs from EPA's term "highest attainable use" in that:

- The condition does not have to be expressed as a use, but rather as a quantifiable expression of the condition;
- The condition applies to variances from either CWA § 101(a)(2) uses or non-CWA § 101(a)(2) uses;
- The condition cannot lower currently attaining water quality in that the condition does not change the use underlying a variance.

Modifications to Numeric Water Quality Standards [Appendix A]

Appendix A lists the numeric water quality standards. The numeric water quality criteria have been revised to reflect changes in criteria derivation methodologies, revised exposure assumptions, new information, and data on human health effects or new toxicity data that support a revision of aquatic life criteria.

In this rulemaking, ADEQ proposes the following amendments to Appendix A: Table 1 is being amended for designated uses; Tables 2-6 are being amended for hardness dependent metals; No amendments are being made to Tables 7-10; New Tables 11 through 17 are being created to address new aquatic and wildlife criteria for ammonia.

Specific revisions and the reasons for making the changes are indicated in the subsequent explanations and

tables. Each table is organized by designated use, existing criteria, and adopted criteria for each parameter.

ADEQ notes that it considered but did not take action on new selenium (Se) criteria. As recently as 2016, EPA updated its selenium standards from just a water column concentration number to a three pronged hierarchical standard where three standards apply at once for the same pollutant (the new water column is superseded by fish tissue sample concentrations which is superseded by fish egg and ovary sample concentrations). See generally, EPA Office of Water, Aquatic Life Ambient Water Quality Criterion for Selenium – Freshwater, EPA 822-R-16-006 (2016). The new standard is extremely complex and implementation of it is not yet settled. In fact, EPA's implementation guidance is in draft form and in the process of finalization. ADEQ will need to understand the impact of the standard before it may be implemented. In the interim, ADEQ's water column standards are still protective of the aquatic and wildlife uses. (The current standard A&W is 2 µg/L; and under the new standard, streams would be at 3.5 µg/L and lakes would be at 1.5 µg/L.)

Designated Uses Generally and Modification to Table 1

Methodologies for Deriving Criteria for the Domestic Water Source Designated Use

Numeric criteria to maintain and protect water quality for the Domestic Water Source (DWS) designated use are either Maximum Contaminant Levels (MCLs) established by EPA under the National Primary Drinking Water Regulations or values derived using EPA methods to protect human health. Where an MCL has been established for a pollutant, the MCL has been adopted as a criterion to protect water quality for the DWS designated use. Where MCLs were not available, the criteria were derived for the DWS designated use using the following equations:

For carcinogens:

$$\frac{70 \text{ kg} * 10^{-6}}{\text{OCSF} * 2 \text{ L/day}}$$

For non-carcinogens:

$$\frac{\text{RfD} * \text{RSC} * 70 \text{ kg}}{2 \text{ L/day}}$$

In the carcinogen equation, 70 kg is the average weight of a human male in kilograms; 10^{-6} is the excess cancer risk level; OCSF is the oral cancer slope factor; and 2 L/day is the national average water consumption rate in liters per day.

In the non-carcinogen equation, RfD is the reference dose; RSC is the relative source contribution factor, 70 kg is the average weight of a human male in kilograms and 2 L/day is the national average water consumption rate in liters per day. The relative source contribution factor is a way to account for other exposure pathways to a pollutant (e.g., food, inhalation, work exposure, etc.). There is little reliable information to assess the amount of exposure to a pollutant attributable to different exposure pathways. EPA uses a default RSC factor of 20 percent when developing MCLs. This assumes that 20 percent of a person's exposure to a pollutant is estimated to be through the ingestion of water. The Department used the same default RSC factor in deriving criteria for the

DWS designated use.

Numeric criteria for the DWS designated use has been adopted using the following decision criteria:

1. MCLs, where available;
2. Where MCLs were not available, the DWS criterion was calculated using the appropriate procedure for carcinogens or non-carcinogens;
3. For carcinogens where an OCSF was not available but an RfD was available, the non-carcinogen procedure and the RfD were used to calculate a criterion;
4. For non-carcinogens, a criterion using available RfDs was used. If an RfD was not available in the Integrated Risk Information System (IRIS) but a surrogate RfD was available, such as a Minimum Risk Level (MRL) from the Agency for Toxic Substances Disease Registry (ATSDR), a criterion using the MRL as an RfD was calculated;
5. Where an MCL, OCSF, RfD or MRL was not available, a criterion for the DWS designated use was not derived.

The following table summarizes those pollutants where a change or repeal has been made to the numeric criteria for the DWS designated use.

Domestic Water Source (DWS) Modifications

Parameter	CAS NUM	Current DWS standard (µg/L)	Proposed DWS standard (µg/L)	More or less restrictive	Modified Data to Calculate Standard	Data Source
Acenaphthylene	208968	NA	420	New	RfD = 0.06	https://rais.ornl.gov/tox/profiles/acenaphthene_f_V1.html
Acrylonitrile	107131	0.06	0.006	More	MRL = 0.04 mg/Kg/day	ATSDR MRL https://www.atsdr.cdc.gov/toxprofiles/tp125.pdf
Bis(2-chloroethoxy) methane	111911	NA	21	New	RfD = 0.003mg/Kg/day	https://cfpub.epa.gov/ncea/pprtv/documents/Bis2chloroethoxymethane.pdf
Bis(chloromethyl) ether	542881	NA	0.00015	New	304 (a) criterion	304 criteria
Chloroethane	75003	NA	280	New	Based on the State of Michigan's interpretation of subchronic RfD of 0.1 mg/kg-	https://cfpub.epa.gov/ncea/pprtv/documents/Chloroethane.pdf

Parameter	CAS NUM	Current DWS standard (µg/L)	Proposed DWS standard (µg/L)	More or less restrictive	Modified Data to Calculate Standard	Data Source
					day	
Chloronaphthalene beta	91587	560	2240	Less	RfD = 0.08 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=463
Chromium III	16065831	NA	10500	New	RfD = 1.5 mg/Kg/day	https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0028_summary.pdf
Dibenz (ah) anthracene	53703	0.005	0.350	Less	Used PAH RfD surrogate (pyrene)	IRIS OCSF/RfD : benzo(a)pyrene PAH surrogate See:https://www.michigan.gov/documents/deq/deq-rrd-chem-DibenzoAHAnthraceneDatasheet_527910_7.pdf
Dibromoethane, 1,2-	106934	0.05	0.02	More	OCSF = 2 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=361
Dinitro-o-cresol, 4,6-	534521	28.0	0.6	More	RfD = 0.00008 mg/kg-day	https://cfpub.epa.gov/ncea/pprtv/documents/Dinitroocresol46.pdf
Di-n-octyl phthalate	117840	2800	70	More	RfD = 0.01 mg/Kg/day	https://cfpub.epa.gov/ncea/pprtv/documents/OctylPhthalatediN.pdf
Endrin Aldehyde	7421933	NA	2	New	Used Endrin MRL = 0.0003 mg/Kg/day	Used MRL for Endrin as surrogate https://www.atsdr.cdc.gov/toxprofiles/tp89.pdf
Guthion	86500	NA	21	New	MRL = 0.003 mg/Kg/day	MRL 0.003 ATSDR https://www.atsdr.cdc.gov/toxprofiles/tp188.pdf
Hexachloroethane	67721	2.5	0.9	More	OCSF = 0.04 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=167
Indeno (1,2,3 cd) pyrene	193395	0.05	0.4	Less	OCSF 0.1 mg/Kg/day	Used older IRIS OCSF
Nickel	7440020	140 T	210 T	Less	RfD = 0.02 mg/Kg/day	https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst

Parameter	CAS NUM	Current DWS standard (µg/L)	Proposed DWS standard (µg/L)	More or less restrictive	Modified Data to Calculate Standard	Data Source
						/0271_summary.pdf
Nitrobenzene	98953	3.5	14	Less	RfD = 0.002 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=79
Nitrosodibutylamine	924163	NA	0.006	New	OCSF = 5.4 mg/kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=37
Nitrosodiethylamine	55185	NA	0.0002	New	OCSF = 150 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=42
N-nitrosodi-n-phenylamine	86306	0.005	7.1	Less	OCSF = 0.0049 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=178
N-nitrosodi-n-propylamine	621647	7.1	0.005	More	OCSF = 7.0 mg/kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=177
N-nitrosopyrrolidine	930552	NA	0.02	New	OCSF = 2.13 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=81
Parathion	56382	NA	42	New	RfD = 0.006 mg/Kg/day	https://www.epa.gov/sites/production/files/2016-09/documents/parathion.pdf
Pentachlorobenzene	608935	NA	6	New	RfD = 0.0008 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=85
Tetrachlorobenzene, 1,2,4,5-	95943	NA	2.1	New	RfD = 0.0003 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=107
Trichlorophenol, 2,4,5-	95954	NA	700	New	RfD = 0.1 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=121

RfD = Reference Dose - An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

MRL = Minimal Risk Level - An Agency for Toxic Substances and Disease Registry (ATSDR) estimate of daily human exposure to a hazardous substance at or below which that substance is unlikely to pose a measurable risk of adverse, noncancerous effects.

304 (a) criteria - U.S. EPA - Human health ambient water quality criteria represent specific levels of chemicals or conditions in a water body that are not expected to cause adverse effects to human health.

PAH = Polycyclic Aromatic Hydrocarbon - Organic compounds containing only carbon and hydrogen—that are composed of multiple aromatic rings.

OCSF = Oral Cancer Slope Factor - An estimate of the risk of cancer associated with exposure to a carcinogenic or potentially carcinogenic substance. A slope factor is an upper bound, approximating a 95% confidence limit, on the increased cancer risk from a lifetime exposure to an agent by ingestion or inhalation.

Methodologies for Deriving Criteria for the Fish Consumption (FC) Designated Use

Numeric water quality criteria for the fish consumption (FC) designated use were derived using the following equations:

For carcinogens:

$$\frac{70 \text{ kg} * 10^{-6}}{\text{OCSF} * 17.5 \text{ grams/day} * \text{BCF}}$$

For non-carcinogens:

$$\frac{\text{RfD} * \text{RSC} * 70 \text{ kg}}{17.5 \text{ grams/day} * \text{BCF}}$$

In the carcinogen equation, 70 kg is the average weight of a human male in kilograms; 10^{-6} is the excess cancer risk level; OCSF is the oral cancer slope factor, 17.5 grams /day is the national average fish consumption rate, and BCF is a bioconcentration factor.

In the non-carcinogen equation, RfD is the reference dose, RSC is the relative source contribution factor, 70 kg is the average weight of a human male in kilograms, 17.5 grams/day is the national average fish consumption rate, and BCF is the bioconcentration factor.

The following decision criterion is used to determine the numeric criteria for fish consumption designated use:

1. For carcinogens where an OCSF was available, a criterion was calculated using the procedure for carcinogens;

2. For carcinogens where an OCSF was not available but an RfD was available, the non-carcinogen procedure was used and a criterion was calculated for the carcinogen using the RfD or an RfD surrogate;

3. For non-carcinogens, a criterion was calculated using available RfD. If an RfD was not available in the Integrated Risk Information System (IRIS) but a surrogate RfD was available, such as a Minimum Risk Level (MRL) from the Agency for Toxic Substances Disease Registry (ATSDR), a

criterion was calculated for the non-carcinogen using the MRL;

4. Where an OCSF, RfD, or MRL was not available, a criterion was not derived for the fish consumption designated use. If the Department did not have a bioconcentration factor for a pollutant, a FC criterion was not calculated.

Fish Consumption (FC) Modifications

Parameter	CAS Num	Current FC standard (µg/L)	Proposed FC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Change data
Benzene	71432	140	114	More	OCSF = 0.035 mg/Kg/day	https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0276_summary.pdf
Benzo (a) pyrene	50328	0.02	0.1	Less	OCSF = 7.3 mg/Kg/day	IRIS OCSF/RfD : benzo(a)pyrene PAH surrogate
Cadmium	7440439	84 T	6 T	More	RfD = 0.0005 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=141
Carbon tetrachloride	56235	2	3	Less	OCSF = 0.07 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=20
Chloroform	67663	470	2133	Less	RfD/OCSF = 0.01 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=25
Chloronaphthalene beta	91587	317	1267	Less	RfD = 0.08 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=463
Chlorpyrifos	2921882		1.0	New	BCF = 2500	http://pmep.cce.cornell.edu/profiles/extoxnet/carbaryl-dicrotophos/chlorpyrifos-ext.html
Cyanide (as free cyanide)	57125	16,000 T	504 T	More	RfD = 0.00063 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=31
DDT abd break down products	72548	0.0002	0.0003	Less	OCSF = 0.34 mg/Kg/day	OCSF/RfD from DDT
Dichloromethane	75092	593	2222	Less	OCSF = 0.002 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=70
Dinitro o cresol 4,6	534521	582	12	More	RfD = 0.00008 mg/kg-day	https://www.epa.gov/sites/production/files/2015-10/documents/final-2-methyl-4-6-dinitrophenol.pdf

Parameter	CAS Num	Current FC standard (µg/L)	Proposed FC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Change data
Dinoseb	88857		12	New	BCF = 68	https://books.google.com/books?id=0yPaA9yiKYwC&pg=PA299&lpg=PA299&dq=Dinoseb+BCF&source=bl&ots=b7VQM1gHrU&sig=bfdC4RXvAF7m9G0NEy9I_KsVuBs&hl=en&sa=X&ved=0ahUKEwjP76jQrezZAhVozFQKHYn5CekQ6AEIRjAC#v=onepage&q=Dinoseb%20BCF&f=false
Diquat	85007		176	New	BCF = 10	https://pubchem.ncbi.nlm.nih.gov/compound/diquat#section=Top
Endothall	145733		16000	New	BCF = 10	https://pubchem.ncbi.nlm.nih.gov/compound/endothall
Endrin Aldehyde	7421933		0.06	New	Used Endrin MRL = 0.0003 mg/Kg/day	Used values for Endrin
Guthion	86500		92	New	MRL = 0.003 mg/Kg/day	MRL 0.003 ATSDR https://www.atsdr.cdc.gov/toxprofiles/tp188.pdf
Hexochlorocyclohexane gamma	58999	1.8	5	Less	RfD = 0.0003 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=65
Hexachlorocyclopentadiene	77474	580	74	More	RfD = 0.006 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=59
Hexachloroethane	67721	3.3	1	More	OCSF = 0.04 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=167
Indeno (1,2,3cd) pyrene	193395	0.5	1	Less	OCSF 0.1 mg/Kg/day	Used older IRIS OCSF
Malathion	121755		103	New	BCF = 155	https://oehha.ca.gov/media/downloads/crnr/apenh.pdf

Parameter	CAS Num	Current FC standard (µg/L)	Proposed FC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Change data
Mirex	2385855		0.0002	New	BCF = 1200, OCSF = 18 mg/Kg/day	https://oehha.ca.gov/chemicals/mirex Changed OCSF and BCFhttps://books.google.com/books?id=ibJKf8Gqi5gC&pg=PA208&lpg=PA208&dq=Mirex+bcf&source=bl&ots=j-SHf82Xs3&sig=JCFi4W60MBVk03KeQgiMdxWvFig&hl=en&sa=X&ved=0ahUKEwjSrKe8tOzZAhUEzWMKHXPWC2EQ6AEIPzAC#v=onepage&q=Mirex%20bcf&f=false
Nickel	7440020	4,600 T	511 T	More	RfD = 0.02 mg/Kg/day	Kept Older RfD
Nitrobenzene	98953	138	554	Less	RfD = 0.002 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=79
Nitrosodibutylamine	924163		0.2	New	OCSF = 5.4 mg/kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=37
Nitrosodiethylamine	55185		0.1	New	OCSF = 150 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=42
Nitrosopyrrolidine	930552		34	New	OCSF = 2.13 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=81
Parathion	56382		16	New	RfD = 0.006 mg/Kg/day	https://www.epa.gov/sites/production/files/2016-09/documents/parathion.pdf
Pentachlorophenol	87865	1,000	111	More	OCSF = 0.4 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=86
Permethrin	52645531		77	New	BCF = 520	New BCF https://pubchem.ncbi.nlm.nih.gov/compound/Permethrin#section=Environmental-Fate
Picloram	26952205	2,710	1806	More	RfD = 0.07	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=185
Tetrachlorodibenzopdioxin 2,3,7,8	1746016	5.00E-09	0.0000001	Less	RfD = 0.0000000007 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=1024

Parameter	CAS Num	Current FC standard (µg/L)	Proposed FC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Change data
Tetrachloroethane 1,1,2,2	79345	4	32000	Less	OCSF = 0.2 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=193
Tetrachloroethylene	127184	261	62	More	OCSF = 0.0021 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=106
Thallium	7440280	7.2 T	0.07 T	More	RfD = 0.00001 mg/Kg/day	https://cfpub.epa.gov/ncea/pprtv/documents/ThalliumCarbonate.pdf
Toluene	108883	201,000	11963	More	RfD = 0.08 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=118
Tributyltin	688733		0.08	New	RfD = 0.0003 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=349
Trichloroethane 1,1,1	71556	428,571	285714	More	RfD = 2	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=197
Trichloroethylene	79016	29	8	More	OCSF = 0.046 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=199

RfD = Reference Dose - An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

MRL = Minimal Risk Level - An Agency for Toxic Substances and Disease Registry (ATSDR) estimate of daily human exposure to a hazardous substance at or below which that substance is unlikely to pose a measurable risk of adverse, noncancerous effects.

304 (a) criteria - U.S. EPA - Human health ambient water quality criteria represent specific levels of chemicals or conditions in a water body that are not expected to cause adverse effects to human health.

PAH = Polycyclic Aromatic Hydrocarbon - Organic compounds containing only carbon and hydrogen—that are composed of multiple aromatic rings.

OCSF = Oral Cancer Slope Factor - An estimate of the risk of cancer associated with exposure to a carcinogenic or potentially carcinogenic substance. A slope factor is an upper bound, approximating a 95% confidence limit, on the increased cancer risk from a lifetime exposure to an agent by ingestion or inhalation.

Cancelled/banned pesticide - Registration cancelled by EPA. Essentially banned.

Limited/controlled use chemical. Low resaonable potential for discharge - Chemicals of limited use that are usually employed in restricted to controlled industrial settings and are not likely to enter the waste stream.

Methodologies for Deriving Criteria for the Full Body Contact Designated Use

The numeric water quality criteria for the full body contact (FBC) designated use was derived using the following equations:

For carcinogens:

$$\frac{70\ kg * 10^{-6}}{OCSF * 15\ ml/day}$$

For non-carcinogens:

$$\frac{RfD * RSC * 70\ kg}{15\ ml/day}$$

In the carcinogen equation, 70 kg is the average weight of a human male in kilograms; 10^{-6} is the excess cancer risk level; OCSF is the oral cancer slope factor, and 15 ml/day is the incidental water ingestion rate in milliliters per day.

In the non-carcinogen equation, RfD is the reference dose, RSC is the relative source contribution factor, 70 kg is the average weight of a human male in kilograms, and 15 ml/day is the incidental water ingestion rate in milliliters per day.

This rulemaking adopts numeric criteria for the full body contact designated use using the following decision criteria:

1. A criterion was calculated using the appropriate procedure for carcinogens or non-carcinogens;
2. For carcinogens where an OCSF was not available but an RfD was available, the non-carcinogen procedure was used and a criterion was calculated for the carcinogen using the RfD or a surrogate RfD;
3. For non-carcinogens, a criterion was calculated using available RfDs. If an RfD was not available in the Integrated Risk Information System (IRIS) but a surrogate RfD was available, such as a Minimum Risk Level (MRL) from the Agency for Toxic Substances Disease Registry (ATSDR), a criterion for the non-carcinogen was calculated using the MRL;
4. Where an OCSF, RfD or MRL was unavailable, a criterion was not derived for the full body contact designated use.
5. Where the calculated full body contact standard was more stringent than the Domestic Water Source standard for the same pollutant, the DWS value was used in place of the calculated PBC value. It is unlikely that an individual will be more at risk from incidental ingestion during recreational activities than through direct consumption.

Full Body Contact (FBC) Modifications

Parameter	CAS NUM	Current FBC standard (µg/L)	Proposed FBC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Data Source
Acenaphthylene	208968	NA	56000	New	RfD = 0.06 mg/Kg/day	https://rais.ornl.gov/tox/profiles/acenaphthene_f_V1.html
Acrylonitrile	107131	3	9	Less	MRL = 0.04 mg/Kg/day	ATSDR MRL https://www.atsdr.cdc.gov/toxprofiles/tp125.pdf
Aldrin	309002	0.08	0.27	Less	OCSF = 17 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=130
Barium	7440393	98,000 T	186667 T	Less	RSC changed to 20%	RSC = .2
Benzene	71432	93	133	Less	OCSF = 0.035 mg/Kg/day	https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0276_summary.pdf
Benzfluoranthene 3,4	205992	1.9	47.0	Less	OCSF = 7.3 mg/Kg/day	IRIS OCSF/RfD : benzo(a)pyrene PAH surrogate
Benzidine	92875	0.01	0.02	Less	OCSF = 230 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=135
Benzo (a) anthracene	56553	0.2	47.0	Less	OCSF = 7.3 mg/Kg/day	IRIS OCSF/RfD : benzo(a)pyrene PAH surrogate
Benzo (a) pyrene	50328	0.2	47.0	Less	OCSF = 7.3 mg/Kg/day	IRIS OCSF/RfD : benzo(a)pyrene PAH surrogate
Benzo (k) fluoranthene	207089	1.9	47.0	Less	OCSF = 7.3 mg/Kg/day	IRIS OCSF/RfD : benzo(a)pyrene PAH surrogate
Bis(2-chloroethoxy) methane	111911	NA	2800	New	RfD = 0.003mg/Kg/day	https://cfpub.epa.gov/ncea/pprtv/documents/Bis2chloroethoxymethane.pdf

Parameter	CAS NUM	Current FBC standard (µg/L)	Proposed FBC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Data Source
Bis(chloroethyl) ether	111444	1	4.0	Less	OCSF = 1.1 mg/Kg/Day	https://www.epa.gov/sites/production/files/2016-09/documents/dichloroethyl-ether.pdf
Bis(Chloromethyl) ether	542881	NA	0.02	New	304 (a) criterion	304 criteria
Bromoform	75252	180	591	Less	OCSF = 0.0079 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=214
Cadmium	7440439	700 T	467 T	More	RfD = 0.0005 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=141
Carbon tetrachloride	56235	11	67	Less	OCSF = 0.07 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=20
Chlordane	57749	4	13	Less	OCSF = 0.35 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=142
Chlorine (total residual)	7782505	4000	93333	Less	RfD = 0.1 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=405
Chloroethane	75003	NA	93333	New	Based on the State of Michigan's interpretation of subchronic RfD of 0.1 mg/kg-day	https://cfpub.epa.gov/ncea/pprtv/documents/Chloroethane.pdf
Chloroform	67663	230	9333	Less	RfD/OCSF = 0.01 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=25
Chloronaphthalene beta	91587	74667	298667	Less	RfD = 0.08 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=463

Parameter	CAS NUM	Current FBC standard (µg/L)	Proposed FBC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Data Source
Chromium (Total)	7440473	NA	100 T	New	Reverted to old standards despite lack of EPA data	Added FBC/PBC
Chrysene	218019	19	0.6	More	OCSF = 7.3 mg/Kg/day	IRIS OCSF/RfD : benzo(a)pyrene PAH surrogate
Cyanide (as free cyanide)	57125	18,667 T	588 T	More	RfD = 0.00063 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=31
DDT abd break down products	72548	4	14	Less	OCSF = 0.34 mg/Kg/day	OCSF/RfD from DDT
Di(2ethylhexyl) phthalate	117817	100	333	Less	RfD = 0.01 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=14
Di(2-ethylhexyl)adipate	103231	560000	3889	More	OCSF = 0.0012 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=420
Dibenz (ah) anthracene	53703	1.9	47.0	Less	Used PAH RfD surrogate (pyrene)	IRIS OCSF/RfD : benzo(a)pyrene PAH surrogate See:https://www.michigan.gov/documents/deq/deq-rrd-chem-DibenzoAHAnthraceneDatasheet_527910_7.pdf
Dibromoethane 1,2	106934	8400	2	More	OCSF = 2 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=361
Dichlorobenzene, 1,4-	106467	373333	373	More	Corrected mistake	Mistake in previous standards
Dichlorobenzidine 3,3'	91941	3	10	Less	OCSF = 0.45 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=504

Parameter	CAS NUM	Current FBC standard (µg/L)	Proposed FBC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Data Source
Dichloroethylene cis 1,2	156592	70	1867	Less	RfD = 0.002 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=418
Dichloromethane	75092	190	2333	Less	OCSF = 0.002 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=70
Dichloropropene 1,3	542756	420	93	More	OCSF = 0.05 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=224
Dieldrin	60571	0.09	0.3	Less	OCSF = 16 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=225
Dinitro o cresol 4,6	534521	NA	75	New	RfD = 0.00008 mg/kg-day	https://www.epa.gov/sites/production/files/2015-10/documents/final-2-methyl-4-6-dinitrophenol.pdf
Dinitrotoluene 2,6	606202	2	7	Less	OCSF = 0.68 mg/Kg/day	https://cswab.org/wp-content/uploads/2013/05/PPRTV-26-DNT-2013.pdf
Di-n-octyl phthalate	117840	373333	9333	More	RfD = 0.01 mg/Kg/day	https://cfpub.epa.gov/ncea/pprtv/documents/OctylPhthalatediN.pdf
Diphenylhydrazine 1,2	122667	1.8	6	Less	OCSF = 0.8 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=49
Endrin	72208	280	1120	Less	Used EPA RSC of 80%	https://www.epa.gov/sites/production/files/2016-03/documents/summary_of_inputs_final_revised_3.24.16.pdf
Endrin Aldehyde	7421933	NA	1120	New	Used Endrin MRL = 0.0003 mg/Kg/day	Used values for Endrin

Parameter	CAS NUM	Current FBC standard (µg/L)	Proposed FBC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Data Source
Guthion	86500	NA	2800	New	MRL = 0.003 mg/Kg/day	MRL 0.003 ATSDR https://www.atsdr.cdc.gov/toxprofiles/tp188.pdf
Heptachlor	76448	0.4	1	Less	OCSF = 4.5 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=243
Heptachlor epoxide	1024573	0.2	0.5	Less	OCSF = 9.1 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=160
Hexachlorobenzene	118741	1	3	Less	OCSF = 1.6 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=374
Hexachlorobutadiene	87683	18	60	Less	OCSF = 0.078 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=58
Hexachlorocyclohexane alpha	319846	0.22	0.7	Less	OCSF = 6.3 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=162
Hexachlorocyclohexane beta	319857	0.78	3	Less	OCSF = 1.8 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=244
Hexachlorocyclopentadiene	77474	9800	11200	Less	RfD = 0.006 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=59
Hexachloroethane	67721	100	117	Less	OCSF = 0.04 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=167
Hexochlorocyclohexane gamma	58999	280	700	Less	RfD = 0.0003 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=65
Indeno (1,2,3cd) pyrene	193395	1.9	47	Less	OCSF 0.1 mg/Kg/day	Used older IRIS OCSF
Isophorone	78591	1500.0	4912	Less	OCSF = 0.00095 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=63

Parameter	CAS NUM	Current FBC standard (µg/L)	Proposed FBC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Data Source
Methoxychlor	72435	4667	18667	Less	Used EPA RSC of 80%	https://www.epa.gov/sites/production/files/2016-03/documents/summary_of_inputs_final_revised_3.24.16.pdf
N nitrosodi n propylamine	621647	290	0.7	More	OCSF = 7.0 mg/kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=177
Nitrobenzene	98953	467	1867	Less	RfD = 0.002 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=79
Nitrosodibutylamine	924163	NA	0.9	New	OCSF = 5.4 mg/kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=37
Nitrosodiethylamine	55185	NA	0.03	New	OCSF = 150 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=42
Nitrosopyrrolidine	930552	NA	2	New	OCSF = 2.13 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=81
Nnitrosodimethylamine	62759	0.03	0.09	Less	OCSF = 51 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=45
Nnitrosodiphenylamine	86306	0.2	952	Less	OCSF = 0.0049 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=178
Parathion	56382	NA	5600	New	RfD = 0.006 mg/Kg/day	https://www.epa.gov/sites/production/files/2016-09/documents/parathion.pdf
Pentachlorobenzene	608935	NA	747	New	RfD = 0.0008 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=85
Polychlorinatedbiphenyls	1336363	19	2	More	OCSF = 2 mg/Kg/day	https://www.atsdr.cdc.gov/toxprofiles/tp17.pdf

Parameter	CAS NUM	Current FBC standard (µg/L)	Proposed FBC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Data Source
Tetrachlorobenzene, 1,2,4,5-	95943	NA	280	New	RfD = 0.0003 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=107
Tetrachlorodibenzopdioxin 2,3,7,8	1746016	0.00003	0.0007	Less	RfD = 0.0000000007 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=1024
Tetrachloroethane 1,1,2,2	79345	7	23	Less	OCSF = 0.2 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=193
Tetrachloroethylene	127184	9333	2222	More	OCSF = 0.0021 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=106
Thallium	7440280	75 T	9 T	More	RfD = 0.00001 mg/Kg/day	https://cfpub.epa.gov/ncea/pprtv/documents/ThalliumCarbonate.pdf
Toluene	108883	280000	149333	More	RfD = 0.08 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=118
Toxaphene	8001352	1.3	4	Less	OCSF = 1.1 mg/Kg/Day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=346 https://www.atsdr.cdc.gov/toxprofiles/tp94.pdf
Tributyltin	688733	NA	280	New	RfD = 0.0003 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=349
Trichloroethane 1,1,2	79005	25	82	Less	OCSF = 0.057 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=198
Trichloroethylene	79016	280000	101	More	OCSF = 0.046 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=199
Trichlorophenol 2,4,6	88062	130	424	Less	OCSF = 0.011 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=122

Parameter	CAS NUM	Current FBC standard (µg/L)	Proposed FBC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Data Source
Trichlorophenol, 2,4,5-	95954	NA	93333	Less	RfD = 0.1 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=121
Trichlorophenoxy proprionic acid (2,4,5-TP)	93721	7467	29867	Less	OCSF = 0.008 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=323 https://oehha.ca.gov/media/downloads/water/public-health-goal/silvexposting53002.pdf
Vinyl chloride	75014	2	6	Less	OCSF = 0.72 mg/Kg/day	Calculated FBC higher than MCL https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=1001

Methodologies for Deriving Criteria for the Partial Body Contact (PBC) Designated Use

The Department derived numeric water quality criteria for the partial body contact (PBC) designated use using the following equation:

$$\frac{\text{RfD} * \text{RSC} * 70\ \text{kg}}{15\ \text{ml/day}}$$

In this equation, RfD is the reference dose, RSC is the relative source contribution factor, 70 kg is the average weight of a human male in kilograms, and 15 ml/day is the incidental water ingestion rate in milliliters per day. The equation is the same equation used to derive numeric criteria for non-carcinogens for the full body contact designated use.

The rulemaking adopts numeric criteria for the partial body contact designated use using the following decision criteria:

1. Calculate a criterion using the PBC equation using available RfDs. If an RfD is not available in the Integrated Risk Information System (IRIS) but a surrogate RfD is available, such as a Minimum Risk Level (MRL) from the Agency for Toxic Substances and Disease Registry (ATSDR), a PBC criterion is calculated using the MRL; and
2. A criterion for the partial body contact designated use was not derived if there was no RfD or MRL.

Partial Body Contact (PBC) Modifications

Parameters	CAS NUM	Current PBC standard (µg/L)	Propoosed PBC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Change data
Acenaphthylene	208968		56000	New	RfD = 0.06 mg/Kg/day	https://rais.ornl.gov/tox/profiles/acenaphthene_f_V1.html
Barium	7440393	98,000 T	186667 T	Less	RSC changed to 20%	RSC = .2
Benzo (a) anthracene	56553	0.2	280	Less	RfD = 0.0003 mg/Kg/day	IRIS OCSF/RfD : benzo(a)pyrene PAH surrogate
Benzfluoranthene 3,4	205992	1.9	280	Less	RfD = 0.0003 mg/Kg/day	IRIS OCSF/RfD : benzo(a)pyrene PAH surrogate
Benzo (a) pyrene	50328	0.2	280	Less	RfD = 0.0003 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=136
Benzo (k) fluoranthene	207089	1.9	280	Less	RfD = 0.0003 mg/Kg/day	IRIS OCSF/RfD : benzo(a)pyrene PAH surrogate
Bis(2-chloroethoxy) methane	111911		2800	New	RfD = 0.003mg/Kg/day	https://cfpub.epa.gov/ncea/pprtv/documents/Bis2chloroethoxymethane.pdf
Bis(chloroethyl) ether	111444	1	4	Less	OCSF = 1.1 mg/Kg/Day	https://www.epa.gov/sites/production/files/2016-09/documents/dichloroethyl-ether.pdf
Cadmium	7440439	700 T	467 T	More	RfD = 0.0005 mg/Kg/day	IRIS RfD, 304 criteria
Carbon tetrachloride	56235	980	3733	Less	RfD = 0.004 mg/Kg/day	IRIS OCSF/RfD
Chlorine (total residual)	7782505	4000	93333	Less	RfD = 0.1 mg/Kg/day	RfD less stringent than MCL
Chloroethane	75003		93333	New	Based on the State of Michigan's interpretation of subchronic RfD of 0.1 mg/kg-day	https://cfpub.epa.gov/ncea/pprtv/documents/Chloroethane.pdf

Parameters	CAS NUM	Current PBC standard (µg/L)	Propoosed PBC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Change data
Chloronaphthalene beta	91587	74667	298667	Less	RfD = 0.08 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=463
Chromium (Total)	7440473		100 T	New	Reverted to old standards despite lack of EPA data	Added FBC/PBC
Chrysene	218019	19	0.6	More	RfD = 0.0003 mg/Kg/day	IRIS OCSF/RfD : benzo(a)pyrene PAH surrogate
Cyanide	57125	18,667 T	588 T	More	RfD = 0.00063 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=31
Dibenz (ah) anthracene	53703	1.9	280	Less	Used PAH RfD surrogate (pyrene)	IRIS OCSF/RfD : benzo(a)pyrene PAH surrogate See:https://www.michigan.gov/documents/deq/deq-rrd-chem-DibenzoAHAnthraceneDatasheet_527910_7.pdf
Dichlorobenzidine 3,3'	91941	3	10	Less	OCSF = 0.45 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=504
Dichloroethylene cis 1,2	156592	70	1867	Less	RfD = 0.002 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=418
Dichloromethane	75092	56000	5600	More	RfD = 0.006 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=70
Dinitro o cresol 4,6	534521	3.733	75	Less	RfD = 0.00008 mg/kg-day	https://www.epa.gov/sites/production/files/2015-10/documents/final-2-methyl-4-6-dinitrophenol.pdf
Dinitrotoluene 2,6	606202	3733	280	More	RfD = 0.0003 mg/Kg/day	https://cswab.org/wp-content/uploads/2013/05/PPRTV-26-DNT-2013.pdf

Parameters	CAS NUM	Current PBC standard (µg/L)	Propoosed PBC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Change data
Di-n-octyl phthalate	117840	373333	9333	More	RfD = 0.01 mg/Kg/day	https://cfpub.epa.gov/ncea/pprtv/documents/OctylPhthalatediN.pdf
Diphenylhydrazine 1,2	122667	1.8	6	Less	OCSF = 0.8 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=49
Endrin Aldehyde	7421933		280	New	Used Endrin MRL = 0.0003 mg/Kg/day	Used values for Endrin
Guthion	86500		2800	New	MRL = 0.003 mg/Kg/day	MRL 0.003 ATSDR https://www.atsdr.cdc.gov/toxprofiles/tp188.pdf
Hexochlorocyclohexane gamma	58999	280	700	Less	RfD = 0.0003 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=65
Hexachlorocyclopentadiene	77474	9800	11200	Less	RfD = 0.006 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=59
Hexachloroethane	67721	933	653	More	RfD = 0.0007 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=167
Indeno (1,2,3cd) pyrene	193395	1.9	47	Less	OCSF 0.1 mg/Kg/day	Used older IRIS OCSF

Parameters	CAS NUM	Current PBC standard (µg/L)	Propoosed PBC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Change data
Mirex	2385855	187	0.26	More	RfD = 0.0002 mg/Kg/day	https://oehha.ca.gov/chemicals/mirex Changed OCSF and BCF https://books.google.com/books?id=ibJKf8Gqi5gC&pg=PA208&lpg=PA208&dq=Mirex+bcf&source=bl&ots=j-SHf82Xs3&sig=JCFi4W60MBVk03KeQgiMdxWvFig&hl=en&sa=X&ved=0ahUKEwjSrKe8tOzZAhUEzWMKHXPWC2EQ6AEIPzAC#v=onepage&q=Mirex%20bcf&f=false
Nitrobenzene	98953	467	1867	Less	RfD = 0.002 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=79
Nnitrosodimethylamine	62759	0.03	0.09	Less	OCSF = 51 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=45
N nitrosodi n propylamine	621647	290	0.7	More	OCSF = 7.0 mg/kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=177
Nnitrosodiphenylamine	86306	88667	952	More	OCSF = 0.0049 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=178
Parathion	56382		5600	New	RfD = 0.006 mg/Kg/day	https://www.epa.gov/sites/production/files/2016-09/documents/parathion.pdf
Pentachlorobenzene	608935		747	New	RfD = 0.0008 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=85
Pentachlorophenol	87865	28000	4667	More	RfD = 0.005 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=86

Parameters	CAS NUM	Current PBC standard (µg/L)	Propoosed PBC standard (µg/L)	More or less restrictive	Modified Data used to Calculate Standard	Change data
1,2,4,5-Tetrachlorobenzene	95943		280	New	RfD = 0.0003 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=107
Tetrachloroethane 1,1,2,2	79345	56000	186667	Less	RfD = 0.05 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=193
Tetrachloroethylene	127184	9333	5600	More	RfD = 0.006 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=106
Thallium	7440280	75 T	9 T	More	RfD = 0.00001 mg/Kg/day	https://cfpub.epa.gov/ncea/pprtv/documents/ThalliumCarbonate.pdf
Toluene	108883	280000	149333	More	RfD = 0.08 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=118
Toxaphene	8001352	933	1867	Less	MRL = 0.002 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=346 https://www.atsdr.cdc.gov/toxprofiles/tp94.pdf
Tributyltin	688733		280	New	RfD = 0.0003 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=349
Trichloroethylene	79016	280	467	Less	RfD = 0.0005 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=199
2,4,5-Trichlorophenol	95954		93333	New	RfD = 0.1 mg/Kg/day	https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=121
Trichlorophenoxy) propionic acid 2(2,4,5	93721	7467	29867	Less	RSC changed to 80%	US EPA RSC = 0.8

RfD = Reference Dose - An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

MRL = Minimal Risk Level - An Agency for Toxic Substances and Disease Registry (ATSDR) estimate of daily human exposure to a hazardous substance at or below which that substance is unlikely to pose a measurable risk of adverse, noncancerous effects.

304 (a) criteria - U.S. EPA - Human health ambient water quality criteria represent specific levels of chemicals or conditions in a water body that are not expected to cause adverse effects to human health.

PAH = Polycyclic Aromatic Hydrocarbon - Organic compounds containing only carbon and hydrogen—that are composed of multiple aromatic rings.

OCSF = Oral Cancer Slope Factor - An estimate of the risk of cancer associated with exposure to a carcinogenic or potentially carcinogenic substance. A slope factor is an upper bound, approximating a 95% confidence limit, on the increased cancer risk from a lifetime exposure to an agent by ingestion or inhalation.

Cancelled/banned pesticide - Registration cancelled by EPA. Essentially banned.

Numeric Water Quality Standards for Aquatic and Wildlife Designated Uses in Table 1

Currently, there are numeric criteria for 98 pollutants to maintain and protect water quality for the aquatic life and wildlife (A&W) designated uses. In this rulemaking ADEQ proposes new and revised criteria for existing numeric A&W criteria for four parameters. In most cases, CWA § 304(a) national criteria recommendations to protect freshwater aquatic life have been adopted. New numeric water quality standards for previously unregulated pollutants include Carbaryl, Dementon, Diazinon, and Nonylphenol.

Under the Clean Water Act, 304(a) criteria for the Aquatic Life use is derived using what data is available for all aquatic species. As such, data from cold water species like salmonids (trout), that tend to be more sensitive to toxins, serve to make criteria more stringent. Because Arizona has an incredibly diverse landscape, from lowland deserts to alpine peaks over 12,000 ft. in altitude, one set of standards covering the entire state makes little sense. To address this issue, the state has broken down the Aquatic Life use into four sub uses that more accurately characterize our varied aquatic ecosystems (cold, warm, effluent dependent, and ephemeral).

Generally, the state starts with data contained in the US EPA 304(a) Aquatic Life criteria document and then uses the site specific species deletion procedure to recalculate the standards for our different uses. For standards for the Aquatic and Wildlife Coldwater use, we employ salmonids and other cold water species. For Aquatic and Wildlife Warmwater, data from coldwater species are usually not considered. For Aquatic and Wildlife Effluent Dependent, we use warmwater species that generally occur in nutrient rich, lower oxygen environments. For Aquatic and Wildlife Ephemeral, we use data from organisms with short lifecycles such as insects, which can take advantage of short pulses of water from flash floods.

Aquatic & Wildlife Uses Modifications in Table 1

PARAMETER	CAS NUMBER	Current A&Wc Acute (µg/L)	Proposed A&Wc Acute (µg/L)	Current A&Wc Chronic (µg/L)	Proposed A&Wc Chronic (µg/L)	Current A&Ww Acute (µg/L)	Proposed A&Ww Acute (µg/L)	Current A&Ww Chronic (µg/L)	Proposed A&Ww Chronic (µg/L)	Current A&Wedw Acute| (µg/L)	Proposed A&Wedw Acute| (µg/L)	Current A&Wedw Chronic (µg/L)	Proposed A&Wedw Chronic (µg/L)	Current A&We Acute (µg/L)	Proposed A&We Acute (µg/L)	Change data
Acrolein	107028	34	3	30	3	34	3	30	3	34	3	30	3		3	CWA §304 criteria (2009)
Ammonia	7664417	See Table	See Table	See Table	See Table	See Table	See Table	See Table	See Table	See Table	See Table	See Table	See Table			CWA §304 criteria (2013)
Cadmium	7440439	See Table	See Table	See Table	See Table	See Table	See Table	See Table	See Table	See Table	See Table	See Table	See Table	See Table	See Table	CWA §304 criteria (2016)
Carbaryl	63252		2.1		2.1		2.1		2.1		2.1		2.1		2.1	CWA §304 criteria (2012)
Demeton	8065483				0.01				0.01				0.01			CWA §304 criteria (1985)
Diazinon	333415		0.17		0.17		0.17		0.17		0.17		0.17		0.17	CWA §304 criteria (2005)
Nonylphenol	104405		27.8		6.6		27.8		6.6		27.8		6.6		27.8	CWA §304 criteria (2005)

Modifications to Hardness Dependent Tables for Aquatic and Wildlife Uses *[Tables 2 through 6]*

The numeric water quality standards for certain metals are expressed as a function of hardness because hardness can affect the toxicities of the metals to aquatic life. These "hardness-dependent" pollutants include cadmium, chromium III, copper, lead, nickel, silver, and zinc. Increasing hardness has the effect of decreasing the toxicity of the metals.

In this Triennial Review, ADEQ intends to make modifications to the standards for chromium III, copper, lead, and cadmium. Chromium III, copper, and lead are being updated due to rounding errors from the last rulemaking in 2016. In 2016, EPA issued a new 304(a) criteria document for cadmium. ADEQ is updating its aquatic and wildlife standards for cadmium to align with this EPA criteria. For A&Wc, the acute standard is slightly more stringent while the chronic standard is less stringent. For A&Ww, and A&Wedw, the acute standards are less stringent and the chronic standards are more stringent. For A&We, the acute standard is more stringent.

Ammonia [New Tables 11 through 17]

In 2013 the U.S. EPA issued a new aquatic and wildlife criteria document for ammonia. EPA Office of Water, *Aquatic Life Ambient Water quality Criteria for Ammonia – Freshwater* (2013), *available at* https://www.epa.gov/sites/production/files/2015-08/documents/aquatic-life-ambient-water-quality-criteria-for-ammonia-freshwater-2013.pdf. The new criteria considered toxicological data for unionidae, a family of fresh water mussels that were not included in previous criteria documents. As unionidae are particularly sensitive to ammonia toxicity, this will have the effect of making the standard more stringent for waters where unionids are present.

A 2009 study by Dr. Terry Myers, funded by an Arizona Game and Fish Heritage Grant, found that there was evidence of wide spread pre Columbian occurrence for unionids in Arizona, including the Colorado and Santa Cruz rivers, more recent occurrences in the Little Colorado and San Pedro rivers and Chevelon Creek and that there are extant populations in the watershed of the Black River, in the White Mountains.

Given the Clean Water Act goals to restore and maintain the integrity of the Nations waters, the widespread historic range of unionidae, both in spatial extent and altitude, and the extant population in the White Mountains, it is important that we address ammonia toxicity to unionids, where they occur or where they could be reestablished.

For the aquatic and wildlife cold and warm water uses, unionidae will be assumed to be present unless a study is performed demonstrating that they are absent and there is no historic evidence of their presence, or hydrologic modification has altered the flow regime in a way that would prevent their reestablishment. The aquatic and wildlife effluent dependent water use will apply standards that do not address unionid toxicity because effluent dependent waters (EDWs) are situated in channels that were dry prior to permitted discharge. Therefore, ADEQ proposes ammonia standards for EDWs only for the absence of unionid mussels. No ammonia standards are currently established for ephemeral waters. Because ephemeral waters are dry most of the year and unionid mussels cannot be present, ADEQ is not proposing ammonia standards for ephemeral waters.

The new ammonia standards are applicable by table in Appendix A as follows:

	A&Wc	*A&Ww*	*A&Wedw*	*A&We*
Acute & Mussels Present	New Table 11	New Table 12	None.	None.
Chronic & Mussels Present	New Table 13	New Table 13	None.	None.
Acute & Mussels Absent	New Table 14	New Table 15	New Table 15	None.
Chronic & Mussels Absent	New Table 17	New Table 16	New Table 16	None.

Modifications to Listed Surface Waters and Designated Uses [Appendix B]

Appendix B lists surface waters and their designated uses. ADEQ proposes 101 non-substantive updates to Appendix B including name corrections to 55 waters, 47 description updates, and remove two waterbodies listed in error. These updates are needed to be consistent with waterbody names in the National Hydrography Dataset, to make stream reach descriptions and lake locations more accurate, and to remove errors to make Appendix B more accurate. The two errors include Pretty Water Lake and Williams Ranch Tanks. Pretty Water Lake is located in California and therefore outside of Arizona's CWA jurisdictional authority. Williams Ranch Tanks is a private water tank located on private land, and therefore not subject to Arizona's CWA jurisdictional authority. Also, one water body segment that was mistakenly omitted in the last triennial review process was re-inserted. This water body is in the Salt River watershed, a reach currently described as the "White Mountain Apache Reservation Boundary at 33°48'52"/110°31'33" to Roosevelt Lake," but which was previously called "Confluence of White River and Black River to Roosevelt Lake." *Triennial Review NFRM*, 14 A.A.R. 4708, 4921 (Dec. 26 2008); *but see* Triennial Review NFRM, 22 A.A.R. 2328, 2394 (Sept. 2, 2016).

ADEQ is not proposing substantive changes to Appendix B because the underlying definition of Waters of the United States is so unsettled at this time. Understanding what the definition of "Waters of the United States" (WOTUS) is and what it means has been in flux since the 1972 CWA Amendments. The definition has been highly litigated over the years. The most influential recent Supreme Court case was *Rapanos v. United States*, 547 U.S. 715 (2006), which was a split decision that did not alleviate the confusion surrounding WOTUS interpretations. Since that case was decided, EPA issued the Clean Water Rule in 2015 to attempt to clarify WOTUS. This rule was immediately challenged in court, and its implementation of has been delayed by various legal mechanisms over the years. *See North Dakota v. United States EPA*, 127 F. Supp. 3d 1047 (D.N.D. 2015) (North Dakota District Court issued a stay of the rule, which is currently still applicable in 13 states, including Arizona, precluding applicability of rule until the court decides the challenge to the rule); *Murray Energy Corp. v. United States DOD* (In re United States DOD), 817 F.3d 261 (6th Cir. 2016) (6th Circuit Court of Appeals issued a nationally applicable preliminary injunction); *but see*

Nat'l Ass'n of Mfrs. v. DOD, 138 S. Ct. 617, 199 L.Ed.2d 501 (2018) (Supreme Court reversed the lower circuit court's nationally applicable preliminary injunction decision); *see also Addition of an Applicability Date to 2015 Clean Water Rule*, 83 Fed. Reg. 5200 (Feb. 6, 2018) (final rule immediately delayed applicability of 2015 Clean Water Rule to Feb. 6, 2020). Further, the current U.S. presidential administration has begun to implement a plan to delay, repeal, and replace the 2015 Clean Water Rule, for which EPA has already taken rulemaking action. EPA is expected to propose a replacement rule this fall to define WOTUS.

Modifications to Site Specific Standards [Appendix C]

In 2016, ADEQ issued site specific standards for copper for Bright Angel Wash and Transept Canyon. EPA disapproved these site specific standards in 2016. Therefore, ADEQ is repealing the standards in this rulemaking.

6. A reference to any study relevant to the rule that the agency reviewed and proposes either to rely on or not to rely on in its evaluation of or justification for the rule, where the public may obtain or review each study, all data underlying each study, and any analysis of each study and other supporting material:

Most studies are the 304(a) criteria for each of the pollutant, as referenced throughout the document. For most numeric standards changes, please refer to the modifications to Appendix A. Other studies are cited in the individual section explanations and are also listed below:

- Myers, T. L. 2009. *Pre-historical, Historical, and Recent Distribution of Freshwater Mussels (Unionidae: Anodonta) in the Colorado River and Río Yaqui Basins (with notes on Guzmán Basin, Río Sonoyta, Río Asunción/Magdalena, and Rio Grande)*. Arizona Game and Fish Department Heritage Grant Project # I07011.

  This study was used to evaluate how the ammonia standard should be applied in Arizona.

7. A showing of good cause why the rulemaking is necessary to promote a statewide interest if the rulemaking will diminish a previous grant of authority of a political subdivision of this state:

Not applicable. The proposed amendments do not diminish a previous grant of authority of a political subdivision of this state.

8. The preliminary summary of the economic, small business, and consumer impact:

The overall impact of the proposed changes should be minor. The changes are intended to improve clarity, correct errors, and to better align with recent EPA standards changes. The clarifications and correction of errors should benefit everyone, but particularly AZPDES permittees, who read and interpret the rules. Persons most affected by this rulemaking are current and future permittees under the Arizona Pollutant Discharge Elimination System (AZPDES) permitting program. The Arizona Department of Environmental

Quality (ADEQ) anticipates that a few of the rule changes may have a more specific impact. However, only a low percentage of existing permittees will experience any impact to their permits. In addition to any costs, these rules overall benefit the general public. These rules ensure that clean water will be available as a source for drinking water, bathing, cooking, and is safe for swimming, fishing, boating, or other water-based recreation. The rules also ensure that agriculture, wildlife and fisheries needs for good quality water are met.

As a part of the standards updates, ADEQ is proposing new ammonia criteria to align with EPA's criteria, which is based on the presence or possible presence of unionid mussels, a species that has historically been present in Arizona's waters (except ephemeral waters).

- Impact to most dischargers will be minimal.
- Of the 142 AZDPES permits, 124 will not be affected.
- Of the 18 AZPDES discharges to perennial waters that may be affected, only 4 may have issues complying with the standard. There are potentially other legal options available to these dischargers (e.g. variances or mixing zones).
- Overall, the proposed ammonia standard will be less stringent for effluent dependent waters.

9. The agency's contact person who can answer questions about the economic, small business and consumer impact statement:

Name:	Heidi M. Haggerty Welborn
Address:	1110 W. Washington St. Phoenix, AZ 85007
Telephone:	(602) 771-4815
E-mail:	WaterQualityStandards@azdeq.gov

10. The time, place, and nature of the proceedings to make, amend, repeal, or renumber the rule, or if no proceeding is scheduled, where, when, and how persons may request an oral proceeding on the proposed rule:

ADEQ has scheduled an oral proceeding to receive oral comments on the rules, in accordance with A.R.S. § 41-1023; the time, place, and location of the hearing are listed below:

Date of hearing:	[TBD, at least 45 days after publication pursuant to 40 C.F.R. § 25.5, approximately the third week of January 2019]
Time:	[TBD]
Location:	Department of Environmental Quality 1110 W. Washington, Room 3175 Phoenix, AZ 85007
Nature:	Oral Proceeding on the proposed rules, with opportunity for formal comments on the

record

Close of Comment: 5:00 p.m. on Date of Hearing

Written or emailed comments related to this rulemaking may be submitted at any time during the public comment period to the person referenced above. Close of comment period will occur on [TBD] at 5:00 p.m.

ADEQ will take reasonable measures to provide access to department services to individuals with limited ability to speak, write or understand English and/or to those with disabilities. Requests for language interpretation, ASL interpretation, CART captioning services or disability accommodations must be made at least 48 hours in advance by contacting Ian Bingham, Title VI Nondiscrimination Coordinator at 602-771-4322 or Bingham.Ian@azdeq.gov. Teleprinter services are available by calling 7-1-1 at least 48 hours in advance to make necessary arrangements.

11. All agencies shall list other matters prescribed by statute applicable to the specific agency or to any specific rule or class of rules. Additionally, an agency subject to Council review under A.R.S. §§ 41-1052 and 41-1055 shall respond to the following questions:

There are no other matters prescribed by statute applicable specifically to ADEQ or this specific rulemaking.

a. Whether the rule requires a permit, whether a general permit is used and if not, the reasons why a general permit is not used:

Not applicable. This rulemaking is a water quality standards rulemaking and does not require a permit.

b. Whether a federal law is applicable to the subject of the rule, whether the rule is more stringent than federal law and if so, citation to the statutory authority to exceed the requirements of federal law:

The federal Clean Water Act and implementing regulations adopted by EPA apply to the subject of this rule, as described in section 5 above. This rulemaking is no more stringent than required by federal law. However, pursuant to A.R.S. § 49-221(B), ADEQ does have inherent authority to establish water quality standards for all waters of the state, including waters beyond those required to be regulated under the Clean Water Act.

c. Whether a person submitted an analysis to the agency that compares the rule's impact of the competitiveness of business in this state to the impact on business in other states:

No such analysis was submitted.

12. A list of any incorporated by reference material as specified in A.R.S. § 41-1028 and its location in the rules:

None.

13. The full text of the rules follows:

TITLE 18 ENVIRONMENTAL QUALITY

CHAPTER 9 DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER POLLUTION CONTROL

ARTICLE 1 WATER QUALITY STANDARDS FOR SURFACE WATER

R18-11-101. Definitions

The following terms apply to this Article:

1. "Acute toxicity" means toxicity involving a stimulus severe enough to induce a rapid response. In aquatic toxicity tests, an effect observed in 96 hours or less is considered acute.
2. "Agricultural irrigation (AgI)" means the use of a surface water for crop irrigation.
3. "Agricultural livestock watering (AgL)" means the use of a surface water as a water supply for consumption by livestock.
4. "Annual mean" is the arithmetic mean of monthly values determined over a consecutive 12-month period, provided that monthly values are determined for at least three months. A monthly value is the arithmetic mean of all values determined in a calendar month.
5. "Aquatic and wildlife (cold water) (A&Wc)" means the use of a surface water by animals, plants, or other cold-water organisms, generally occurring at an elevation greater than 5000 feet, for habitation, growth, or propagation.
6. "Aquatic and wildlife (effluent-dependent water) (A&Wedw)" means the use of an effluent-dependent water by animals, plants, or other organisms for habitation, growth, or propagation.
7. "Aquatic and wildlife (ephemeral) (A&We)" means the use of an ephemeral water by animals, plants, or other organisms, excluding fish, for habitation, growth, or propagation.
8. "Aquatic and wildlife (warm water) (A&Ww)" means the use of a surface water by animals, plants, or other warm-water organisms, generally occurring at an elevation less than 5000 feet, for habitation, growth, or propagation.
9. "Arizona Pollutant Discharge Elimination System (AZPDES)" means the point source discharge permitting program established under 18 A.A.C. 9, Article 9.
10. "Assimilative capacity" means the difference between the baseline water quality concentration for a pollutant and the most stringent applicable water quality criterion for that pollutant.
11. "Clean Water Act" means the Federal Water Pollution Control Act [33 U.S.C. 1251 to 1387].
12. "Complete Mixing" means the location at which concentration of a pollutant across a transect of a surface water differs by less than five percent.

~~12~~13. "Criteria" means elements of water quality standards that are expressed as pollutant concentrations, levels, or narrative statements representing a water quality that supports a designated use.

~~13~~14. "Critical flow ~~condition~~ conditions of the discharge" means the ~~lowest flow over seven consecutive days that has a probability of occurring once in 10 years (7 Q 10)~~ hydrologically based discharge flow averages that enable the director to calculate and properly implement applicable water quality criteria to a mixing zone's receiving water as follows:

a. For acute aquatic water quality standard criteria, the discharge flow critical condition is represented by the maximum one-day average flow analyzed over a timeframe that is reasonably representative of critical flow conditions.

b. For chronic aquatic water quality standard criteria, the discharge flow critical flow condition is represented by the maximum monthly average flow averaged over a timeframe that is reasonably representative of critical flow conditions.

c. For human health based water quality standard criteria, the discharge flow critical condition is the long-term arithmetic mean flow, averaged over several years so as to simulate long-term exposure.

15. "Critical flow conditions of the receiving water" means the hydrologically based receiving water low flow averages that enable the director to calculate and properly implement applicable water quality criteria to a mixing zone's receiving water as follows:

a. For acute aquatic water quality standard criteria, the receiving water critical condition is represented as the lowest one-day average flow event expected to occur once every ten years, on average (1Q10).

b. For chronic aquatic water quality standard criteria, the receiving water critical flow condition is represented as the lowest seven consecutive day average flow expected to occur once every ten years, on average (7Q10).

c. For human health based water quality standard criteria, the receiving water critical flow condition is the harmonic mean flow, which is a statistical estimate of toxic pollutant concentrations contained in two liters per day, assuming a high daily variation in flow rate over several years in order to simulate long-term exposure.

~~14.~~16. "Deep lake" means a lake or reservoir with an average depth of more than 6 meters.

~~15.~~17. "Designated use" means a use specified in Appendix B of this Article for a surface water.

~~16.~~18. "Domestic water source (DWS)" means the use of a surface water as a source of potable water. Treatment of a surface water may be necessary to yield a finished water suitable for human consumption.

~~17.~~19. "Effluent-dependent water (EDW)" means a surface water, classified under R18-11-113 that consists of a point source discharge of wastewater. An effluent-dependent water is a surface water that, without the point source discharge of wastewater, would be an ephemeral water.

~~18.~~20. "Ephemeral water" means a surface water that has a channel that is at all times above the water table and flows only in direct response to precipitation.

~~19.~~21. "Existing use" means a use attained in the waterbody on or after November 28, 1975, whether or not it is included in the water quality standards.

~~20.~~22. "Fish consumption (FC)" means the use of a surface water by humans for harvesting aquatic organisms for consumption. Harvestable aquatic organisms include, but are not limited to, fish, clams, turtles, crayfish, and frogs.

~~21.~~23. "Full-body contact (FBC)" means the use of a surface water for swimming or other recreational activity that causes the human body to come into direct contact with the water to the point of complete submergence. The use is such that ingestion of the water is likely and sensitive body organs, such as the eyes, ears, or nose, may be exposed to direct contact with the water.

~~22.~~24. "Geometric mean" means the nth root of the product of n items or values. The geometric mean is calculated using the following formula:

$$GM_Y = \sqrt[n]{(Y_1)(Y_2)(Y_3)¼ (Y_n)}$$

~~23.~~25. "Hardness" means the sum of the calcium and magnesium concentrations, expressed as calcium carbonate ($CaCO_3$) in milligrams per liter.

26. "Highest attainable condition" means a quantifiable expression of the water quality demonstrating the closest possible alignment to an applicable designated use that can be achieved during the term of a variance according to requirements in A.A.C. R18-11-122, regardless of whether the use is a Clean Water Act § 101(a)(2) use.

~~24.~~27. "Igneous lake" means a lake located in volcanic, basaltic, or granite geology and soils.

~~25.~~28. "Intermittent water" means a stream or reach that flows continuously only at certain times of the year, as when it receives water from a spring or from another surface source, such as melting snow.

~~26.~~29. "Mixing zone" means an area or volume of a surface water that is contiguous to a point source discharge where dilution of the discharge takes place.

~~27.~~30. "Oil" means petroleum in any form, including crude oil, gasoline, fuel oil, diesel oil, lubricating oil, or sludge.

~~28.~~31. "Outstanding Arizona water (OAW)" means a surface water that is classified as an outstanding state resource water by the Director under R18-11-112.

~~29.~~32. "Partial-body contact (PBC)" means the recreational use of a surface water that may cause the human body to come into direct contact with the water, but normally not to the point of complete submergence (for example, wading or boating). The use is such that ingestion of the water is not likely and sensitive body organs, such as the eyes, ears, or nose, will not normally be exposed to direct contact with the water.

~~30.~~33. "Perennial water" means a surface water that flows continuously throughout the year.

~~31.~~34. *"Pollutant" means fluids, contaminants, toxic wastes, toxic pollutants, dredged spoil, solid waste, substances and chemicals, pesticides, herbicides, fertilizers and other agricultural chemicals, incinerator residue, sewage, garbage, sewage sludge, munitions, petroleum products, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and mining, industrial, municipal, and agricultural wastes or any other liquid, solid, gaseous, or hazardous substance.* A.R.S § 49-201(29)

35. "Pollutant Minimization Program" means a structured set of activities to improve processes and pollutant controls that will prevent and reduce pollutant loadings.

~~32.~~36. "Practical quantitation limit" means the lowest level of quantitative measurement that can be reliably achieved during a routine laboratory operation.

~~33.~~37. "Reference condition" means a set of ~~ecological measurements from a population of relatively undisturbed waterbodies within a region that establish a basis for making comparisons of biological condition among samples~~ abiotic physical stream habitat, water quality, and site selection criteria established by the Director that describe the typical characteristics of stream sites in a region that are least disturbed by environmental stressors. From these criteria, the Director identifies reference biological assemblages of macroinvertebrate and algae and calculates the Arizona Indexes of Biological Integrity.

~~34.~~38. "Regional Administrator" means the Regional Administrator of Region IX of the U.S. Environmental Protection Agency.

~~35.~~39. "Regulated discharge" means a point-source discharge regulated under an AZPDES permit, a discharge regulated by a § 404 permit, and any discharge authorized by a federal permit or license that is subject to state water quality certification under § 401 of the Clean Water Act.

~~36.~~40. "Riffle habitat" means a stream segment where moderate water velocity and substrate roughness produce moderately turbulent conditions that break the surface tension of the water and may produce breaking wavelets that turn the surface water into white water.

~~37.~~41. "Run habitat" means a stream segment where there is moderate water velocity that does not break the surface tension of the water and does not produce breaking wavelets that turn the surface water into white water.

~~38.~~42. "Sedimentary lake" means a lake or reservoir in sedimentary or karst geology and soils.

~~39.~~43. "Shallow lake" means a lake or reservoir, excluding an urban lake, with a smaller, flatter morphology and an average depth of less than 3 meters and a maximum depth of less than 4 meters.

~~40.~~44. "Significant degradation" means:

a. The consumption of 20 percent or more of the available assimilative capacity for a pollutant of concern at critical flow conditions, or

b. Any consumption of assimilative capacity beyond the cumulative cap of 50 percent of assimilative capacity.

~~41.~~45. "Surface water" means a water of the United States and includes the following:

a. A water that is currently used, was used in the past, or may be susceptible to use in interstate or foreign commerce;

b. An interstate water, including an interstate wetland;

c. All other waters, such as an intrastate lake, reservoir, natural pond, river, stream (including an intermittent or ephemeral stream), creek, wash, draw, mudflat, sandflat, wetland, slough, backwater, prairie pothole, wet meadow, or playa lake, the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce, including any such water:

i. That is or could be used by interstate or foreign travelers for recreational or other purposes;

ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

iii. That is used or could be used for industrial purposes by industries in interstate or foreign commerce;

d. An impoundment of a surface water as defined by this definition;

e. A tributary of a surface water identified in subsections (41)(a) through (d); and

f. A wetland adjacent to a surface water identified in subsections (41)(a) through (e).

~~42.~~46. "Total nitrogen" means the sum of the concentrations of ammonia (NH_3), ammonium ion (NH_4+), nitrite (NO_2), and nitrate (NO_3), and dissolved and particulate organic nitrogen expressed as elemental nitrogen.

~~43.~~47. "Total phosphorus" means all of the phosphorus present in a sample, regardless of form, as measured by a persulfate digestion procedure.

~~44.~~48. "Toxic" means a pollutant or combination of pollutants, that after discharge and upon exposure, ingestion, inhalation, or assimilation into an organism, either directly from the environment or indirectly by ingestion through food chains, may cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), or physical deformations in the organism or its offspring.

~~45.~~49. "Urban lake" means a manmade lake within an urban landscape.

~~46.~~50. "Use attainability analysis" means a structured scientific assessment of the factors affecting the attainment of a designated use including physical, chemical, biological, and economic factors.

51. "Variance" means a time-limited designated use and criterion for a specific pollutant(s) or water quality parameter(s) that reflect the highest attainable condition during the term of the variance.

~~47.~~52. "Wadeable" means a surface water can be safely crossed on foot and sampled without a boat.

~~48.~~53. "Wastewater" does not mean:

a. Stormwater,

b. Discharges authorized under the De Minimus General Permit,

c. Other allowable non-stormwater discharges permitted under the Construction General Permit or the Multi-sector General Permit, or

d. Stormwater discharges from a municipal storm sewer system (MS4) containing incidental amounts of non-stormwater that the MS4 is not required to prohibit.

~~49~~54. "Wetland" means an area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. A wetland includes a swamp, marsh, bog, cienega, tinaja, and similar areas.

~~50. "Zone of passage" means a continuous water route of volume, cross-sectional area, and quality necessary to allow passage of free-swimming or drifting organisms with no acutely toxic effect produced on the organisms.~~

55. "Zone of initial dilution" means a small area in the immediate vicinity of an outfall structure in which turbulence is high and causes rapid mixing with the surrounding water.

R18-11-107.01. Antidegradation Criteria

A. Tier 1 antidegradation protection.

1. Tier 1 antidegradation protection applies to the following surface waters:
   a. A surface water listed on the 303(d) list for the pollutant that resulted in the listing,
   b. An effluent dependent water,
   c. An ephemeral water,
   d. An intermittent water, and
   e. A canal listed in Appendix B.
2. A regulated discharge shall not cause a violation of a surface water quality standard or a wasteload allocation in a total maximum daily load approved by EPA.

3. Except as provided in subsections (E) and (F), Tier 1 antidegradation review requirements are satisfied for a point-source discharge regulated under an individual AZPDES permit to an ephemeral water, effluent dependent water, intermittent water, or a canal listed in Appendix B, if water quality-based effluent limitations designed to achieve compliance with applicable surface water quality standards are established in the permit and technology-based requirements of the Clean Water Act for the point source discharge are met.

B. Tier 2 antidegradation protection.

1. Tier 2 antidegradation protection applies to a perennial water with existing water quality that is better than applicable water quality standards. A perennial water that is not listed in subsection (A)(1) nor classified as an OAW under A.A.C. R18-9-112(G) has Tier 2 antidegradation protection for all pollutants of concern.
2. A regulated discharge that meets the following criteria, at critical flow conditions, does not cause significant degradation:
   a. The regulated discharge consumes less than 20 percent of the available assimilative capacity for each pollutant of concern, and
   b. At least 50 percent of the assimilative capacity for each pollutant of concern remains available in the surface water for each pollutant of concern.
3. Antidegradation review. Any person proposing a new or expanded regulated discharge under an individual AZPDES permit that may cause significant degradation shall provide ADEQ with the following information:
   a. Baseline characterization. A person seeking authorization to discharge under an individual AZDES permit to a perennial water shall provide baseline water quality data on pollutants of concern where no data exists or there are insufficient data to characterize baseline water quality and to determine available assimilative capacity. A discharger shall characterize baseline water quality at a location upstream of the proposed discharge location;
   ~~a~~b. Alternative analysis.
      i. The person seeking authorization for the discharge shall prepare and submit a written analysis of alternatives to the discharge. The analysis shall provide information on all reasonable, cost-effective, less-degrading or non-degrading discharge alternatives. Alternatives may include wastewater treatment process changes or upgrades, pollution prevention measures, source reduction, water reclamation, alternative discharge locations, groundwater recharge, land application or treatment, local pretreatment programs, improved operation and maintenance of existing systems, seasonal or controlled discharge to avoid critical flow conditions, and zero discharge;

ii. The alternatives analysis shall include cost information on base pollution control measures associated with the regulated discharge and cost information for each alternative;

iii. The person shall implement the alternative that is cost-effective and reasonable, results in the least degradation, and is approved by the Director. An alternative is cost-effective and reasonable if treatment costs associated with the alternative are less than a 10 percent increase above the cost of base pollution control measures;

iv. For purposes of this subsection, "base pollution control measures" are water pollution control measures required to meet technology-based requirements of the Clean Water Act and water quality-based effluent limits designed to achieve compliance with applicable water quality standards;

~~b~~c. Social and economic justification. The person shall demonstrate to the Director that significant degradation is necessary to accommodate important economic or social development in the local area. The person seeking authorization for the discharge shall prepare a written social and economic justification that includes a description of the following:

i. The geographic area where significant degradation of existing water quality will occur;

ii. The current baseline social and economic conditions in the local area;

iii. The net positive social and economic effects of development associated with the regulated discharge and allowing significant degradation;

iv. The negative social, environmental, and economic effects of allowing significant degradation of existing water quality; and

v. Alternatives to the regulated discharge that do not significantly degrade water quality yet may yield comparable social and economic benefits~~:~~.

~~c. Baseline characterization. A person seeking authorization to discharge under an individual AZPDES permit to a perennial water shall provide baseline water quality data on pollutants of concern where no data exist or there are insufficient data to characterize baseline water quality and to determine available assimilative capacity. A discharger shall characterize baseline water quality at a location upstream of the proposed discharge location; and~~

4. For purposes of this Section, the term "pollutant of concern" means a pollutant with either a numeric or narrative water quality standard.

5. Public participation. The Director shall provide public notice and an opportunity to comment on an antidegradation review under subsection (B)(3) and shall provide an opportunity for a public hearing under A.A.C. R18-9-A908(B).

C. Tier 3 antidegradation protection.

1. Tier 3 antidegradation protection applies only to an OAW listed in R18-11-112(G).

2. A new or expanded point-source discharge directly to an OAW is prohibited.
3. A person seeking authorization for a regulated discharge to a tributary to, or upstream of, an OAW shall demonstrate in a permit application or in other documentation submitted to ADEQ that the regulated discharge will not degrade existing water quality in the downstream OAW.
4. A discharge regulated under a § 404 permit that may affect existing water quality of an OAW requires an individual § 401 water quality certification to ensure that existing water quality is maintained and protected and any water quality impacts are temporary. Temporary water quality impacts are those impacts that occur for a period of six months or less and are not regularly occurring.

D. Antidegradation review of a § 404 permit. The Director shall conduct the antidegradation review of any discharge authorized under a nationwide or regional § 404 permit as part of the § 401 water quality certification prior to issuance of the nationwide or regional permit. The Director shall conduct the antidegradation review of an individual § 404 permit if the discharge may degrade existing water quality in an OAW or a water listed on the 303(d) List of impaired waters. For regulated discharges that may degrade water quality in an OAW or a water that is on the 303(d) List of impaired waters, the Director shall conduct the antidegradation review as part of the § 401 water quality certification process.

E. Antidegradation review of an AZPDES stormwater permit. An individual stormwater permit for a municipal separate storm sewer system (MS4) meets antidegradation requirements if the permittee complies with the permit, including developing a stormwater management plan containing controls that reduce the level of pollutants in stormwater discharges to the maximum extent practicable.

F. Antidegradation review of a general permit. The Director shall conduct the antidegradation review of a regulated discharge authorized by a general permit at the time the general permit is issued or renewed. A person seeking authorization to discharge under a general permit is not required to undergo an individual antidegradation review at the time the Notice of Intent is submitted unless the discharge may degrade existing water quality in an OAW or a water listed on the 303(d) List of impaired waters.

R18-11-109. Numeric Water Quality Standards

A. *E. coli* bacteria. The following water quality standards for *Escherichia coli* (*E. coli*) are expressed in colony forming units per 100 milliliters of water (cfu / 100 ml) or as a Most Probable Number (MPN):

E. coli	**FBC**	**PBC**
Geometric mean (minimum of four samples in 30 days)	126	126
~~Single sample maximum~~Statistical threshold	~~235~~410	~~575~~576

value

B. pH. The following water quality standards for pH are expressed in standard units:

pH	DWS	FBC, PBC, A&W [1]	AgI	AgL
Maximum	9.0	9.0	9.0	9.0
Minimum	5.0	6.5	4.5	6.5

Footnotes:

1. "1" Includes A&Wc, A&Ww, A&Wedw, and A&We.

C. The maximum allowable increase in ambient water temperature, due to a thermal discharge is as follows:

A&Ww	A&Wedw	A&Wc
3.0° C	3.0° C	1.0° C

D. Suspended sediment concentration.

1. The following water quality standards for suspended sediment concentration, expressed in milligrams per liter (mg/L), are expressed as a median value determined from a minimum of four samples collected at least seven days apart:

A&Wc	A&Ww
25	80

2. The Director shall not use the results of a suspended sediment concentration sample collected during or within 48 hours after a local storm event to determine the median value.

E. Dissolved oxygen. A surface water meets the water quality standard for dissolved oxygen when either:

1. The percent saturation of dissolved oxygen is equal to or greater than 90 percent, or
2. The single sample minimum concentration for the designated use, as expressed in milligrams per liter (mg/L) is as follows:

Designated Use	Single sample minimum concentration

	in mg/L
A&Ww	6.0
A&Wc	7.0
A&W edw for a sample taken from three hours after sunrise to sunset	3.0
A&W edw for a sample taken from sunset to three hours after sunrise	1.0

The single sample minimum concentration is the same for the designated use in a lake, but the sample must be taken from a depth no greater than one meter.

F. Nutrient criteria. The following are water quality standards for total phosphorus and total nitrogen (expressed in milligrams per liter (mg/L)) that apply to the surface waters listed below. A minimum of 10 samples, each taken at least 10 days apart in a consecutive 12-month period, are required to determine a 90th percentile. Not more than 10 percent of the samples may exceed the 90th percentile value listed below. The Director will apply these water quality standards for total phosphorus and total nitrogen to ~~a~~ the surface ~~water~~ waters listed below, including to perennial tributaries, as listed.~~, and~~ The Director may also apply these total phosphorus and total nitrogen standards to any source discharging to ~~a~~ any tributary (ephemeral, intermittent, effluent dependent water, or perennial) of the surface waters listed below, if necessary to protect nutrient water quality in the listed surface water, based on the volume, frequency, magnitude and duration of the discharge, and distance to the downstream surface water listed below:

1. Verde River and its perennial tributaries from the Verde headwaters to Bartlett Lake:

Surface Water	Annual Mean	90th Percentile	Single Sample Maximum
Total	0.10	0.30	1.00

phosphorus			3.00
Total nitrogen	1.00	1.50	

2. Black River, Tonto Creek and their perennial tributaries for any segments that are not located on tribal lands:

Surface Water	Annual Mean	90th Percentile	Single Sample Maximum
Total phosphorus	0.10	0.20	0.80
Total nitrogen	0.50	1.00	2.00

3. Salt River and its perennial tributaries above Roosevelt Lake for any segments that are not located on tribal lands:

Surface Water	Annual Mean	90th Percentile	Single Sample Maximum
Total phosphorus	0.12	0.30	1.00
Total nitrogen	0.60	1.20	2.00

4. Salt River below Stewart Mountain Dam to its confluence with the Verde River:

Surface Water	Annual Mean	90th Percentile	Single Sample Maximum
Total phosphorus	0.05	–	0.20
Total	0.60	–	3.00

nitrogen

5. Little Colorado River and its perennial tributaries upstream from:
   a. The headwaters to River Reservoir,
   b. South Fork of Little Colorado River at 34°00’49”/109°24’18” to above South Fork Campground at 34°04’49”/109°24’18”, and
   c. The headwaters of Water Canyon Creek to the Apache-Sitgreaves National Forest boundary:

Surface Water	Annual Mean	90th Percentile	Single Sample Maximum
Total phosphorus	0.08	0.10	0.75
Total nitrogen	0.60	0.75	1.10

6. From the Little Colorado River and State Route 260 at 34°06’39”/109°18’55” to Lyman Lake:

Surface Water	Annual Mean	90th Percentile	Single Sample Maximum
Total phosphorus	0.20	0.30	0.75
Total nitrogen	0.70	1.20	1.50

7. Colorado River at the Northern International Boundary near Morelos Dam:

Surface Water	Annual Mean	90th Percentile	Single Sample Maximum
Total phosphorus	–	0.33	–
Total nitrogen	–	2.50	–

8. Oak Creek from its headwaters at 35°01'30"/111°44'12" to its confluence with the Verde River and the West Fork of Oak Creek from its headwaters at 35°02'44"/111°54'48" to its confluence with Oak Creek.

Surface Water	Annual Mean	90th Percentile	Single Sample Maximum
Total phosphorus	0.1	0.25	0.30
Total nitrogen	1.00	1.50	2.50

9. No discharge of wastewater to Show Low Creek or its perennial tributaries upstream of and including Fools Hollow Lake shall exceed 0.16 mg/L total phosphates as P.
10. No discharge of wastewater to the San Francisco River or its perennial tributaries upstream of Luna Lake Dam shall exceed 1.0 mg/L total phosphates as P.

~~**C.** Footnotes:~~

~~1. "1" Includes A&Wc, A&Ww, A&Wedw, and A&We.~~

R18-11-114. Mixing Zones

A. The Director may establish a mixing zone for a point source discharge to a surface water as a condition of an individual AZPDES permit on a pollutant-by-pollutant basis. A mixing zone is prohibited in an ephemeral water or where there is no water for dilution.

B. The owner or operator of a point source seeking the establishment of a mixing zone shall submit a request to the Director for a mixing zone as part of an application for an AZPDES permit. The request shall include:

1. An identification of the pollutant for which the mixing zone is requested;
2. A proposed outfall design;
3. A definition of the boundary of the proposed mixing zone. For purposes of this subsection, the boundary of a mixing zone ~~means the location~~ is where ~~the concentration of wastewater across a transect of the surface water differs by less than five percent~~ complete mixing occurs; and
4. A complete and detailed description of the existing physical, biological, and chemical conditions of the receiving water and the predicted impact of the proposed mixing zone on those conditions.

The description shall also address the factors listed in subsection (D) of this section that the Director must consider when deciding to grant or deny a request and shall address the mixing zone requirements in subsection (H) of this section.

~~C. The Director shall review the request for a mixing zone to determine whether the written request is complete. If the request is incomplete, the Director shall provide the applicant with a list of the additional information required.~~

~~D.~~C. The Director shall consider the following factors when deciding whether to grant or deny a request for a mixing zone:

1. The assimilative capacity of the receiving water;
2. The likelihood of adverse human health effects;
3. The location of drinking water plant intakes and public swimming areas;
4. The predicted exposure of biota and the likelihood that resident biota will be adversely affected;
5. Bioaccumulation;
6. Whether there will be acute toxicity in the mixing zone, and, if so, the size of the zone of initial dilution;
7. The known or predicted safe exposure levels for the pollutant for which the mixing zone is requested;
8. The size of the mixing zone;
9. The location of the mixing zone relative to biologically sensitive areas in the surface water;
10. The concentration gradient of the pollutant within the mixing zone;
11. Sediment deposition;
12. The potential for attracting aquatic life to the mixing zone; and
13. The cumulative impacts of other mixing zones and other discharges to the surface water.

~~E.~~D. Director determination.

1. The Director shall deny a request to establish a mixing zone if a water quality standard will be violated outside the boundaries of the proposed mixing zone. ~~The Director shall notify the owner or operator of the denial in writing and shall state the reason for the denial~~.
2. If the Director approves the request to establish a mixing zone, the Director shall establish the mixing zone as a condition of an AZPDES permit. The Director shall include any mixing zone condition in the AZPDES permit that is necessary to protect human health and the designated uses of the surface water.

~~F.~~E. Any person who is adversely affected by the Director's decision to grant or deny a request for a mixing zone may appeal the decision under A.R.S. § 49-321 et seq. and A.R.S. § 41-1092 et seq.

~~G.~~F. The Director shall reevaluate a mixing zone upon issuance, reissuance, or modification of the AZPDES permit for the point source or a modification of the outfall structure.

~~H.~~G. Mixing zone requirements.

1. ~~The length of a mixing zone shall not exceed 500 meters in a stream.~~ Mixing zones shall be as small as practicable.
2. The mixing zone shall not extend beyond the point in the waterbody at which complete mixing occurs under critical flow conditions of the discharge and critical flow conditions of the receiving water.
3. ~~2~~3. The total horizontal area allocated to all mixing zones on a lake shall not exceed 10 percent of the surface area of the lake.
4. ~~3~~4. Adjacent mixing zones in a lake shall not overlap or be located closer together than the greatest horizontal dimension of the largest mixing zone.
5. ~~4. A mixing zone shall provide for a zone of passage of not less than 50 percent of the cross-sectional area of a river or stream.~~
6. The design of any discharge outfall shall maximize initial dilution of the wastewater in a surface water.
7. The size of the zone of initial dilution in a mixing zone shall prevent lethality to organisms passing through the zone of initial dilution. The mixing zone shall prevent acute toxicity and lethality to organisms passing through the mixing zone.

~~I.~~H. The Director shall not establish a mixing zone in an AZPDES permit for the following persistent, bioaccumulative pollutants:

1. Chlordane,
2. DDT and its metabolites (DDD and DDE),
3. Dieldrin,
4. Dioxin,
5. Endrin,
6. Endrin aldehyde,
7. Heptachlor,
8. Heptachlor epoxide,
9. Lindane,
10. Mercury,
11. Polychlorinated biphenyls (PCBs), and
12. Toxaphene.

R18-11-115. Site-Specific Standards

A. The Director shall adopt a site-specific standard by rule.

B. The Director may adopt a site-specific standard based upon a request or upon the Director's initiative for any of the following reasons:

1. Local physical, chemical, or hydrological conditions of a surface water such as pH, hardness, fate and transport, or temperature alters the biological availability or toxicity of a pollutant;
2. The sensitivity of resident aquatic organisms that occur in a surface water to a pollutant differs from the sensitivity of the species used to derive the numeric water quality standards to protect aquatic life in Appendix A;
3. Resident aquatic organisms that occur in a surface water represent a narrower mix of species than those in the dataset used by ADEQ to derive numeric water quality standards to protect aquatic life in Appendix A;
4. The natural background concentration of a pollutant is greater than the numeric water quality standard to protect aquatic life prescribed in Appendix A. "Natural background" means the concentration of a pollutant in a surface water due only to non-anthropogenic sources; or
5. ~~Natural adaptive processes have enabled a viable, balanced population of aquatic life to exist in a surface water where the level of a pollutant is greater than the numeric water quality standard to protect aquatic life prescribed in Appendix A;or~~
6. ~~6.~~5. Other factors or combination of factors that upon review by the Director warrant changing a numeric water quality standard for a surface water.

C. Site-specific standard by request. To request that the Director adopt a site-specific standard, a person must conduct a study to support the development of a site-specific standard using a scientifically-defensible procedure.

1. Before conducting the study, a person shall submit a study outline to the Director for approval that contains the following elements:
   a. Identifies the pollutant;
   b. Describes the reach's boundaries;
   c. Uses one of the following procedures, as defined by the most recent EPA guidance documents:
      i. The recalculation procedure,
      ii. The water effects ratio for metals,
      iii. The streamlined water effects ratio, or
      iv. The Biotic ligand model.
   d. Demonstrates that all designated uses are protected.

2. Alternatively, a study outline submitted for the Director's approval must contain the following elements:
    a. Identifies the pollutant;
    b. Describes the reach's boundaries;
    c. Describes the hydrologic regime of the waterbody;
    d. Describes the scientifically-defensible procedure, which can include relevant aquatic life studies, ecological studies, laboratory tests, biological translators, fate and transport models, and risk analyses;
    e. Describes and compares the taxonomic composition, distribution and density of the aquatic biota within the reach to a reference reach and describes the basis of any major taxonomic differences;
    f. Describes the pollutant's effect on the affected species or appropriate surrogate species and on the other designated uses listed for the reach;
    g. Demonstrates that all designated uses are protected; and
    h. A person seeking to develop a site-specific standard based on natural background may use statistical or modeling approaches to determine natural background concentration. Modeling approaches include Better Assessment Science Integrating Source and Nonpoint Sources (Basins), Hydrologic Simulation Program-Fortran (HSPF), and Hydrologic Engineering Center (HEC) programs developed by the U.S. Army Corps of Engineers.

R18-11-120. Enforcement of Non-permitted Discharges

~~**A.** Any person who causes a violation of a water quality standard or any provision of this Article is subject to the enforcement provisions in A.R.S. Title 49, Chapter 2, Article 4.~~

~~**B.**~~**A.** ADEQ may establish a numeric water quality standard at a concentration that is below the practical quantitation limit. ~~In such cases,~~ Therefore, in enforcement actions pursuant to subsection (B) of this section, the water quality standard is enforceable at the practical quantitation limit.

~~**C.**~~**B.** ~~The~~ For non-permitted discharge violations, the Department shall determine compliance with acute aquatic and wildlife criteria from the analytical result of a grab sample. ~~Compliance~~ For non-permitted discharge violations, compliance with chronic aquatic and wildlife criteria shall be determined from the geometric mean of the analytical results of the last four samples taken at least 24 hours apart.

~~**D.** A person is not subject to penalties for violation of a water quality standard provided that the person is in compliance with the provisions of a compliance schedule issued under R18-11-121.~~

R18-11-122. Variances

A. The Director shall consider a variance from a water quality standard for a point source discharge if the discharger demonstrates that treatment more advanced than that required to comply with technology-based effluent limitations is necessary to comply with the water quality standard and:

1. It is not technically feasible to achieve compliance within the next five years,
2. The cost of the treatment would result in substantial and widespread economic and social impact, or
3. Human-caused conditions or sources of pollution prevent attainment of the water quality standard and cannot be remedied within the next five years.

B. If the Director grants a variance for a point source discharge:

1. The Director shall issue the variance for a fixed term not to exceed five years,
2. The variance shall apply only on a pollutant-specific basis. The point source discharge shall meet all other applicable water quality standards for which a variance is not granted, and

3. The variance shall not modify a water quality standard. Other point source discharges to the surface water shall meet applicable water quality standards.

C. Upon expiration of a variance, a point source discharger shall either comply with the water quality standard or apply for renewal of the variance. To renew a variance, the applicant shall demonstrate reasonable progress towards compliance with the water quality standard during the term of the variance.

D. The Director shall reevaluate a variance upon the issuance, reissuance, or modification of the AZPDES permit for the point source discharge.

E. A person who seeks a variance from a water quality standard shall submit a written request for a variance to the Director. A request for a variance shall include the following information:

1. Identification of the specific pollutant and water quality standard for which a variance is sought;
2. Identification of the receiving surface water;
3. For an existing point source discharge, a detailed description of the existing discharge control technologies that are used to achieve compliance with applicable water quality standards. For a new point source discharge, a detailed description of the proposed discharge control technologies that will be used to achieve compliance with applicable water quality standards;
4. Documentation that the existing or proposed discharge control technologies will comply with applicable technology-based effluent limitations and that more advanced treatment technology is necessary to achieve compliance with the water quality standard for which a variance is sought;
5. A detailed discussion of the reasons why compliance with the water quality standard cannot be achieved;
6. A detailed discussion of the discharge control technologies that are available for achieving compliance with the water quality standard for which a variance is sought;

7. Documentation of one of the following:
    a. That it is not technically feasible to install and operate any of the available discharge control technologies to achieve compliance with the water quality standard for which a variance is sought,
    b. That installation and operation of each of the available discharge technologies to achieve compliance with the water quality standard would result in substantial and widespread economic and social impact, or
    c. That human-caused conditions or sources of pollution prevent the attainment of the water quality standard for which the variance is sought and it is not possible to remedy the conditions or sources of pollution within the next five years,
8. Documentation that the point source discharger has reduced, to the maximum extent practicable, the discharge of the pollutant for which a variance is sought through implementation of a local pretreatment, source reduction, or waste minimization program; and

9. A detailed description of proposed interim discharge limitations that represent the highest level of treatment achievable by the point source discharger during the term of the variance.

F. The Director shall consider the following factors when deciding whether to grant or deny a variance request:

1. Bioaccumulation,
2. The predicted exposure of biota and the likelihood that resident biota will be adversely affected,
3. The known or predicted safe exposure levels for the pollutant for which the variance is requested, and
4. The likelihood of adverse human health effects.

G. The Director shall issue a public notice and provide an opportunity for a public hearing on whether the request for a variance should be granted or denied under A.A.C. R18-9-A907 and A.A.C. R18-9-A908. An interested party may request a public hearing on a variance under A.A.C. R18-9-A908(B).

H. Any variance granted by the Director is subject to review and approval by the Regional Administrator.

I. Any person who is adversely affected by a decision of the Director to grant or deny a variance and who has exercised any right to comment on the decision may appeal the decision under A.R.S. § 49-321 et seq. and A.R.S. § 41-1092 et seq.

J. The Director shall not grant a variance for a point source discharge to an OAW listed in R18-11-112(G).

A. Upon request, the Director may establish, by rule, a discharger-specific or water segment(s)-specific variance from a water quality standard for a point source discharge if requirements pursuant to this section are met.

B. A person who requests a variance must demonstrate all of the following information:

1. Identification of the specific pollutant and water quality standard for which a variance is sought.
2. Identification of the receiving surface water segment or segments to which the variance would apply.
3. A detailed discussion of the need for the variance, including the reasons why compliance with the water quality standard cannot be achieved over the term of the proposed variance, and any other useful information or analysis to evaluate attainability.
4. A detailed discussion of the discharge control technologies that are available for achieving compliance with the water quality standard for which a variance is sought.
5. Documentation that more advanced treatment technology than applicable technology-based effluent limitations is necessary to achieve compliance with the water quality standard for which a variance is sought.
6. A detailed description of proposed interim discharge limitations and pollutant control activities that represent the highest level of treatment achievable by a point source discharger or dischargers during the term of the variance.
7. Documentation that the proposed term is only as long as necessary to achieve the highest attainable condition.
8. Documentation that is appropriate to the type of use to which the variance would apply as follows:
    a. For a water quality standard variance to a use specified in Clean Water Act § 101(a)(2), documentation must include demonstration of at least one of the following factors that preclude attainment of the use during the term of the variance:
        i. Naturally occurring pollutant concentrations prevent attainment of the use;,
        ii. Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating state water conservation requirements to enable uses to be met;
        iii. That human-caused conditions or sources of pollution prevent the attainment of the water quality standard for which the variance is sought and either (i) it is not possible to remedy the conditions or sources of pollution or (ii) remedying the human-caused conditions would cause more environmental damage to correct than to leave in place;
        iv. Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification n a way that would result in the attainment of the use;

v. Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses;

vi. That installation and operation of each of the available discharge technologies more advanced than those required to comply with technology-based effluent limitations to achieve compliance with the water quality standard would result in substantial and widespread economic and social impact; or

vii. Actions necessary to facilitate lake, wetland, or stream restoration through dam removal or other significant reconfiguration activities preclude attainment of the designated use and criterion while the actions are being implemented.

b. For a water quality standard variance to a use other than those uses specified in Clean Water Act § 101(a)(2), documentation must justify how consideration and value of the water subject to the use appropriately supports the variance and term. A demonstration consistent with (B)(8)(a) of this section may be used to satisfy this requirement.

9. For a waterbody segment(s)-specific variance, the following information is required before the Director may issue a variance, in addition to all other required documentation pursuant to this section:

a. Identification and documentation of any cost-effective and reasonable best management practices for nonpoint source controls related to the pollutant(s) or water quality parameter(s) and water body or waterbody segment(s) specified in the variance that could be implemented to make progress towards attaining the underlying designated use and criterion; and

b. If any variance pursuant to (B)(9)(a) of this section previously applied to the water body or waterbody segment(s), documentation must also demonstrate whether and to what extent best management practices for nonpoint source controls were implemented to address the pollutant(s) or water quality parameter(s) subject to the water quality variance and the water quality progress achieved.

10. For a discharger-specific variance, the following information is required before the Director may issue a variance, in addition to all other required documentation pursuant to this section:

a. Identification of the permittee subject to the variance;

b. For an existing point source discharge, a detailed description of the existing discharge control technologies that are used to achieve compliance with applicable water quality standards. For a new point source discharge, a detailed description of the proposed discharge control technologies that will be used to achieve compliance with applicable water quality standards; and

c. Documentation that the existing or proposed discharge control technologies will comply with applicable technology-based effluent limitations.

C. The Director shall consider the following factors when deciding whether to grant or deny a variance request:

1. Bioaccumulation,
2. The predicted exposure of biota and the likelihood that resident biota will be adversely affected,
3. The known or predicted safe exposure levels for the pollutant for which the variance is requested, and
4. The likelihood of adverse human health effects.

D. The variance shall represent the highest attainable condition of the water body or water body segment applicable throughout the term of the variance.

E. A variance shall not result in any lowering of the currently attained ambient water quality, unless the variance is necessary for restoration activities, consistent with (B)(8)(a)(vii) of this section. The Director must specify the highest attainable condition of the water body or waterbody segment as a quantifiable expression of one of the following:

1. The highest attainable interim criterion,
2. The interim effluent condition that reflects the greatest pollutant reduction achievable; or
3. If no additional feasible pollutant control technology can be identified, the interim criterion or interim effluent condition that reflects the greatest pollutant reduction achievable with the pollutant control technologies installed at the time of the issuance of the variance, and the adoption and implementation of a Pollutant Minimization Program.

F. A variance shall not modify the underlying designated use and criterion. A variance is only a time limited exception to the underlying standard. For discharge-specific variances, other point source dischargers to the surface water that are not granted a variance shall still meet all applicable water quality standards.

G. Point source discharges shall meet all other applicable water quality standards for which a variance is not granted.

H. The Director may not grant a variance for a point source discharge to an OAW listed in R18-11-112(G).

I. Each variance established by the Director is subject to review and approval by the Regional Administrator.

J. The term of the water quality variance may only be as long as necessary to achieve the highest attainable condition and must be consistent with the supporting documentation in subsection (E) of this section. The variance term runs from the approval of the variance by the Regional Administrator.

K. The Director shall reevaluate, in its triennial review, whether each variance continues to represent the highest attainable condition. Comment on the variance shall be considered regarding whether the variance continues to represent the highest attainable condition. If the Director determines that the requirements of the variance do not represent the highest attainable condition, then the Director shall modify or repeal the variance in its triennial review rulemaking.

L. If the variance is modified during triennial review, the requirements of the variance shall represent the highest attainable condition at the time of initial adoption of the variance, or the highest attainable condition identified during the current reevaluation, whichever is more stringent.

M. Upon expiration of a variance, point source dischargers shall comply with the water quality standard.

N. The following are discharger-specific variances adopted by the Director:

1. [Reserved]

O. The following are water body and waterbody segment-specific variances adopted by the Director:

1. [Reserved]

Appendix A Numeric Water Quality Standards

Table 1 Water Quality Criteria By Designated Use (see f)

Parameter	CAS NUMBER	DWS (µg/L)	FC (µg/L)	FBC (µg/L)	PBC (µg/L)	A&Wc Acute (µg/L)	A&Wc Chronic (µg/L)	A&Ww Acute (µg/L)	A&Ww Chronic (µg/L)	A&Wedw Acute| (µg/L)	A&Wedw Chronic (µg/L)	A&We Acute (µg/L)	AgI (µg/L)	AgL (µg/L)
Acenaphthene	83329	420	198	56,000	56,000	850	550	850	550	850	550			
Cenaphthylene	208968	420		56,000	56,000									
Acrolein	107028	3.5	1.9	467	467	~~34~~ 3	~~30~~ 3	~~34~~ 3	~~30~~ 3	~~34~~ 3	~~30~~ 3	3		
Acrylonitrile	107131	~~0.06~~ 0.006	0.2	~~3~~ 9	37,333	3,800	250	3,800	250	3,800	250			
Alachlor	15972608	2		9,333	9,333	2,500	170	2,500	170	2,500	170			
Aldrin	309002	0.002	0.00005	~~0.08~~ 0.03	28	3		3		3		4.5	0.003	See (b)
Alpha Particles (Gross) Radioactivity		15 pCi/L See (h)												
Ammonia	7664417					See (e) & ~~Table 11~~ Tables 11 (present) & 14 (absent)	See (e) & ~~Table 12~~ Tables 13 (present) & 17 (absent)	See (e) & ~~Table 11~~ Tables 12 (present) & 15 (absent)	See (e) & ~~Table 12~~ Tables 13 (present) & 16 (absent)	See (e) & Table ~~11~~ 15 (absent)	See (e) & Table ~~12~~ 16 (absent)			
Anthracene	120127	2,100	74	280,000	280,000									
Antimony	7440360	6 T	640 T	747 T	747 T	88 D	30 D	88 D	30 D	1,000 D	600 D			
Arsenic	7440382	10 T	80 T	30 T	280 T	340 D	150 D	340 D	150 D	340 D	150 D	440 D	2,000 T	200 T
Asbestos	1332214	See (a)												
Atrazine	1912249	3		32,667	32,667									
Barium	7440393	2,000 T		~~98,000 T~~ 186667 T	~~98,000 T~~ 186667 T									
Benz(a)anthracene	56553	0.005	0.02	~~0.2~~ 0.6	0.2									
Benzene	71432	5	~~140~~ 114	~~93~~ 133	3,733	2,700	180	2,700	180	8,800	560			
3, 4 Benzfluoranthene	205992	0.005	~~0.02~~ 0.01	~~1.9~~ 47	~~1.9~~ 280									
Benzidine	92875	0.0002	0.0002	~~0.01~~ 0.02	2,800	1,300	89	1,300	89	1,300	89	10,000	0.01	0.01

Parameter	CAS NUMBER	DWS (µg/L)	FC (µg/L)	FBC (µg/L)	PBC (µg/L)	A&Wc Acute (µg/L)	A&Wc Chronic (µg/L)	A&Ww Acute (µg/L)	A&Ww Chronic (µg/L)	A&Wedw Acute| (µg/L)	A&Wedw Chronic (µg/L)	A&We Acute (µg/L)	AgI (µg/L)	AgL (µg/L)
Benzo(a)pyrene	50328	0.2	~~0.02~~ 0.01	~~0.2~~ 47	~~0.2~~ 280									
Benzo(k)fluoranthene	207089	0.005	~~0.02~~ 0.01	~~1.9~~ 47	~~1.9~~ 280									
Beryllium	7440417	4 T	84 T	1,867 T	1,867 T	65 D	5.3 D	65 D	5.3 D	65 D	5.3 D			
Beta particles and photon emitters		4 millirems /year See (i)												
Bis(2-chloroethoxy) methane	111911	21		2,800	2,800									
Bis(2-chloroethyl) ether	111444	0.03	0.5	~~1~~ 4	~~1~~ 4	120,000	6,700	120,000	6,700	120,000	6,700			
Bis(2-chloroisopropyl) ether	108601	280	3,441	37,333	37,333									
Bis(chloromethyl) ether	542881	0.00015		0.02										
Boron	7440428	1,400 T		186,667 T	186,667 T								1,000 T	
Bromodichloromethane	75274	TTHM See (g)	17	TTHM	18,667									
p-Bromodiphenyl ether	101553					180	14	180	14	180	14			
Bromoform	75252	TTHM See (g)	133	~~180~~ 591	18,667	15,000	10,000	15,000	10,000	15,000	10,000			
Bromomethane	74839	9.8	299	1,307	1,307	5,500	360	5,500	360	5,500	360			
Butyl benzyl phthalate	85687	1,400	386	186,667	186,667	1,700	130	1,700	130	1,700	130			
Cadmium	7440439	5 T	~~84 T~~ 6 T	~~700 T~~ 467 T	~~700 T~~ 467 T	~~See (d) & Table 2~~ See Table	~~See (d) & Table 3~~ See Table	~~See (d) & Table 2~~ See Table	~~See (d) & Table 3~~ See Table	~~See (d) & Table 2~~ See Table	~~See (d) & Table 3~~ See Table	~~See (d) & Table 2~~ See Table	50	50
Carbaryl	63252					2.1	2.1	2.1	2.1	2.1	2.1	2.1		
Carbofuran	1563662	40		4,667	4,667	650	50	650	50	650	50			
Carbon tetrachloride	56235	5	~~2~~ 3	~~11~~ 67	~~980~~ 3733	18,000	1,100	18,000	1,100	18,000	1,100			
Chlordane	57749	2	0.0008	~~4~~ 13	467	2.4	0.004	2.4	0.2	2.4	0.2	3.2		
Chlorine (total residual)	7782505	4,000		~~4,000~~ 93,333	~~4,000~~ 93,333	19	11	19	11	19	11			
Chlorobenzene	108907	100	1,553	18,667	18,667	3,800	260	3,800	260	3,800	260			
Chloroethane	75003	280		37,333	37,333									
2-Chloroethyl vinyl ether	110758					180,000	9,800	180,000	9,800	180,000	9,800			
Chloroform	67663	TTHM See (g)	~~470~~ 2,133	~~230~~ 9,333	9,333	14,000	900	14,000	900	14,000	900			
p-Chloro-m-cresol	59507					15	4.7	15	4.7	15	4.7	48,000		
Chloromethane	74873					270,000	15,000	270,000	15,000	270,000	15,000			
2-Chloronapthalene	91587	~~560~~ 2240	~~317~~ 1267	~~74,667~~ 298,667	~~74,667~~ 298,667									
2-Chlorophenol	95578	35	30	4,667	4,667	2,200	150	2,200	150	2,200	150			
Chloropyrifos	2921882	21	1.0	2,800	2,800	0.08	0.04	0.08	0.04	0.08	0.04			
Chromium III	16065831	10,500	75,000 T	1,400,000 T	1,400,000 T	See (d) & Table 4	See (d) & Table 4	See (d) & Table 4	See (d) & Table 4	See (d) & Table 4	See (d) & Table 4	See (d) & Table 4		
Chromium VI	18540299	21 T	150 T	2,800 T	2,800 T	16 D	11 D	16 D	11 D	16 D	11 D	34 D		
Chromium (Total)	7440473	100 T		100 T	100 T								1,000	1,000
Chrysene	218019	0.005	0.02	~~19~~ 0.6	~~19~~ 0.6									
Copper	7440508	1,300 T		1,300 T	1,300 T	See (d) & Table 5	See (d) & Table 5	See (d) & Table 5	See (d) & Table 5	See (d) & Table 5	See (d) & Table 5	See (d) & Table 5	5,000 T	500 T
Cyanide (as free cyanide)	57125	200 T	~~16,000 T~~ 504 T	~~18,667 T~~ 588 T	~~18,667 T~~ 588 T	22 T	5.2 T	41 T	9.7 T	41 T	9.7 T	84 T		200 T
Dalapon	75990	200	8,000	28,000	28,000									
DDT and its breakdown products		0.1	0.0003	14	467	101	0.001	1.1	0.001	1.1	0.001	1.1		

Parameter	CAS NUMBER	DWS (µg/L)	FC (µg/L)	FBC (µg/L)	PBC (µg/L)	A&Wc Acute (µg/L)	A&Wc Chronic (µg/L)	A&Ww Acute (µg/L)	A&Ww Chronic (µg/L)	A&Wedw Acute| (µg/L)	A&Wedw Chronic (µg/L)	A&We Acute (µg/L)	AgI (µg/L)	AgL (µg/L)
Dementon	806543						0.01		0.01		0.01			
Diazinon	333415					0.17	0.17	0.17	0.17	0.17	0.17	0.17		
Dibenz (ah) anthracene	53703	~~0.005~~ 0.350	0.02	~~1.9~~ 47.0	~~1.9~~ 280.0									
Dibromochloromethane	124481	TTHM See (g)	13	TTHM	18,667									
1,2-Dibromo-3-chloropro- pane	96128	0.2		2,800	2,800									
1,2-Dibromoethane	106934	~~0.05~~ 0.02		~~8,400~~ 2	8,400									
Dibutyl phthalate	84742	700	899	93,333	93,333	470	35	470	35	470	35	1,100		
1,2-Dichlorobenzene	95501	600	205	84,000	84,000	790	300	1,200	470	1,200	470	5,900		
1,3-Dichlorobenzene	541731					2,500	970	2,500	970	2,500	970			
1,4-Dichlorobenzene	106467	75		~~373,333~~ 373	~~373,333~~ 373	560	210	2,000	780	2,000	780	6,500		
3,3'-Dichlorobenzidine	91941	0.08	0.03	~~3~~ 10	~~3~~ 10									
~~p,p'-Dichlorodiphenyltrichloroethane (DDT) and metabolites (DDD) and (DDE)~~	~~50293~~	~~0.1~~	~~0.0002~~	~~4~~	~~467~~	~~1.1~~	~~0.001~~	~~1.1~~	~~0.001~~	~~1.1~~	~~0.001~~	~~1.1~~	~~0.001~~	~~0.001~~
1,2-Dichloroethane	107062	5	37	15	186,667	59,000	41,000	59,000	41,000	59,000	41,000			
1,1-Dichloroethylene	75354	7	7,143	46,667	46,667	15,000	950	15,000	950	15,000	950			
1,2-cis-Dichloroethylene	156592	70		~~70~~ 1867	~~70~~ 1867									
1,2-trans-Dichloroethylene	156605	100	10,127	18,667	18,667	68,000	3,900	68,000	3,900	68,000	3,900			
~~Parameter~~	~~CAS NUMBER~~	~~DWS (µg/L)~~	~~FC (µg/L)~~	~~FBC (µg/L)~~	~~PBC (µg/L)~~	~~A&Wc Acute (µg/L)~~	~~A&Wc Chronic (µg/L)~~	~~A&Ww Acute (µg/L)~~	~~A&Ww Chronic (µg/L)~~	~~A&Wedw Acute| (µg/L)~~	~~A&Wedw Chronic (µg/L)~~	~~A&We Acute (µg/L)~~	~~AgI (µg/L)~~	~~AgL (µg/L)~~
Dichloromethane	75092	5	~~593~~ 2,222	~~190~~ 2,333	~~56,000~~ 5,600	97,000	5,500	97,000	5,500	97,000	5,500			
2,4-Dichlorophenol	120832	21	59	2,800	2,800	1,000	88	1,000	88	1,000	88			
2,4-Dichlorophenoxyacetic acid (2,4-D)	94757	70		9,333	9,333									
1,2-Dichloropropane	78875	5	17,518	84,000	84,000	26,000	9,200	26,000	9,200	26,000	9,200			
1,3-Dichloropropene	542756	0.7	42	~~420~~ 93	28,000	3,000	1,100	3,000	1,100	3,000	1,100			
Dieldrin	60571	0.002	0.00005	~~0.09~~ 0.3	47	0.2	0.06	0.2	0.06	0.2	0.06	4	0.003	See (b)
Diethyl phthalate	84662	5,600	8,767	746,667	746,667	26,000	1,600	26,000	1,600	26,000	1,600			
Di (2-ethylhexyl) adipate	103231	400		~~560,000~~ 3,889	560,000									
Di (2-ethylhexyl) phthalate	117817	6	3	~~100~~ 333	18,667	400	360	400	360	400	360	3,100		
2,4-Dimethylphenol	105679	140	171	18,667	18,667	1,000	310	1,000	310	1,000	310	150,000		
Dimethyl phthalate	131113					17,000	1,000	17,000	1,000	17,000	1,000			
4,6-Dinitro-o-cresol	534521	~~28~~ 0.6	~~582~~ 12	~~3,733~~ 75	~~3,733~~ 75	310	24	310	24	310	24			
2,4-Dinitrophenol	51285	14	1,067	1,867	1,867	110	9.2	110	9.2	110	9.2			
2,4-Dinitrotoluene	121142	14	421	1,867	1,867	14,000	860	14,000	860	14,000	860			
2,6-Dinitrotoluene	606202	0.05		~~2~~ 7	~~3,733~~ 280									
Di-n-octyl phthalate	117840	~~2,800~~ 70		~~373,333~~ 9,333	~~373,333~~ 9,333									
Dinoseb	88857	7	12	~~933~~ 6	~~933~~ 6									
1,2-Diphenylhydrazine	122667	0.04	0.2	~~1.8~~ 6	~~1.8~~ 6	130	11	130	11	130	11			
Diquat	85007	20	176	2,053	2,053									
Endosulfan sulfate	1031078	42	18	5,600	5,600	0.2	0.06	0.2	0.06	0.2	0.06	3		
Endosulfan (Total)	115297	42	18	5,600	5,600	0.2	0.06	0.2	0.06	0.2	0.06	3		

Parameter	CAS NUMBER	DWS (µg/L)	FC (µg/L)	FBC (µg/L)	PBC (µg/L)	A&Wc Acute (µg/L)	A&Wc Chronic (µg/L)	A&Ww Acute (µg/L)	A&Ww Chronic (µg/L)	A&Wedw Acute| (µg/L)	A&Wedw Chronic (µg/L)	A&We Acute (µg/L)	AgI (µg/L)	AgL (µg/L)
Endothall	145733	100	16,000	18,667	18,667									
Endrin	72208	2	~~0.06~~ 0.2	~~280~~ 1120	~~280~~ 1120	0.09	0.04	0.09	0.04	0.09	0.04	0.7	0.004	0.004
Endrin aldehyde	7421933	2	.02	1120	1120	0.09	0.04	0.09	0.04	0.09	0.04	0.7		
Ethylbenzene	100414	700	2,133	93,333	93,333	23,000	1,400	23,000	1,400	23,000	1,400			
Fluoranthene	206440	280	28	37,333	37,333	2,000	1,600	2,000	1,600	2,000	1,600			
Fluorene	86737	280	1,067	37,333	37,333									
Fluoride	7782414	4,000		140,000	140,000									
Glyphosate	1071836	700	266,667	93,333	93,333									
Guthion	86500	21	92	2800	2800		0.01		0.01		0.01			
Heptachlor	76448	0.4	0.00008	~~0.4~~ 1	467	0.5	0.004	0.5	0.004	0.6	0.01	0.9		
Heptachlor epoxide	1024573	0.2	0.00004	~~0.2~~ 0.5	12	0.5	0.004	0.5	0.004	0.6	0.01	0.9		
Hexachlorobenzene	118741	1	0.0003	~~1~~ 3	747	6	3.7	6	3.7	6	3.7			
Hexachlorobutadiene	87683	0.4	18	~~18~~ 60	187	45	8.2	45	8.2	45	8.2			
Hexachlorocyclohexane alpha	319846	0.006	0.005	~~0.22~~ 0.7	7,467	1,600	130	1,600	130	1,600	130	1,600		
Hexachlorocyclohexane beta	319857	0.02	0.02	~~0.78~~ 3	560	1,600	130	1,600	130	1,600	130	1,600		
Hexachlorocyclohexane delta	319868					1,600	130	1,600	130	1,600	130	1,600		
Hexachlorocyclohexane gamma (lindane)	58899	0.2	~~1.8~~ 5	~~280~~ 700	~~280~~ 700	1	0.08	1	0.28	1	0.61	11		
Hexachlorocyclopenta di- ene	77474	50	~~580~~ 74	~~9,800~~ 11,200	~~9,800~~ 11,200	3.5	0.3	3.5	0.3	3.5	0.3			
Hexachloroethane	67721	~~2.5~~ 0.9	~~3.3~~ 1	~~100~~ 117	~~933~~ 653	490	350	490	350	490	350	850		
Hydrogen sulfide	7783064						2 See (c)		2 See (c)		2 See (c)			
Indeno (1,2,3-cd) pyrene	193395	~~0.05~~ 0.04	~~0.49~~ 1	~~1.9~~ 47	~~1.9~~ 47									
Iron	7439896						1,000 D		1,000 D		1,000 D			
Isophorone	78591	37	961	1,500	186,667	59,000	43,000	59,000	43,000	59,000	43,000			
Lead	7439971	15 T		15 T	15 T	See (d) & Table 6	See (d) & Table 6	See (d) & Table 6	See (d) & Table 6	See (d) & Table 6	See (d) & Table 6	See (d) & Table 6	10,000 T	100 T
Malathion	121755	140	103	18,667	18,667		0.1		0.1		0.1			
Manganese	7439965	980		130,667	130,667								10,000	
Mercury	7439976	2 T		280 T	280 T	2.4 D	0.01 D	2.4 D	0.01 D	2.4 D	0.01 D	5 D		10 T
Methoxychlor	72435	40		~~4,667~~ 18,667	~~4,667~~ 18,667		0.03		0.03		0.03			
Methylmercury	22967926		0.3 mg/ kg											
Mirex	2385855	1	0.1300	187	187		0.001		0.001		0.001			
Naphthalene	91203	140	1,524	18,667	18,667	1,100	210	3,200	580	3,200	580			
Nickel	7440020	~~140 T~~ 210 T	~~4,600 T~~ 511 T	28,000 T	28,000 T	See (d) & Table 7	See (d) & Table 7	See (d) & Table 7	See (d) & Table 7	See (d) & Table 7	See (d) & Table 7	See (d) & Table 7		
Nitrate	14797558	10,000		3,733,333	3,733,333									
Nitrite	14797650	1,000		233,333	233,333									
Nitrate + Nitrite		10,000												
Nitrobenzene	98953	~~3.5~~ 14	~~138~~ 554	~~467~~ 1867	~~467~~ 1867	1,300	850	1,300	850	1,300	850			
p-Nitrophenol	100027					4,100	3,000	4,100	3,000	4,100	3,000			
Nitrosodibutylamine	924163	0.006	0.2	0.9										
Nitrosodiethylamine	55185	0.0002	0.1	0.03										
N-nitrosodimethylamine	62759	0.001	3	~~0.03~~ 0.09	~~0.03~~ 0.09									
N-nitrosodi-n-	86306	7.1	6	~~290~~ 952	~~290~~ 952	2,900	200	2,900	200	2,900	200			

Parameter	CAS NUMBER	DWS (µg/L)	FC (µg/L)	FBC (µg/L)	PBC (µg/L)	A&Wc Acute (µg/L)	A&Wc Chronic (µg/L)	A&Ww Acute (µg/L)	A&Ww Chronic (µg/L)	A&Wedw Acute| (µg/L)	A&Wedw Chronic (µg/L)	A&We Acute (µg/L)	AgI (µg/L)	AgL (µg/L)
phenylamine														
N-nitrosodi-n-propylamine	621647	0.005	0.5	~~0.2~~ 0.7	~~88,667~~ 0.07									
N-nitrosopyrrolidine	930552	0.02	~~34~~	2										
Nonylphenol	104405					27.8	6.6	27.8	6.6	27.8	6.6	27.8		
Oxamyl	23135220	200	6452	23,333	23,333									
Parathion	56382	42	16	5,600	5,600	0.07	0.01	0.07	0.01	0.07	0.01			
Pentachlorobenzene	608935	6		747	747									
Paraquat	1910425	32	12,000	4,200	4,200	100	54	100	54	100	54			
Pentachlorophenol	87865	1	~~1,000~~ 111	12	~~28,000~~ 4,667	See (e), (j) & Table 10	See (e), (j) & Table 10	See (e), (j) & Table 10	See (e), (j) & Table 10	See (e), (j) & Table 10	See (e), (j) & Table 10	See (e), (j) & Table 10		
Permethrin	52645531	350	77	46,667	46,667	0.3	0.2	0.3	0.2	0.3	0.2			
~~Parameter~~	~~CAS NUMBER~~	~~DWS (µg/L)~~	~~FC (µg/L)~~	~~FBC (µg/L)~~	~~PBC (µg/L)~~	~~A&Wc Acute (µg/L)~~	~~A&Wc Chronic (µg/L)~~	~~A&Ww Acute (µg/L)~~	~~A&Ww Chronic (µg/L)~~	~~A&Wedw Acute| (µg/L)~~	~~A&Wedw Chronic (µg/L)~~	~~A&We Acute (µg/L)~~	~~AgI (µg/L)~~	~~AgL (µg/L)~~
Phenanthrene	85018					30	6.3	30	6.3	30	6.3			
Phenol	108952	2,100	37	280,000	280,000	5,100	730	7,000	1,000	7,000	1,000	180,000		
Picloram	1918021	500	~~2,710~~ 1806	65,333	65,333									
Polychlorinatedbiphenyls (PCBs)	1336363	0.5	0.00006	~~19~~ 2	19	2	0.01	2	0.02	2	0.02	11	0.001	0.001
Pyrene	129000	210	800	28,000	28,000									
Radium 226 + Radium 228		5 pCi/L												
Selenium	7782492	50 T	667 T	4,667 T	4,667 T		2 T		2 T		2 T	33 T	20 T	50 T
Silver	7440224	35 T	8,000 T	4,667 T	4,667 T	See (d) & Table 8		See (d) & Table 8		See (d) & Table 8		See (d) & Table 8		
Simazine	112349	4		4,667	4,667									
Strontium	7440246	8 pCi/L												
Styrene	100425	100		186,667	186,667	5,600	370	5,600	370	5,600	370			
Sulfides												100		
Tetrachlorobenzene, 1,2,4,5-	95943	2.1		280	280									
2,3,7,8-Tetrachlorod-ibenzo-p-dioxin (2,3,7,8-TCDD)	1746016	0.00003	~~5x10-9~~ 0.000000 1	~~0.00003~~ 0.0007	~~0.0009~~ 0.0007	0.01	0.005	0.01	0.005	0.01	0.005	0.1		
1,1,2,2-Tetrachloroethane	79345	0.2	~~4~~ 32,000	~~7~~ 23	~~56,000~~ 186,667	4,700	3,200	4,700	3,200	4,700	3,200			
Tetrachloroethylene	127184	5	~~261~~ 62	~~9,333~~ 2222	~~9,333~~ 5,600	2,600	280	6,500	680	6,500	680	15,000		
Thallium	7440280	2 T	~~7.2 T~~ 0.07 T	~~75 T~~ 9 T	~~75 T~~ 9 T	700 D	150 D	700 D	150 D	700 D	150 D			
Toluene	108883	1,000	~~201,000~~ 11,963	~~280,000~~ 149,333	~~280,000~~ 149,333	8,700	180	8,700	180	8,700	180			
Toxaphene	8001352	3	0.0003	~~1.3~~ 4	~~933~~ 1867	0.7	0.0002	0.7	0.0002	0.7	0.0002	11	0.005	0.005
~~Tributylin~~ Tributyltin	688733		0.08	280	280	0.5	0.07	0.5	0.07	0.5	0.07			
1,2,4-Trichlorobenzene	120821	70	70	9,333	9,333	750	130	1,700	300	1,700	300			
1,1,1-Trichloroethane	71556	200	~~428,571~~	1,866,667	1,866,667	2,600	1,600	2,600	1,600	2,600	1,600		1,000	

Parameter	CAS NUMBER	DWS (µg/L)	FC (µg/L)	FBC (µg/L)	PBC (µg/L)	A&Wc Acute (µg/L)	A&Wc Chronic (µg/L)	A&Ww Acute (µg/L)	A&Ww Chronic (µg/L)	A&Wedw Acute| (µg/L)	A&Wedw Chronic (µg/L)	A&We Acute (µg/L)	AgI (µg/L)	AgL (µg/L)
			285,714											
1,1,2-Trichloroethane	79005	5	16	~~25~~ 82	3,733	18,000	12,000	18,000	12,000	18,000	12,000			
Trichloroethylene	79016	5	~~29~~ 8	~~280,000~~ 101	~~280~~ 467	20,000	1,300	20,000	1,300	20,000	1,300			
Trichlorophenol, 2,4,5-	95954	700		93333	93333									
2,4,6-Trichlorophenol	88062	3.2	2	~~130~~ 424	~~130~~ 424	160	25	160	25	160	25	3,000		
2,4,5-Trichlorophenoxy proprionic acid (2,4,5-TP)	93721	50		~~7,467~~ 29,867	~~7,467~~ 29,867									
Trihalomethanes (T)		80												
Tritium	10028178	20,000 pCi/L												
Uranium	7440611	30 D		2,800	2,800									
Vinyl chloride	75014	2	5	~~2~~ 6	2,800									
Xylenes (T)	1330207	10,000		186,667	186,667									
Zinc	7440666	2,100 T	5,106 T	280,000 T	280,000 T	See (d) & Table 9	See (d) & Table 9	See (d) & Table 9	See (d) & Table 9	See (d) & Table 9	See (d) & Table 9	See (d) & Table 9	10,000 T	25,000 T
2-nitrophenol	88755		No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
1,1-dichloroethane	85343		No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
4-chlorophenyl phenyl ether	7005723		No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data
Benzo (ghi) perylene	191242		No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data	No Data

Footnotes

a. The asbestos standard is 7 million fibers (longer than 10 micrometers) per liter.

b. The aldrin/dieldrin standard is exceeded when the sum of the two compounds exceeds 0.003 µg/L.

c. In lakes, the acute criteria for hydrogen sulfide apply only to water samples taken from the epilimnion, or the upper layer of a lake or reservoir.

d. Hardness, expressed as mg/L $CaCO_3$, is determined according to the following criteria:

   i. If the receiving water body has an A&Wc or A&Ww designated use, then hardness is based on the hardness of the receiving water body from a sample taken at the same time that the sample for the metal is taken, except that the hardness may not exceed 400 mg/L $CaCO_3$.

   ii. If the receiving water has an A&Wedw or A&We designated use, then the hardness is based on the hardness of the effluent from a sample taken at the same time that the sample for the metal is taken, except that the hardness may not exceed 400 mg/L $CaCO_3$.

   iii. The mathematical equations for the hardness-dependent parameter represent the water quality standards. Examples of criteria for the hardness-dependent parameters have been calculated and are presented in separate tables at the end of Appendix A for the convenience of the user.

e. pH is determined according to the following criteria:

i. If the receiving water has an A&Wc or A&Ww designated use, then pH is based on the pH of the receiving water body from a sample taken at the same time that the sample for pentachlorophenol or ammonia is taken.

ii. If the receiving water body has an A&Wedw or A&We designated use, then the pH is based on the pH of the effluent from a sample taken at the same time that the sample for pentachlorophenol or ammonia is taken.

iii. The mathematical equations for ammonia represent the water quality standards. Examples of criteria for ammonia have been calculated and are presented in separate tables at the end of Appendix A for the convenience of the user.

f. Table 1 abbreviations.

i. µg/L = micrograms per liter,

ii. mg/kg = milligrams per kilogram,

iii. pCi/L = picocuries per liter,

iv. D = dissolved,

v. T = total recoverable,

vi. TTHM indicates that the chemical is a trihalomethane.

g. The total trihalomethane (TTHM) standard is exceeded when the sum of these four compounds exceeds 80 µg/L, as a rolling annual average.

h The concentration of gross alpha particle activity includes radium-226, but excludes radon and uranium.

i. The average annual concentration of beta particle activity and photon emitters from manmade radionuclides shall not produce an annual dose equivalent to the total body or any internal organ greater than four millirems per year.

j. The mathematical equations for the pH-dependent parameters represent the water quality standards. Examples of criteria for the pH-dependent parameters have been calculated and are presented in separate tables at the end of Appendix A for the convenience of the user.

k. Abbreviations for the mathematical equations are as follows:

e = the base of the natural logarithm and is a mathematical constant equal to 2.71828

LN = is the natural logarithm

CMC = Criterion Maximum Concentration (acute)

CCC= Criterion Continuous Concentration (chronic)

Table 2. Acute Water Quality Standards for Dissolved Cadmium

Aquatic and Wildlife coldwater		**Aquatic and Wildlife warmwater,**		**Aquatic and Wildlife ephemeral**

		and edw			
Hard. mg/L	**Std. µg/L**	**Hard. mg/L**	**Std. µg/L**	**Hard. mg/L**	**Std. µg/L.**
20	~~0.42~~ 0.40	20	~~0.74~~ 2.1	20	~~11.3~~ 4.9
100	~~2.0~~1.8	100	~~4.3~~ 9.4	100	~~64.6~~ 22
400	~~7.7~~6.5	400	~~19.1~~ 34	400	~~290~~ 80
~~e(1.0166*LN(Hardness) 3.924)*(1.136672-LN(Hardness)*0.041838)~~ e(0.9789*LN(Hardness)-3.866)*(1.136672-LN(Hardness)*0.041838)		~~e(1.128*LN(Hardness) 3.6867)*(1.136672-LN(Hardness)*0.041838)~~ e(0.9789*LN(Hardness)-2.208)*(1.136672-LN(Hardness)*0.041838)		~~e(1.128*LN(Hardness) 0.9691)*(1.136672-LN(Hardness)*0.041838)~~ e(0.9789*LN(Hardness)-1.363)*(1.136672-LN(Hardness)*0.041838)	

Table 3. Chronic Water Quality Standards for Dissolved Cadmium

Aquatic and Wildlife coldwater, warmwater, and edw			**~~Aquatic and Wildlife warmwater, and edw~~**	
Hard. mg/L	**Std. µg/L**		**~~Hard. mg/L~~**	**~~Std. µg/L~~**
20	~~0.08~~ 0.21		~~20~~	~~0.68~~
100	~~0.25~~ 0.72		~~100~~	~~2.2~~
400	~~0.64~~ 2.0		~~400~~	~~6.2~~
~~e(0.7409*LN(Hardness) 4.719)*(1.101672-LN(Hardness)*0.041838)~~ e(0.9789*LN(Hardness)-2.208)*(1.136672-LN(Hardness)*0.041838)			~~e(0.7852*LN(Hardness) 2.715)*(1.101672-LN(Hardness)*0.041838)~~	

Table 4. Water Quality Standards for Dissolved Chromium III

Acute Aquatic and Wildlife coldwater, warmwater and edw		**Chronic Aquatic and Wildlife coldwater, warmwater and edw**		**Acute Aquatic and Wildlife ephemeral**	
Hard. mg/L	**Std. µg/L**	**Hard. mg/L**	**Std. µg/L**	**Hard. mg/L**	**Std. µg/L**
20	152	20	~~19.8~~ 10.8	20	512
100	570	100	74.1	100	1912
400	1773	400	231	400	5950
$e^{(0.819*LN(Hardness)+3.7256)}*(0.316)$		$e^{(0.819*LN(Hardness)+0.6848)}*(0.86)$		$e^{(0.819*LN(Hardness)+4.9361)}*(0.316)$	

Table 5. Water Quality Standards for Dissolved Copper

Acute Aquatic and Wildlife coldwater, warmwater and edw		**Chronic Aquatic and Wildlife coldwater, warmwater and edw**		**Acute Aquatic and Wildlife ephemeral**	
Hard. mg/L	**Std. µg/L**	**Hard. mg/L**	**Std. µg/L**	**Hard. mg/L**	**Std. µg/L**
20	2.9	20	2.3	20	5.1
100	~~13.4~~ 13	100	9.0	100	~~23.3~~ 23
400	~~49.6~~ 50	400	~~29.3~~ 29	400	~~85.9~~ 86
$e^{(0.9422*LN(Hardness)-1.702)}*(0.96)$		$e^{(0.8545*LN(Hardness)-1.702)}*(0.96)$		$e^{(0.9422*LN(Hardness)-1.1514)}*(0.96)$	

Table 6. Water Quality Standards for Dissolved Lead

Acute Aquatic and Wildlife coldwater, warmwater and edw		Chronic Aquatic and Wildlife coldwater, warmwater and edw		Acute Aquatic and Wildlife ephemeral	
Hard. mg/L	**Std. µg/L**	**Hard. mg/L**	**Std. µg/L**	**Hard. mg/L**	**Std. µg/L**
20	10.8	20	~~0.4~~ 0.42	20	22.8
100	64.6	100	2.5	100	136.3
400	281	400	10.9	400	592.7
$e^{(1.273*LN(Hardness)-1.46)}*(1.46203-(LN(Hardness))*(0.145712))$		$e^{(1.273*LN(Hardness)-4.705)}*(1.46203-(LN(Hardness))*(0.145712))$		$e^{(1.273*(LN(Hardness))-0.7131)}*(1.46203-(LN(Hardness))*(0.145712))$	

~~**Table 11. Acute Criteria for Total Ammonia (in mg/L as N) Aquatic and Wildlife coldwater, warmwater, and edw**~~

~~pH~~	~~A&Wc~~	~~A&Ww and A&W edw~~
~~6.5~~	~~32.6~~	~~48.8~~
~~6.6~~	~~31.3~~	~~46.8~~
~~6.7~~	~~29.8~~	~~44.6~~
~~6.8~~	~~28.1~~	~~42.0~~
~~6.9~~	~~26.2~~	~~39.1~~
~~7.0~~	~~24.1~~	~~36.1~~
~~7.1~~	~~22.0~~	~~32.8~~
~~7.2~~	~~19.7~~	~~29.5~~
~~7.3~~	~~17.5~~	~~26.2~~
~~7.4~~	~~15.4~~	~~23.0~~
~~7.5~~	~~13.3~~	~~19.9~~
~~7.6~~	~~11.4~~	~~17.0~~
~~7.7~~	~~9.7~~	~~14.4~~
~~7.8~~	~~8.1~~	~~12.1~~
~~7.9~~	~~6.8~~	~~10.1~~
~~8.0~~	~~5.6~~	~~8.4~~
~~8.1~~	~~4.6~~	~~7.0~~
~~8.2~~	~~3.8~~	~~5.7~~
~~8.3~~	~~3.2~~	~~4.7~~
~~8.4~~	~~2.6~~	~~3.9~~
~~8.5~~	~~2.1~~	~~3.2~~
~~8.6~~	~~1.8~~	~~2.7~~
~~8.7~~	~~1.5~~	~~2.2~~
~~8.8~~	~~1.2~~	~~1.8~~
~~8.9~~	~~1.0~~	~~1.6~~

9.0	0.9					1.3				
Formula:	CMC	=	$\frac{0.275}{1+10^{7.204-pH}}$	+	$\frac{39.0}{1+10^{pH-7.204}}$	CMC	=	$\frac{0.411}{1+10^{7.204-pH}}$	+	$\frac{58.4}{1+10^{pH-7.204}}$

Table 11. Acute Standards for Total Ammonia (in mg/L, as N) for Aquatic and Wildlife coldwater, Unionid Mussels Present

	Temperature (°C)																	
pH	0-14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6.5	33	33	32	29	27	25	23	21	19	18	16	15	14	13	12	11	9.9
6.6	31	31	30	28	26	24	22	20	18	17	16	14	13	12	11	10	9.5
6.7	30	30	29	27	24	22	21	19	18	16	15	14	13	12	11	9.8	9
6.8	28	28	27	25	23	21	20	18	17	15	14	13	12	11	10	9.2	8.5
6.9	26	26	25	23	21	20	18	17	15	14	13	12	11	10	9.4	8.6	7.9
7	24	24	23	21	20	18	17	15	14	13	12	11	10	9.4	8.6	8	7.3
7.1	22	22	21	20	18	17	15	14	13	12	11	10	9.3	8.5	7.9	7.2	6.7
7.2	20	20	19	18	16	15	14	13	12	11	9.8	9.1	8.3	7.7	7.1	6.5	6
7.3	18	18	17	16	14	13	12	11	10	9.5	8.7	8	7.4	6.8	6.3	5.8	5.3
7.4	15	15	15	14	13	12	11	9.8	9	8.3	7.7	7	6.5	6	5.5	5.1	4.7
7.5	13	13	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
7.6	11	11	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	9.6	9.6	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	3
7.8	8.1	8.1	7.9	7.2	6.7	6.1	5.6	5.2	4.8	4.4	4	3.7	3.4	3.2	2.9	2.7	2.5
7.9	6.8	6.8	6.6	6	5.6	5.1	4.7	4.3	4	3.7	3.4	3.1	2.9	2.6	2.4	2.2	2.1
8	5.6	5.6	5.4	5	4.6	4.2	3.9	3.6	3.3	3	2.8	2.6	2.4	2.2	2	1.9	1.7
8.1	4.6	4.6	4.5	4.1	3.8	3.5	3.2	3	2.7	2.5	2.3	2.1	2	1.8	1.7	1.5	1.4
8.2	3.8	3.8	3.7	3.5	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	3.1	3.1	3.1	2.8	2.6	2.4	2.2	2	1.9	1.7	1.6	1.4	1.3	1.2	1.1	1	0.96
8.4	2.6	2.6	2.5	2.3	2.1	2	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1	0.93	0.86	0.79
8.5	2.1	2.1	2.1	1.9	1.8	1.6	1.5	1.4	1.3	1.2	1.1	0.98	0.9	0.83	0.77	0.71	0.65
8.6	1.8	1.8	1.7	1.6	1.5	1.3	1.2	1.1	1	0.96	0.88	0.81	0.75	0.69	0.63	0.59	0.54
8.7	1.5	1.5	1.4	1.3	1.2	1.1	1	0.94	0.87	0.8	0.74	0.68	0.62	0.57	0.53	0.49	0.45
8.8	1.2	1.2	1.2	1.1	1	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	1	1	0.93	0.85	0.79	0.72	0.67	0.61	0.56	0.52	0.48	0.44	0.4	0.37	0.34	0.32
9	0.88	0.88	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

$$MIN\left(\left(\frac{0.275}{1+10^{7.204-pH}}+\frac{39.0}{1+10^{pH-7.204}}\right)\left(0.7249\times\left(\frac{0.0114}{1+10^{7.204-pH}}+\frac{1.6181}{1+10^{pH-7.204}}\right)\times\left(23.12\times10^{0.036\times(20-T)}\right)\right)\right.$$

Table 12. Chronic Criteria for Total Ammonia (mg/L as N) Aquatic and Wildlife coldwater,

~~warmwater, and edw~~

	~~Temperature, °C~~									
~~pH~~	~~0~~	~~14~~	~~16~~	~~18~~	~~20 22~~		~~24~~	~~26~~	~~28~~	~~30~~
~~6.5~~	~~6.7~~	~~6.7~~	~~6.1~~	~~5.3~~	~~4.7~~	~~4.1~~	~~3.6~~	~~3.2~~	~~2.8~~	~~2.5~~
~~6.6~~	~~6.6~~	~~6.6~~	~~6.0~~	~~5.3~~	~~4.6~~	~~4.1~~	~~3.6~~	~~3.1~~	~~2.8~~	~~2.4~~
~~6.7~~	~~6.4~~	~~6.4~~	~~5.9~~	~~5.2~~	~~4.5~~	~~4.0~~	~~3.5~~	~~3.1~~	~~2.7~~	~~2.4~~
~~6.8~~	~~6.3~~	~~6.3~~	~~5.7~~	~~5.0~~	~~4.4~~	~~3.9~~	~~3.4~~	~~3.0~~	~~2.6~~	~~2.3~~
~~6.9~~	~~6.1~~	~~6.1~~	~~5.6~~	~~4.9~~	~~4.3~~	~~3.8~~	~~3.3~~	~~2.9~~	~~2.6~~	~~2.3~~
~~7.0~~	~~5.9~~	~~5.9~~	~~5.4~~	~~4.7~~	~~4.2~~	~~3.6~~	~~3.2~~	~~2.8~~	~~2.5~~	~~2.2~~
~~7.1~~	~~5.7~~	~~5.7~~	~~5.2~~	~~4.5~~	~~4.0~~	~~3.5~~	~~3.1~~	~~2.7~~	~~2.4~~	~~2.1~~
~~7.2~~	~~5.4~~	~~5.4~~	~~4.9~~	~~4.3~~	~~3.8~~	~~3.3~~	~~2.9~~	~~2.6~~	~~2.3~~	~~2.0~~
~~7.3~~	~~5.1~~	~~5.1~~	~~4.6~~	~~4.1~~	~~3.6~~	~~3.1~~	~~2.8~~	~~2.4~~	~~2.1~~	~~1.9~~
~~7.4~~	~~4.7~~	~~4.7~~	~~4.3~~	~~3.8~~	~~3.3~~	~~2.9~~	~~2.6~~	~~2.3~~	~~2.0~~	~~1.7~~
~~7.5~~	~~4.4~~	~~4.4~~	~~4.0~~	~~3.5~~	~~3.1~~	~~2.7~~	~~2.4~~	~~2.1~~	~~1.8~~	~~1.6~~
~~7.6~~	~~4.0~~	~~4.0~~	~~3.6~~	~~3.2~~	~~2.8~~	~~2.5~~	~~2.2~~	~~1.9~~	~~1.7~~	~~1.5~~
~~7.7~~	~~3.6~~	~~3.6~~	~~3.3~~	~~2.9~~	~~2.5~~	~~2.2~~	~~1.9~~	~~1.7~~	~~1.5~~	~~1.3~~
~~7.8~~	~~3.1~~	~~3.2~~	~~2.9~~	~~2.5~~	~~2.2~~	~~2.0~~	~~1.7~~	~~1.5~~	~~1.3~~	~~1.2~~
~~7.9~~	~~2.8~~	~~2.8~~	~~2.5~~	~~2.2~~	~~2.0~~	~~1.7~~	~~1.5~~	~~1.3~~	~~1.2~~	~~1.0~~
~~8.0~~	~~2.4~~	~~2.4~~	~~2.2~~	~~1.9~~	~~1.7~~	~~1.5~~	~~1.3~~	~~1.2~~	~~1.0~~	~~0.90~~
~~8.1~~	~~2.1~~	~~2.1~~	~~1.9~~	~~1.7~~	~~1.5~~	~~1.3~~	~~1.1~~	~~1.0~~	~~0.88~~	~~0.77~~
~~8.2~~	~~1.8~~	~~1.8~~	~~1.6~~	~~1.4~~	~~1.3~~	~~1.1~~	~~0.97~~	~~0.86~~	~~0.75~~	~~0.66~~
~~8.3~~	~~1.5~~	~~1.5~~	~~1.4~~	~~1.2~~	~~1.1~~	~~0.94~~	~~0.83~~	~~0.73~~	~~0.64~~	~~0.56~~
~~8.4~~	~~1.3~~	~~1.3~~	~~1.2~~	~~1.0~~	~~0.91~~	~~0.80~~	~~0.70~~	~~0.62~~	~~0.54~~	~~0.48~~
~~8.5~~	~~1.1~~	~~1.1~~	~~1.0~~	~~0.90~~	~~0.77~~	~~0.67~~	~~0.59~~	~~0.52~~	~~0.46~~	~~0.40~~
~~8.6~~	~~0.92~~	~~0.92~~	~~0.84~~	~~0.74~~	~~0.65~~	~~0.57~~	~~0.50~~	~~0.44~~	~~0.37~~	~~0.34~~
~~8.7~~	~~0.78~~	~~0.78~~	~~0.71~~	~~0.62~~	~~0.55~~	~~0.48~~	~~0.42~~	~~0.37~~	~~0.33~~	~~0.29~~
~~8.8~~	~~0.66~~	~~0.66~~	~~0.60~~	~~0.53~~	~~0.46~~	~~0.41~~	~~0.36~~	~~0.32~~	~~0.28~~	~~0.24~~
~~8.9~~	~~0.57~~	~~0.57~~	~~0.51~~	~~0.45~~	~~0.40~~	~~0.35~~	~~0.31~~	~~0.27~~	~~0.24~~	~~0.21~~
~~9.0~~	~~0.49~~	~~0.49~~	~~0.44~~	~~0.39~~	~~0.34~~	~~0.30~~	~~0.26~~	~~0.23~~	~~0.20~~	~~0.18~~

~~$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH}}\right) \cdot MIN\left(2.85, 1.45*10^{0.028\,(25-T)}\right)$$~~

Table 12. Acute Standards for Total Ammonia (in mg/L, as N) for Aquatic and Wildlife warmwater, Unionid Mussels Present

	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	
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	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	
7.3	27	26	24	22	20	18	17	16	14	13	12	11	10	9.5	8.7	8	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	8.3	7.7	7	6.5	6	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	
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	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	3	5.6	5.1	4.7	4.3	4	3.7	3.4	3.1	2.9	2.6	2.4	2.2	2.1	
8	8.8	8.2	7.6	7	6.4	5.9	5.4	5	4.6	4.2	3.9	3.6	3.3	3	2.8	2.6	2.4	2.2	2	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	2.7	2.5	2.3	2.1	2	1.8	1.7	1.5	1.4	
8.2	6	5.6	5.2	4.8	4.4	4	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	1.9	1.7	1.6	1.4	1.3	1.2	1.1	1	0.96	
8.4	4.1	3.8	3.5	3.2	3	2.7	2.5	2.3	2.1	2	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1	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	0.9	0.83	0.77	0.71	0.65	
8.6	2.8	2.6	2.4	2.2	2	1.9	1.7	1.6	1.5	1.3	1.2	1.1	1	0.96	0.88	0.81	0.75	0.69	0.63	0.58	0.54	
8.7	2.3	2.2	2	1.8	1.7	1.6	1.4	1.3	1.2	1.1	1	0.94	0.87	0.8	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	0.93	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	0.93	0.85	0.79	0.72	0.67	0.61	0.56	0.52	0.48	0.44	0.4	0.37	0.34	0.32	
9	1.4	1.3	1.2	1.1	1	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	

$$0.7249 \times \frac{0.0114}{1+10^{7.204-pH}} + \frac{1.6181}{1+10^{pH-7.204}} \times MIN(51.93, 23.12 \times 10^{0.036\times(20-T)})$$

~~**Table 13. Repealed**~~

Table 13. Chronic Criteria for Total Ammonia (in mg/L, as N) for Aquatic and Wildlife coldwater and warmwater, Unionid Mussels Present.

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	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	3.8	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.1	2	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	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	2.8	2.6	2.4	2.3	2.1	2	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	3.7	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.1	2	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1
7	4.4	4.1	3.8	3.6	3.4	3.2	3	2.8	2.6	2.4	2.3	2.2	2	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	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	0.95
7.2	4	3.7	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.1	2	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.1	1	0.96	0.9
7.3	3.8	3.5	3.3	3.1	2.9	2.7	2.6	2.4	2.2	2.1	2	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.1	1	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	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.1	1	0.96	0.9	0.85	0.79
7.5	3.2	3	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	0.95	0.89	0.83	0.78	0.73
7.6	2.9	2.8	2.6	2.4	2.3	2.1	2	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	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1	0.94	0.88	0.83	0.78	0.73	0.68	0.64	0.6
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	0.95	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	0.95	0.89	0.84	0.79	0.74	0.69	0.65	0.61	0.57	0.53	0.5	0.47
8	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1	0.94	0.88	0.83	0.78	0.73	0.68	0.64	0.6	0.56	0.53	0.5	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	0.4	0.38	0.35
8.2	1.3	1.2	1.2	1.1	1	0.96	0.9	0.84	0.79	0.74	0.7	0.65	0.61	0.57	0.54	0.5	0.47	0.44	0.42	0.39	0.37	0.34	0.32	0.3
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	0.4	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	0.5	0.47	0.44	0.41	0.39	0.36	0.34	0.32	0.3	0.28	0.26	0.25	0.23	0.22
8.5	0.8	0.75	0.71	0.67	0.62	0.58	0.55	0.51	0.48	0.45	0.42	0.4	0.37	0.35	0.33	0.31	0.29	0.27	0.25	0.24	0.22	0.21	0.2	0.18
8.6	0.68	0.64	0.6	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	0.2	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	0.3	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	0.4	0.38	0.35	0.33	0.31	0.29	0.27	0.26	0.24	0.23	0.21	0.2	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	0.3	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	0.1	0.09
9	0.36	0.34	0.32	0.3	0.28	0.26	0.24	0.23	0.21	0.2	0.19	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.11	0.1	0.09	0.09	0.08

$$0.8876 \times \left(\frac{0.0278}{1+10^{7.688-pH}} + \frac{1.1994}{1+10^{pH-7.688}}\right) \times \left(2.126 \times 10^{0.028\times(20-MAX(T,7))}\right)$$

~~Table 14. Repealed~~

Table 14. Acute Standards for Total Ammonia (in mg/L, as N) for Aquatic and Wildlife Coldwater, Unionid Mussels Absent.

Temperature (°C)																	
pH	0-14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6.5	33	33	33	33	33	33	33	33	33	33	33	33	33	33	31	29	27
6.6	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	28	26
6.7	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	26	24

6.8	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27	25	23
6.9	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	23	21
7	24	24	24	24	24	24	24	24	24	24	24	24	24	24	23	21	20
7.1	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	19	18
7.2	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	17	16
7.3	18	18	18	18	18	18	18	18	18	18	18	18	18	18	17	16	14
7.4	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	13
7.5	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	11
7.6	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	10	9.3
7.7	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.3	8.6	7.9
7.8	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	7.8	7.2	6.6
7.9	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.5	6	5.5
8	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.4	5	4.6
8.1	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.5	4.1	3.8
8.2	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.7	3.4	3.1
8.3	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3	2.8	2.6
8.4	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.3	2.1
8.5	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	1.9	1.8
8.6	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.7	1.6	1.4
8.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.3	1.2
8.8	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1
8.9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.92	0.85
9	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.85	0.78	0.72

$$MIN\left(\left(\frac{0.275}{1+10^{7.204-pH}}+\frac{39.0}{1+10^{pH-7.204}}\right)\left(0.7249\times\left(\frac{0.0114}{1+10^{7.204-pH}}+\frac{1.6181}{1+10^{pH-7.204}}\right)\times\left(62.15\times10^{0.036\times(20-T)}\right)\right)\right)$$

~~**Table 15. Repealed**~~

Table 15. Acute Standards for Total Ammonia (in mg/L, as N) for Aquatic and Wildlife Warmwater and Effluent Dependent, Unionid Mussels Absent.

Temperature (°C)																	
pH	0-14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6.5	51	51	51	51	51	51	51	51	51	48	44	40	37	34	31	29	27
6.6	49	49	49	49	49	49	49	49	49	46	42	39	36	33	30	28	26
6.7	46	46	46	46	46	46	46	46	46	43	40	37	34	31	29	26	24
6.8	44	44	44	44	44	44	44	44	44	41	38	35	32	29	27	25	23
6.9	41	41	41	41	41	41	41	41	41	38	35	32	30	27	25	23	21

7	38	38	38	38	38	38	38	38	38	35	32	30	27	25	23	21	20
7.1	34	34	34	34	34	34	34	34	34	32	29	27	25	23	21	19	18
7.2	31	31	31	31	31	31	31	31	31	29	26	24	22	21	19	17	16
7.3	27	27	27	27	27	27	27	27	27	26	23	22	20	18	17	16	14
7.4	24	24	24	24	24	24	24	24	24	22	21	19	17	16	15	14	13
7.5	21	21	21	21	21	21	21	21	21	19	18	16	15	14	13	12	11
7.6	18	18	18	18	18	18	18	18	18	17	15	14	13	12	11	10	9.3
7.7	15	15	15	15	15	15	15	15	15	14	13	12	11	10	9.3	8.6	7.9
7.8	13	13	13	13	13	13	13	13	13	12	11	10	9.2	8.5	7.8	7.2	6.6
7.9	11	11	11	11	11	11	11	11	11	9.9	9.1	8.4	7.7	7.1	6.5	6	5.5
8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.2	7.5	6.9	6.4	5.9	5.4	5	4.6
8.1	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	6.8	6.2	5.7	5.3	4.9	4.5	4.1	3.8
8.2	6	6	6	6	6	6	6	6	6	5.6	5.1	4.7	4.4	4	3.7	3.4	3.1
8.3	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.6	4.2	3.9	3.6	3.3	3	2.8	2.6
8.4	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	3.8	3.4	3.2	3	2.7	2.5	2.3	2.1
8.5	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.1	2.9	2.6	2.4	2.2	2.1	1.9	1.8
8.6	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.6	2.4	2.2	2	1.9	1.7	1.6	1.4
8.7	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2	1.8	1.7	1.5	1.4	1.3	1.2
8.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1
8.9	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.5	1.4	1.3	1.2	1.1	1	0.92	0.85
9	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.2	1.1	1	0.93	0.85	0.78	0.72

$$0.7249 \times \left(\frac{0.0114}{1+10^{7.204-pH}} + \frac{1.6181}{1+10^{pH-7.204}}\right) \times MIN\left(51.93, \left(62.15 \times 10^{0.036\times(20-T)}\right)\right)$$

~~**Table 16. Repealed**~~

Table 16. Chronic Standards for Total Ammonia (in mg/L, as N) for Aquatic and Wildlife Warmwater and Effluent Dependent, Unionid Mussels Absent.

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	19	17	16	15	14	13	13	12	11	10	9.7	9.1	8.5	8	7.5	7	6.6	6.2	5.8	5.4	5.1	4.8	4.5	4.2
6.6	18	17	16	15	14	13	12	12	11	10	9.6	9	8.4	7.9	7.4	6.9	6.5	6.1	5.7	5.4	5	4.7	4.4	4.1
6.7	18	17	16	15	14	13	12	11	11	10	9.4	8.8	8.3	7.7	7.3	6.8	6.4	6	5.6	5.3	4.9	4.6	4.3	4.1
6.8	17	16	15	14	14	13	12	11	10	9.8	9.2	8.6	8.1	7.6	7.1	6.7	6.2	5.8	5.5	5.1	4.8	4.5	4.2	4
6.9	17	16	15	14	13	12	12	11	10	9.5	8.9	8.4	7.8	7.4	6.9	6.5	6.1	5.7	5.3	5	4.7	4.4	4.1	3.9
7	16	15	14	14	13	12	11	10	9.8	9.2	8.6	8.1	7.6	7.1	6.7	6.2	5.9	5.5	5.1	4.8	4.5	4.2	4	3.7
7.1	16	15	14	13	12	11	11	10	9.4	8.8	8.3	7.7	7.3	6.8	6.4	6	5.6	5.3	4.9	4.6	4.3	4.1	3.8	3.6
7.2	15	14	13	12	12	11	10	9.5	9	8.4	7.9	7.4	6.9	6.5	6.1	5.7	5.3	5	4.7	4.4	4.1	3.9	3.6	3.4

7.3	14	13	12	12	11	10	9.6	9	8.4	7.9	7.4	6.9	6.5	6.1	5.7	5.4	5	4.7	4.4	4.1	3.9	3.6	3.4	3.2
7.4	13	12	12	11	10	9.5	9	8.4	7.9	7.4	6.9	6.5	6.1	5.7	5.3	5	4.7	4.4	4.1	3.9	3.6	3.4	3.2	3
7.5	12	11	11	10	9.4	8.8	8.2	7.7	7.2	6.8	6.4	6	5.6	5.2	4.9	4.6	4.3	4.1	3.8	3.6	3.3	3.1	2.9	2.8
7.6	11	10	10	9.1	8.5	8	7.5	7	6.6	6.2	5.8	5.4	5.1	4.8	4.5	4.2	3.9	3.7	3.5	3.2	3	2.9	2.7	2.5
7.7	9.9	9.3	8.7	8.1	7.7	7.2	6.8	6.3	5.9	5.6	5.2	4.9	4.6	4.3	4	3.8	3.5	3.3	3.1	2.9	2.7	2.6	2.4	2.3
7.8	8.8	8.3	7.8	7.3	6.8	6.4	6	5.6	5.3	5	4.6	4.4	4.1	3.8	3.6	3.4	3.2	3	2.8	2.6	2.4	2.3	2.1	2
7.9	7.8	7.3	6.8	6.4	6	5.6	5.3	5	4.6	4.4	4.1	3.8	3.6	3.4	3.2	3	2.8	2.6	2.4	2.3	2.1	2	1.9	1.8
8	6.8	6.3	6	5.6	5.2	4.9	4.6	4.3	4	3.8	3.6	3.3	3.1	2.9	2.7	2.6	2.4	2.3	2.1	2	1.9	1.7	1.6	1.5
8.1	5.8	5.5	5.1	4.8	4.5	4.2	4	3.7	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.1	2	1.8	1.7	1.6	1.5	1.4	1.3
8.2	5	4.7	4.4	4.1	3.9	3.6	3.4	3.2	3	2.8	2.6	2.5	2.3	2.2	2	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1
8.3	4.2	4	3.7	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.1	2	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1	0.96
8.4	3.6	3.4	3.2	3	2.8	2.6	2.4	2.3	2.1	2	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1	0.99	0.92	0.87	0.81
8.5	3	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	0.95	0.89	0.83	0.78	0.73	0.69
8.6	2.6	2.4	2.2	2.1	2	1.9	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.1	1	0.97	0.91	0.85	0.8	0.75	0.7	0.66	0.62	0.58
8.7	2.2	2	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1	0.93	0.88	0.82	0.77	0.72	0.68	0.63	0.6	0.56	0.52	0.49
8.8	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.1	1	0.96	0.9	0.85	0.79	0.74	0.7	0.65	0.61	0.58	0.54	0.51	0.47	0.44	0.42
8.9	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1	0.94	0.88	0.82	0.77	0.72	0.68	0.64	0.6	0.56	0.52	0.49	0.46	0.43	0.4	0.38	0.36
9	1.4	1.3	1.2	1.1	1	0.98	0.92	0.86	0.81	0.76	0.71	0.66	0.62	0.58	0.55	0.51	0.48	0.45	0.42	0.4	0.37	0.35	0.33	0.31

$$0.9405 \times \left(\frac{0.0278}{1+10^{7.688-pH}} + \frac{1.1994}{1+10^{pH-7.688}}\right) \times \left(7.547 \times 10^{0.028\times(20-MAX(T,7))}\right)$$

~~**Table 17. Repealed**~~

Table 17. Chronic Criteria for Total Ammonia (in mg/L, as N) for Aquatic and Wildlife coldwater, Unionid Mussels Absent.

Temperature (°C)																	
pH	0-14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6.5	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7	6.6	6.2	5.8	5.4	5.1	4.8	4.5	4.2
6.6	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	6.9	6.5	6.1	5.7	5.4	5	4.7	4.4	4.1
6.7	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	6.8	6.4	6	5.6	5.3	4.9	4.6	4.3	4.1
6.8	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.6	6.2	5.8	5.5	5.1	4.8	4.5	4.2	4
6.9	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.5	6.1	5.7	5.3	5	4.7	4.4	4.1	3.9
7	6.5	6.5	6.5	6.5	6.5	6.5	**6.5**	6.5	6.2	5.8	5.5	5.1	4.8	4.5	4.2	4	3.7
7.1	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6	5.6	5.3	4.9	4.6	4.3	4.1	3.8	3.6
7.2	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.7	5.3	5	4.7	4.4	4.1	3.9	3.6	3.4
7.3	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.4	5	4.7	4.4	4.1	3.9	3.6	3.4	3.2

7.4	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5	4.7	4.4	4.1	3.9	3.6	3.4	3.2	3
7.5	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.6	4.3	4.1	3.8	3.6	3.3	3.1	2.9	2.8
7.6	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.2	3.9	3.7	3.5	3.2	3	2.9	2.7	2.5
7.7	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.8	3.5	3.3	3.1	2.9	2.7	2.6	2.4	2.3
7.8	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.4	3.2	3	2.8	2.6	2.4	2.3	2.1	2
7.9	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3	2.8	2.6	2.4	2.3	2.1	2	1.9	1.8
8	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.6	2.4	2.3	2.1	2	1.9	1.7	1.6	1.5
8.1	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.2	2.1	1.9	1.8	1.7	1.6	1.5	1.4	1.3
8.2	2	2	2	2	2	2	2	2	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1
8.3	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1	0.96
8.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.2	1.1	1.1	0.99	0.93	0.87	0.81
8.5	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1	0.95	0.89	0.83	0.78	0.73	0.69
8.6	1	1	1	1	1	1	1	1	0.97	0.91	0.85	0.8	0.75	0.7	0.66	0.62	0.58
8.7	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.82	0.77	0.72	0.68	0.64	0.6	0.56	0.52	0.49
8.8	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.7	0.65	0.61	0.58	0.54	0.51	0.47	0.44	0.42
8.9	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.6	0.56	0.52	0.49	0.46	0.43	0.41	0.38	0.36
9	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.51	0.48	0.45	0.42	0.4	0.37	0.35	0.33	0.31

$$0.9405 \times \left(\frac{0.0278}{1+10^{7.688-pH}} + \frac{1.1994}{1+10^{pH-7.688}}\right) \times MIN\left(6.920, \left(7.547 \times 10^{0.028\times(20-T)}\right)\right)$$

Appendix B. Surface Waters and Designated Uses

(Coordinates are from the North American Datum of 1983 (NAD83). All latitudes in Arizona are north and all longitudes are west, but the negative signs are not included in the Appendix B table. Some web-based mapping systems require a negative sign before the longitude values to indicate it is a west longitude.)

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
BW	Alamo Lake	34°14'06"/113°35'00"	Deep		A&Ww			FBC			FC		AgL
BW	Big Sandy River	Headwaters to Alamo Lake			A&Ww			FBC			FC		AgL
BW	Bill Williams River	Alamo Lake to confluence with Colorado River			A&Ww			FBC			FC		AgL
BW	Blue Tank	34°40'14"/112°58'17"			A&Ww			FBC			FC		AgL
BW	Boulder Creek	Headwaters to confluence with unnamed tributary at 34°41'13"/113°03'37"		A&Wc				FBC			FC		AgL
BW	Boulder Creek	Below confluence with unnamed tributary to confluence with Burro Creek			A&Ww			FBC			FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
BW	Burro Creek (OAW)	Headwaters to confluence with Boulder Creek			A&Ww			FBC			FC		AgL
BW	Burro Creek	Below confluence with Boulder Creek to confluence with Big Sandy River			A&Ww			FBC			FC		AgL
BW	Carter Tank	34°52'27"/112°57'31"			A&Ww			FBC			FC		AgL
BW	Conger Creek	Headwaters to confluence with unnamed tributary at 34°45'15"/113°05'46"		A&Wc				FBC			FC		AgL
BW	Conger Creek	Below confluence with unnamed tributary to confluence with Burro Creek			A&Ww			FBC			FC		AgL
BW	Copper Basin Wash	Headwaters to confluence with unnamed tributary at 34°28'12"/112°35'33"		A&Wc				FBC			FC		AgL
BW	Copper Basin Wash	Below confluence with unnamed tributary to confluence with Skull Valley Wash				A&We			PBC				AgL
BW	Cottonwood Canyon	Headwaters to Bear Trap Spring		A&Wc				FBC			FC		AgL
BW	Cottonwood Canyon	Below Bear Trap Spring to confluence at ~~Smith Canyon~~			A&Ww			FBC			FC		AgL
BW	Date Creek	Headwaters to confluence with Santa Maria River			A&Ww			FBC			FC		AgL
BW	Francis Creek (OAW)	Headwaters to confluence with Burro Creek			A&Ww			FBC		DWS	FC	AgI	AgL
BW	Kirkland Creek	Headwaters to confluence with Santa Maria River			A&Ww			FBC			FC	AgI	AgL
BW	Knight Creek	Headwaters to confluence with Big Sandy River			A&Ww			FBC			FC		AgL
BW	Peeples Canyon (OAW)	Headwaters to confluence with Santa Maria River			A&Ww			FBC			FC		AgL
BW	Red Lake	35°12'18"/113°03'57"	Sedimentary		A&Ww			FBC			FC		AgL
BW	Santa Maria River	Headwaters to Alamo Lake			A&Ww			FBC			FC	AgI	AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
BW	Trout Creek	Headwaters to confluence with unnamed tributary at 35°06'47"/113°13'01"		A&Wc				FBC			FC		AgL
BW	Trout Creek	Below confluence with unnamed tributary to confluence with Knight Creek			A&Ww			FBC			FC		AgL
CG	Agate Canyon ~~Creek~~	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Beaver Dam Wash	Headwaters to confluence with the Virgin River			A&Ww			FBC			FC		AgL
CG	Big Springs Tank	36°36'08"/112°21'01"		A&Wc				FBC			FC		AgL
CG	Boucher Creek	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Bright Angel Creek	Headwaters to confluence with Roaring Springs Creek		A&Wc				FBC			FC		
CG	Bright Angel Creek	Below Roaring Spring Springs Creek to confluence with Colorado River			A&Ww			FBC			FC		
CG	Bright Angel Wash	Headwaters to Grand Canyon National Park South Rim WWTP outfall at 36°02'59"/112°09'02"				A&We			PBC				
CG	Bright Angel Wash (EDW)	Grand Canyon National Park South Rim WWTP outfall to Coconino Wash					A&Wedw		PBC				AgL
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
CG	Bulrush Canyon Wash	Headwaters to confluence with Kanab Creek				A&We			PBC				
CG	Cataract Creek	Headwaters to Santa Fe Reservoir		A&Wc				FBC		DWS	FC	AgI	AgL
CG	Cataract Creek	Santa Fe Reservoir to City of Williams WWTP outfall at 35°14'40"/112°11'18"		A&Wc				FBC			FC	AgI	AgL
CG	Cataract Creek (EDW)	City of Williams WWTP outfall to 1 km downstream					A&Wedw		PBC				

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
CG	Cataract Creek	Red Lake Wash to Havasupai Indian Reservation boundary				A&We			PBC				AgL
CG	Cataract Lake	35°15'04"/112°12'58"	Igneous	A&Wc									
CG	Chuar Creek	Headwaters to confluence with unnamed tributary at 36°11'35"/111°52'20"		A&Wc				FBC			FC		
CG	Chuar Creek	Below unnamed tributary to confluence with the Colorado River			A&Ww			FBC			FC		
CG	City Reservoir	35°13'57"/112°11'25"	Igneous	A&Wc				FBC		DWS	FC		
CG	Clear Creek	Headwaters to confluence with unnamed tributary at 36°07'33"/112°00'03"		A&Wc				FBC			FC		
CG	Clear Creek	Below confluence with unnamed tributary to confluence with Colorado River			A&Ww			FBC			FC		
CG	Coconino Wash (EDW)	South Grand Canyon Sanitary District Tusayan WRF outfall at 35°58'39"/112°08'25" to 1 km downstream					A&Wedw		PBC				
CG	Colorado River	Lake Powell to Lake Mead		A&Wc				FBC		DWS	FC	AgI	AgL
CG	Cottonwood Creek	Headwaters to confluence with unnamed tributary at 35°20'46"/113°35'31"		A&Wc				FBC			FC		AgL
CG	Cottonwood Creek	Below confluence with unnamed tributary to confluence with Colorado River			A&Ww			FBC			FC		AgL
CG	Crystal Creek	Headwaters to confluence with unnamed tributary at 36°13'41"/112°11'49"		A&Wc				FBC			FC		
CG	Crystal Creek	Below confluence with unnamed tributary to confluence with Colorado River			A&Ww			FBC			FC		
CG	Deer Creek	Headwaters to confluence with unnamed tributary at 36°26'15"/112°28'20"		A&Wc				FBC			FC		

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Edww	FBC	PBC	DWS	FC	AgI	AgL
CG	Deer Creek	Below confluence with unnamed tributary to confluence with Colorado River			A&Ww			FBC			FC		
CG	Detrital Wash	Headwaters to Lake Mead				A&We			PBC				
CG	Dogtown Reservoir	35°12'40"/112°07'54"	Igneous	A&Wc				FBC		DWS	FC	AgI	AgL
CG	Dragon Creek	Headwaters to confluence with Milk Creek		A&Wc				FBC			FC		
CG	Dragon Creek	Below confluence with Milk Creek to confluence with Crystal Creek			A&Ww			FBC			FC		
CG	Garden Creek	Headwaters to confluence with Pipe Creek			A&Ww			FBC			FC		
CG	Gonzalez Lake	35°15'26"/112°12'09"	Shallow		A&Ww			FBC			FC	AgI	AgL
CG	Grand Wash	Headwaters to ~~Lake Mead~~ Colorado River				A&We			PBC				
CG	Grapevine Creek	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Grapevine Wash	Headwaters to ~~Lake Mead~~ Colorado River				A&We			PBC				
CG	Hakatai Canyon ~~Creek~~	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Hance Creek	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Havasu Canyon Creek	From the Havasupai Indian Reservation boundary to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Hermit Creek	Headwaters to Hermit Pack Trail crossing at 36°03'38"/112°14'00"		A&Wc				FBC			FC		
CG	Hermit Creek	Below Hermit Pack Trail crossing to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Horn Creek	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Hualapai Wash	Headwaters to Lake Mead				A&We			PBC				
CG	Jacob Lake	36°42'27"/112°13'50"	Sedimentary	A&Wc				FBC			FC		

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
CG	Kaibab Lake	35°17'04"/112°09'32"	Igneous	A&Wc				FBC		DWS	FC	AgI	AgL
CG	Kanab Creek	Headwaters to confluence with the Colorado River			A&Ww			FBC		DWS	FC		AgL
CG	Kwagunt Creek	Headwaters to confluence with unnamed tributary at 36°13'37"/111°54'50"		A&Wc				FBC			FC		
CG	Kwagunt Creek	Below confluence with unnamed tributary to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Lake Mead	36°06'18"/114°26'33"	Deep	A&Wc				FBC		DWS	FC	AgI	AgL
CG	Lake Powell	36°59'53"/111°08'17"	Deep	A&Wc				FBC		DWS	FC	AgI	AgL
CG	Lonetree Canyon Creek	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Matkatamiba Creek	Below Havasupai Indian Reservation boundary to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Monument Creek	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
CG	Nankoweap Creek	Headwaters to confluence with unnamed tributary at 36°15'29"/111°57'26"		A&Wc				FBC			FC		
CG	Nankoweap Creek	Below confluence with unnamed tributary to confluence with Colorado River			A&Ww			FBC			FC		
CG	National Canyon Creek	Headwaters to Hualapai Indian Reservation boundary at 36°15'15"/112°52'34"			A&Ww			FBC			FC		
CG	North Canyon Creek	Headwaters to confluence with unnamed tributary at 36°33'58"/111°55'41"		A&Wc				FBC			FC		

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
CG	North Canyon Creek	Below confluence with unnamed tributary to confluence with Colorado River			A&Ww			FBC			FC		
CG	Olo ~~Creek~~ Canyon	Headwaters to confluence with the Colorado River						A&Ww					
CG	Parashant Canyon	Headwaters to confluence with unnamed tributary at 36°21'02"/113°27'56"		A&Wc				FBC			FC		
CG	Parashant Canyon	Below confluence with unnamed tributary to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Paria River	Utah border to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Phantom Creek	Headwaters to confluence with unnamed tributary at 36°09'29"/112°08'13"		A&Wc				FBC			FC		
CG	Phantom Creek	Below confluence with unnamed tributary to confluence with Bright Angel Creek			A&Ww			FBC			FC		
CG	Pipe Creek	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Red Canyon Creek	Headwaters to confluence with the Colorado River '			A&Ww			FBC			FC		
CG	Red Lake	35°40'03"/114°04'07"			A&Ww			FBC			FC		AgL
CG	Roaring Springs	36°11'45"/112°02'06"		A&Wc				FBC		DWS	FC		
CG	Roaring Springs Creek	Headwaters to confluence with Bright Angel Creek		A&Wc				FBC			FC		
CG	Rock Canyon	Headwaters to confluence with Truxton Wash				A&We			PBC				
CG	Royal Arch Creek	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Ruby Canyon ~~Creek~~	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Russell Tank	35°52'21"/111°52'45"		A&Wc				FBC			FC		AgL
CG	Saddle Canyon Creek	Headwaters to confluence with unnamed tributary at 36°21'36"/112°22'43"		A&Wc				FBC			FC		

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
CG	Saddle Canyon Creek	Below confluence with unnamed tributary to confluence with Colorado River			A&Ww			FBC			FC		
CG	Santa Fe Reservoir	35°14'31"/112°11'10"	Igneous	A&Wc				FBC		DWS	FC		
CG	Sapphire Canyon ~~Creek~~	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Serpentine Canyon ~~Creek~~	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Shinumo Creek	Headwaters to confluence with unnamed tributary at 36°18'18"/112°18'07"		A&Wc				FBC			FC		
CG	Shinumo Creek	Below confluence with unnamed tributary to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Short Creek	Headwaters to confluence with ~~the Virgin River~~ Fort Pearce Wash				A&We			PBC				
CG	Slate Creek	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Spring Canyon Creek	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Stone Creek	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Tapeats Creek	Headwaters to confluence with the Colorado River		A&Wc				FBC			FC		
CG	Thunder River	Headwaters to confluence with Tapeats Creek		A&Wc				FBC			FC		
CG	Trail Canyon Creek	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Transept Canyon	Headwaters to Grand Canyon National Park North Rim WWTP outfall at 36°12'20"/112°03'35"				A&We			PBC				
CG	Transept Canyon (EDW)	Grand Canyon National Park North Rim WWTP outfall to 1 km downstream					A&Wedw		PBC				

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
CG	Transept Canyon	From 1 km downstream of the Grand Canyon National Park North Rim WWTP outfall to confluence with Bright Angel Creek				A&We			PBC				
CG	Travertine Canyon Creek	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Truxton Wash	Headwaters to Red Lake				A&We			PBC				
CG	Turquoise Canyon ~~Creek~~	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Unkar Creek	Below confluence with unnamed tributary at 36°07'54"/111°54'06" to confluence with Colorado River			A&Ww			FBC			FC		
CG	Unnamed Wash (EDW)	Grand Canyon National Park Desert View WWTP outfall at 36°02'06"/111°49'13" to confluence with Cedar Canyon					A&Wedww		PBC				
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
CG	Unnamed Wash (EDW)	Valle Airpark WRF outfall at 35°38'34"/112°09'22" to confluence with Spring Valley Wash					A&Wedw		PBC				
CG	Vasey's Paradise	A spring at 36°29'52"/111°51'26"		A&Wc				FBC			FC		
CG	Virgin River	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC	AgI	AgL
CG	Vishnu Creek	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Warm Springs Creek	Headwaters to confluence with the Colorado River			A&Ww			FBC			FC		
CG	West Cataract Creek	Headwaters to confluence with Cataract Creek		A&Wc									
CG	White Creek	Headwaters to confluence with unnamed tributary at 36°18'45"/112°21'03"		A&Wc				FBC			FC		

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
CG	White Creek	Below confluence with unnamed tributary to confluence with the Colorado River			A&Ww			FBC			FC		
CG	Wright Canyon Creek	Headwaters to confluence with unnamed tributary at 35°20'48"/113°30'40"		A&Wc				FBC			FC		AgL
CG	Wright Canyon Creek	Below confluence with unnamed tributary to confluence with Truxton Wash			A&Ww			FBC			FC		AgL
CL	A10 Backwater	33°31'45"/114°33'19"	Shallow		A&Ww			FBC			FC		
CL	A7 Backwater	33°34'27"/114°32'04"	Shallow		A&Ww			FBC			FC		
CL	Adobe Lake	33°02'36"/114°39'26"	Shallow		A&Ww			FBC			FC		
CL	Cibola Lake	33°14'01"/114°40'31"	Shallow		A&Ww			FBC			FC		
CL	Clear Lake	33°01'59"/114°31'19"	Shallow		A&Ww			FBC			FC		
CL	Columbus Wash	Headwaters to confluence with the Gila River				A&We			PBC				
CL	Colorado River	Lake Mead to Topock Marsh		A&Wc				FBC		DWS	FC	AgI	AgL
CL	Colorado River	Topock Marsh to Morelos Dam			A&Ww			FBC		DWS	FC	AgI	AgL
CL	Gila River	Painted Rock Dam to confluence with the Colorado River			A&Ww			FBC			FC	AgI	AgL
CL	Holy Moses Wash	Headwaters to City of Kingman Downtown WWTP outfall at 35°10'33"/114°03'46"				A&We			PBC				
CL	Holy Moses Wash (EDW)	City of Kingman Downtown WWTP outfall to 3 km downstream					A&Wedw		PBC				
CL	Holy Moses Wash	From 3 km downstream of City of Kingman Downtown WWTP outfall to confluence with Sawmill Wash				A&We			PBC				
CL	Hunter's Hole Backwater	32°31'13"/114°48'07"	Shallow		A&Ww			FBC			FC		AgL
CL	Imperial Reservoir	32°53'02"/114°27'54"	Shallow		A&Ww			FBC		DWS	FC	AgI	AgL
CL	Island Lake	33°01'44"/114°36'42"	Shallow		A&Ww			FBC			FC		

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
CL	Laguna Reservoir	32°51'35"/114°28'29"	Shallow		A&Ww			FBC		DWS	FC	AgI	AgL
CL	Lake Havasu	34°35'18"/114°25'47"	Deep		A&Ww			FBC		DWS	FC	AgI	AgL
CL	Lake Mohave	35°26'58"/114°38'30"	Deep	A&Wc				FBC		DWS	FC	AgI	AgL
CL	Martinez Lake	32°58'49"/114°28'09"	Shallow		A&Www			FBC			FC	AgI	AgL
CL	Mittry Lake	32°49'17"/114°27'54"	Shallow		A&Www			FBC			FC		
CL	Mohave Wash	Headwaters ~~to Lake Havasu~~ to Lower Colorado River				A&We			PBC				
CL	Nortons Lake	33°02'30"/114°37'59"	Shallow		A&Www			FBC			FC		
CL	Painted Rock (Borrow Pit) Lake	33°04'55"/113°01'17"	Sedimentary		A&Www			FBC			FC	AgI	AgL
~~CL~~	~~Pretty Water Lake~~	~~33°19'51"/114°42'19"~~	~~Shallow~~		~~A&Ww~~			~~FBC~~			~~FC~~		
CL	Quigley Ponds	32°43'40"/113°57'44"	Shallow		A&Www			FBC			FC		
CL	Redondo Lake	32°44'32"/114°29'03"	Shallow		A&Www			FBC			FC		
CL	Sacramento Wash	Headwaters to Topock Marsh				A&We			PBC				
CL	Sawmill Canyon	Headwaters to abandoned gaging station at 35°09'45"/113°57'56"			A&Www			FBC			FC		AgL
CL	Sawmill Canyon	Below abandoned gaging station to confluence with Holy Moses Wash				A&We			PBC				AgL
CL	Topock Marsh	34°43'27"/114°28'59"	Shallow		A&Www			FBC		DWS	FC	AgI	AgL
CL	Tyson Wash (EDW)	Town of Quartzsite WWTP outfall at 33°42'39"/ 114°13'10" to 1 km downstream					A&Wedw		PBC				
CL	Wellton Canal	Wellton-Mohawk Irrigation District								DWS		AgI	AgL
CL	Wellton Ponds	32°40'32"/114°00'26"			A&Ww			FBC			FC		
CL	~~YPG~~ Yuma Proving Ground Pond	32°50'58"/114°26'14"			A&Www			FBC			FC		

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
CL	Yuma Area Canals	Above municipal water treatment plant intakes								DWS		AgI	AgL
CL	Yuma Area Canals	Below municipal water treatment plant intakes and all drains										AgI	AgL
LC	Als Lake	35°02'10"/111°25'17"	Igneous		A&Ww			FBC			FC		AgL
LC	Ashurst Lake	35°01'06"/111°24'18"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Atcheson Reservoir	33°59'59"/109°20'43"	Igneous		A&Ww			FBC			FC	AgI	AgL
LC	Auger Creek	Headwaters to confluence with Nutrioso Creek		A&Wc				FBC			FC		AgL
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
LC	Barbershop Canyon Creek	Headwaters to confluence with East Clear Creek		A&Wc				FBC			FC		AgL
LC	Bear Canyon Creek	Headwaters to confluence with General Springs Canyon		A&Wc				FBC			FC		AgL
LC	Bear Canyon Creek	Headwaters to confluence with Willow Creek		A&Wc				FBC			FC		AgL
LC	Bear Canyon Lake	34°24'00"/111°00'06"	Sedimentary	A&Wc				FBC			FC	AgI	AgL
LC	Becker Lake	34°09'11"/109°18'23"	Shallow	A&Wc				FBC			FC		AgL
LC	Billy Creek	Headwaters to confluence with Show Low Creek		A&Wc									
LC	Black Canyon ~~Creek~~	Headwaters to confluence with Chevelon Creek		A&Wc				FBC			FC	AgI	AgL
LC	Black Canyon Lake	34°20'32"/110°40'13"	Sedimentary	A&Wc				FBC		DWS	FC	AgI	AgL
~~LC~~	~~Blue Ridge Reservoir~~	~~34°32'40"/111°11'33"~~	~~Deep~~	~~A&Wc~~				~~FBC~~			~~FC~~	~~AgI~~	~~AgL~~
LC	Boot Lake	34°58'54"/111°20'11"	Igneous	A&Wc				FBC			FC		AgL
LC	Bow and Arrow Wash	Headwaters to confluence with Rio de Flag				A&We			PBC				

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Edww	FBC	PBC	DWS	FC	AgI	AgL
LC	Buck Springs Canyon Creek	Headwaters to confluence with Leonard Canyon Creek		A&Wc				FBC			FC		AgL
LC	Bunch Reservoir	34°02'20"/109°26'48"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Camillo Tank	34°55'03"/111°22'40"	Igneous		A&Ww			FBC			FC		AgL
LC	Carnero Lake	34°06'57"/109°31'42"	Shallow	A&Wc				FBC			FC		AgL
LC	Chevelon Canyon Lake	34°29'18"/110°49'30"	Sedimentary	A&Wc				FBC			FC	AgI	AgL
LC	Chevelon Creek	Headwaters to confluence with the Little Colorado River		A&Wc				FBC			FC	AgI	AgL
LC	Chevelon Creek, West Fork	Headwaters to confluence with Chevelon Creek		A&Wc				FBC			FC		AgL
LC	Chilson Tank	34°51'43"/111°22'54"	Igneous		A&Ww			FBC			FC		AgL
LC	Clear Creek	Headwaters to confluence with the Little Colorado River		A&Wc				FBC		DWS	FC		AgL
LC	Clear Creek Reservoir	34°57'09"/110°39'14"	Shallow	A&Wc				FBC		DWS	FC	AgI	AgL
LC	Coconino Reservoir	35°00'05"/111°24'10"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Colter Creek	Headwaters to confluence with Nutrioso Creek		A&Wc				FBC			FC		AgL
LC	Colter Reservoir	33°56'39"/109°28'53"	Shallow	A&Wc				FBC			FC		AgL
LC	Concho Creek	Headwaters to confluence with Carrizo Wash		A&Wc				FBC			FC		AgL
LC	Concho Lake	34°26'37"/109°37'40"	Shallow	A&Wc				FBC			FC	AgI	AgL
LC	Cow Lake	34°53'14"/111°18'51"	Igneous		A&Ww			FBC			FC		AgL
LC	Coyote Creek	Headwaters to confluence with the Little Colorado River		A&Wc				FBC			FC	AgI	AgL
LC	Cragin Reservoir (formerly Blue Ridge Reservoir)	34°32'40"/111°11'33"	Deep	A&Wc				FBC			FC	AgI	AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
LC	Crisis Lake (Snake Tank #2)	34°47'51"/111°17'32"			A&Ww			FBC			FC		AgL
LC	Dane Canyon Creek	Headwaters to confluence with Barbershop Canyon Creek		A&Wc				FBC			FC		AgL
LC	Daves Tank	34°44'22"/111°17'15"			A&Ww			FBC			FC		AgL
LC	Deep Lake	35°03'34"/111°25'00"	Igneous		A&Ww			FBC			FC		AgL
LC	Dry Lake (EDW)	34°38'02"/110°23'40"	EDW				A&Wedw		PBC				
LC	Ducksnest Lake	34°59'14"/111°23'57"			A&Ww			FBC			FC		AgL
LC	East Clear Creek	Headwaters to confluence with Clear Creek		A&Wc				FBC			FC	AgI	AgL
LC	Ellis Wiltbank Reservoir	34°05'25"/109°28'25"	Igneous		A&Ww			FBC			FC	AgI	AgL
LC	Estates at Pine Canyon lakes (EDW)	35°09'32"/111°38'26"	EDW				A&Wedw		PBC				
LC	Fish Creek	Headwaters to confluence with the Little Colorado River		A&Wc				FBC			FC		AgL
LC	Fool's Hollow Lake	34°16'30"/110°03'43"	Igneous	A&Wc				FBC			FC		AgL
LC	General Springs Canyon Creek	Headwaters to confluence with East Clear Creek		A&Wc				FBC			FC		AgL
LC	Geneva Reservoir	34°01'45"/109°31'46"	Igneous		A&Ww			FBC			FC		AgL
LC	Hall Creek	Headwaters to confluence with the Little Colorado River		A&Wc				FBC			FC	AgI	AgL
LC	Hart Canyon Creek	Headwaters to confluence with Willow Creek		A&Wc				FBC			FC		AgL
LC	Hay Lake	34°00'11"/109°25'57"	Igneous	A&Wc				FBC			FC		AgL
LC	Hog Wallow Lake	33°58'57"/109°25'39"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Horse Lake	35°03'55"/111°27'50"			A&Ww			FBC			FC		AgL
LC	Hulsey Creek	Headwaters to confluence with Nutrioso Creek		A&Wc				FBC			FC		AgL
LC	Hulsey Lake	33°55'58"/109°09'40"	Sedimentary	A&Wc				FBC			FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
LC	Indian Lake	35°00'39"/111°22'41"			A&Ww			FBC			FC		AgL
LC	Jack's Canyon Creek	Headwaters to confluence with the Little Colorado River		A&Wc				FBC			FC	AgI	AgL
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
LC	Jarvis Lake	33°58'59"/109°12'36"	Sedimentary		A&Ww			FBC			FC		AgL
LC	Kinnikinick Lake	34°53'53"/111°18'18"	Igneous	A&Wc				FBC			FC		AgL
LC	Knoll Lake	34°25'38"/111°05'13"	Sedimentary	A&Wc				FBC			FC		AgL
LC	Lake Humphreys (EDW)	35°11'51"/111°35'19"	EDW				A&Wedw		PBC				
LC	Lake Mary, Lower	35°06'21"/111°34'38"	Igneous	A&Wc				FBC		DWS	FC		AgL
LC	Lake Mary, Upper	35°03'23"/111°28'34"	Igneous	A&Wc				FBC		DWS	FC		AgL
LC	Lake of the Woods	34°09'40"/109°58'47"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Lee Valley Creek (OAW)	Headwaters to Lee Valley Reservoir		A&Wc				FBC			FC		
LC	Lee Valley Creek	From Lee Valley Reservoir to confluence with the East Fork of the Little Colorado River		A&Wc									
LC	Lee Valley Reservoir	33°56'29"/109°30'04"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Leonard Canyon Creek	Headwaters to confluence with Clear Creek		A&Wc				FBC			FC		AgL
LC	Leonard Canyon Creek, East Fork	Headwaters to confluence with Leonard Canyon Creek		A&Wc				FBC			FC		AgL
LC	Leonard Canyon Creek, Middle Fork	Headwaters to confluence with Leonard Canyon, West Fork		A&Wc				FBC			FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
LC	Leonard Canyon Creek, West Fork	Headwaters to confluence with Leonard Canyon, East Fork		A&Wc				FBC			FC		AgL
LC	Lily Creek	Headwaters to confluence with Coyote Creek		A&Wc				FBC			FC		AgL
LC	Little Colorado River	Headwaters to Lyman Reservoir		A&Wc				FBC			FC	AgI	AgL
LC	Little Colorado River	Below Lyman Reservoir to confluence with the Puerco River		A&Wc				FBC		DWS	FC	AgI	AgL
LC	Little Colorado River	~~Below confluence with the Puerco River to the Navajo Nation Reservation boundary~~ Below Puerco River confluence to the Colorado River, excluding segments on Native American Lands			A&Ww			FBC		DWS	FC	AgI	AgL
LC	Little Colorado River, East Fork	Headwaters to confluence with the Little Colorado River		A&Wc				FBC			FC		AgL
LC	Little Colorado River, South Fork	Headwaters to confluence with the Little Colorado River		A&Wc				FBC			FC		AgL
LC	Little Colorado River, West Fork (OAW)	Headwaters to Government Springs		A&Wc				FBC			FC		
LC	Little Colorado River, West Fork	Below Government Springs to confluence with the Little Colorado River		A&Wc				FBC			FC		AgL
LC	Little George Reservoir	34°00'37"/109°19'15"	Igneous		A&Ww			FBC			FC	AgI	
LC	Little Mormon Lake	34°17'00"/109°58'06"	Igneous		A&Ww			FBC			FC	AgI	AgL
LC	Little Ortega Lake	34°22'47"/109°40'06"	Igneous	A&Wc				FBC			FC		

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
LC	Long Lake, Lower	34°47'16"/111°12'40"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Long Lake, Upper	35°00'08"/111°21'23"	Igneous	A&Wc				FBC			FC		AgL
LC	Long Tom Tank	34°20'35"/110°49'22"		A&Wc				FBC			FC		AgL
LC	Lower Walnut Canyon Lake (EDW)	35°12'04"/111°34'07"	EDW				A&Wedww		PBC				
LC	Lyman Reservoir	34°21'21"/109°21'35"	Deep	A&Wc				FBC			FC	AgI	AgL
LC	Mamie Creek	Headwaters to confluence with Coyote Creek		A&Wc				FBC			FC		AgL
LC	Marshall Lake	35°07'18"/111°32'07"	Igneous	A&Wc				FBC			FC		AgL
LC	McKay Reservoir	34°01'27"/109°13'48"		A&Wc				FBC			FC	AgI	AgL
LC	Merritt Draw Creek	Headwaters to confluence with Barbershop Canyon Creek		A&Wc				FBC			FC		AgL
LC	Mexican Hay Lake	34°01'58"/109°21'25"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Milk Creek	Headwaters to confluence with Hulsey Creek		A&Wc				FBC			FC		AgL
LC	Miller Canyon Creek	Headwaters to confluence with East Clear Creek		A&Wc				FBC			FC		AgL
LC	Miller Canyon Creek, East Fork	Headwaters to confluence with Miller Canyon Creek		A&Wc				FBC			FC		AgL
LC	Mineral Creek	Headwaters to Little Ortega Lake		A&Wc				FBC			FC	AgI	AgL
LC	Mormon Lake	34°56'38"/111°27'25"	Shallow	A&Wc				FBC		DWS	FC	AgI	AgL
LC	Morton Lake	34°53'37"/111°17'41"	Igneous	A&Wc				FBC			FC		AgL
LC	Mud Lake	34°55'19"/111°21'29"	Shallow		A&Ww			FBC			FC		AgL
LC	Ned Lake (EDW)	34°17'17"/110°03'22"	EDW				A&Wedww		PBC				

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
LC	Nelson Reservoir	34°02'52"/109°11'19"	Sedimentary	A&Wc				FBC			FC	AgI	AgL
LC	Norton Reservoir	34°03'57"/109°31'27"	Igneous		A&Ww			FBC			FC		AgL
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
LC	Nutrioso Creek	Headwaters to confluence with the Little Colorado River		A&Wc				FBC			FC	AgI	AgL
LC	Paddy Creek	Headwaters to confluence with Nutrioso Creek		A&Wc				FBC			FC		AgL
LC	Phoenix Park Wash	Headwaters to Dry Lake				A&We			PBC				
LC	Pierce Seep	34°23'39"/110°31'17"		A&Wc					PBC				
LC	Pine Tank	34°46'49"/111°17'21"	Igneous		A&Ww			FBC			FC		AgL
LC	Pintail Lake (EDW)	34°18'05"/110°01'21"	EDW				A&Wedw		PBC				
LC	Porter Creek	Headwaters to confluence with Show Low Creek		A&Wc				FBC			FC		AgL
LC	Potato Lake	35°03'15"/111°24'13"	Igneous	A&Wc				FBC			FC		AgL
LC	Pratt Lake	34°01'32"/109°04'18"	Sedimentary	A&Wc				FBC			FC		
LC	Puerco River	Headwaters to confluence with the Little Colorado River						A&Ww					
LC	Puerco River (EDW)	Sanders Unified School District WWTP outfall at 35°12'52"/109°19'40" to 0.5 km downstream					A&Wedw		PBC				
LC	Rainbow Lake	34°09'00"/109°59'09"	Shallow Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Reagan Reservoir	34°02'09"/109°08'41"	Igneous		A&Ww			FBC			FC		AgL
LC	Rio de Flag	Headwaters to City of Flagstaff WWTP outfall at 35°12'21"/111°39'17"				A&We			PBC				

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
LC	Rio de Flag (EDW)	From City of Flagstaff WWTP outfall to the confluence with San Francisco Wash					A&Wedw		PBC				
LC	River Reservoir	34°02'01"/109°26'07"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Rogers Reservoir	33°56'30"/109°16'20"	Igneous		A&Ww			FBC			FC		AgL
LC	Rudd Creek	Headwaters to confluence with Nutrioso Creek		A&Wc				FBC			FC		AgL
LC	Russel Reservoir	33°59'29"/109°20'01"	Igneous		A&Ww			FBC			FC	AgI	AgL
LC	San Salvador Reservoir	33°58'51"/109°19'55"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Scott Reservoir	34°10'31"/109°57'31"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Show Low Creek	Headwaters to confluence with Silver Creek		A&Wc				FBC			FC	AgI	AgL
LC	Show Low Lake	34°11'36"/110°00'12"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Silver Creek	Headwaters to confluence with the Little Colorado River		A&Wc				FBC			FC	AgI	AgL
LC	Slade Reservoir	33°59'41"/109°20'26"	Igneous		A&Ww			FBC			FC	AgI	AgL
LC	Soldiers Annex Lake	34°47'15"/111°13'51"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Soldiers Lake	34°47'47"/111°14'04"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Spaulding Tank	34°30'17"/111°02'06"			A&Ww			FBC			FC		AgL
LC	Sponseller Lake	34°14'09"/109°50'45"	Igneous	A&Wc				FBC			FC		AgL
LC	St Johns Reservoir (Little Reservoir)	34°29'10"/109°22'06"	Igneous		A&Ww			FBC			FC	AgI	AgL
LC	Telephone Lake (EDW)	34°17'35"/110°02'42"	EDW				A&Wedw		PBC				
LC	Tremaine Lake	34°46'02"/111°13'51"	Igneous	A&Wc				FBC			FC		AgL
LC	Tunnel Reservoir	34°01'53"/109°26'34"	Igneous	A&Wc				FBC			FC	AgI	AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
LC	Turkey Draw (EDW)	High Country Pines II WWTP outfall at 33°25'35"/ 110°38'13" to confluence with Black Canyon Creek					A&Wedw		PBC				
LC	Unnamed Wash (EDW)	Bison Ranch WWTP outfall at 34°23'31"/110°31'29" to Pierce Seep					A&Wedw		PBC				
LC	Unnamed Wash (EDW)	Black Mesa Ranger Station WWTP outfall at 34°23'35"/110°33'36" to confluence of Oklahoma Flat Draw					A&Wedw		PBC				
LC	Vail Lake	35°05'23"/111°30'46"	Igneous	A&Wc				FBC			FC		AgL
LC	Walnut Creek	Headwaters to confluence with Billy Creek		A&Wc				FBC			FC		AgL
LC	Water Canyon Creek	Headwaters to confluence with the Little Colorado River		A&Wc				FBC			FC		AgL
LC	Water Canyon Reservoir	34°00'16"/109°20'05"	Igneous		A&Ww			FBC			FC	AgI	AgL
LC	Whale Lake (EDW)	35°11'13"/111°35'21"	EDW				A&Wedw		PBC				
LC	Whipple Lake	'34°16'49"/109°58'29"	Igneous		A&Ww			FBC			FC		AgL
LC	White Mountain Lake	34°21'57"/109°59'21"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	White Mountain Reservoir	34°00'12"/109°30'39"	Igneous	A&Wc				FBC			FC	AgI	AgL
LC	Willow Creek	Headwaters to confluence with Clear Creek		A&Wc				FBC			FC		AgL
LC	Willow Springs Canyon Creek	Headwaters to confluence with Chevelon Creek		A&Wc				FBC			FC		AgL
LC	Willow Springs Lake	34°18'13"/110°52'16"	Sedimentary	A&Wc				FBC			FC	AgI	AgL
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
LC	Woodland Reservoir	34°07'35"/109°57'01"	Igneous	A&Wc				FBC			FC	AgI	AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
LC	Woods Canyon Creek	Headwaters to confluence with Chevelon Creek		A&Wc				FBC			FC		AgL
LC	Woods Canyon Lake	34°20'09"/110°56'45"	Sedimentary	A&Wc				FBC			FC	AgI	AgL
LC	Zuni River	Headwaters to confluence with the Little Colorado River		A&Wc				FBC			FC	AgI	AgL
MG	Agua Fria River	Headwaters to confluence with unnamed tributary at 34°35'14"/112°16'18"				A&We			PBC				AgL
MG	Agua Fria River (EDW)	Below confluence with unnamed tributary to State Route 169					A&Wedw		PBC				AgL
MG	Agua Fria River	From State Route 169 to Lake Pleasant			A&Ww			FBC		DWS	FC	AgI	AgL
MG	Agua Fria River	Below Lake Pleasant to the City of El Mirage WWTP at ' 33°34'20"/112°18'32"				A&We			PBC				AgL
MG	Agua Fria River (EDW)	From City of El Mirage WWTP outfall to 2 km downstream					A&Wedw		PBC				
MG	Agua Fria River	Below 2 km downstream of the City of El Mirage WWTP to City of Avondale WWTP outfall at 33°23'55"/112°21'16"				A&We			PBC				
MG	Agua Fria River	From City of Avondale WWTP outfall to confluence with Gila River					A&Wedw		PBC				
MG	Alvord Park Lake	35th Avenue & Baseline Road, Phoenix at 33°22'23"/ 112°08'20"	Urban		A&Ww				PBC		FC		
MG	Andorra Wash	Headwaters to confluence with Cave Creek Wash				A&We			PBC				
MG	Antelope Creek	Headwaters to confluence with Martinez Creek			A&Ww			FBC			FC		AgL
MG	Arlington Canal	From Gila River at 33°20'54"/112°35'39" to Gila River at 33°13'44"/112°46'15"											

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Eedww	FBC	PBC	DWS	FC	AgI	AgL
MG	Ash Creek	Headwaters to confluence with Tex Canyon		A&Wc				FBC			FC	AgI	AgL
MG	Ash Creek	Below confluence with Tex Canyon to confluence with Agua Fria River			A&Ww			FBC			FC	AgI	AgL
MG	Beehive Tank	32°52'37"/111°02'20"			A&Ww			FBC			FC		AgL
MG	Big Bug Creek	Headwaters to confluence with Eugene Gulch		A&Wc				FBC			FC	AgI	AgL
MG	Big Bug Creek	Below confluence with Eugene Gulch to confluence with Agua Fria River			A&Ww			FBC			FC	AgI	AgL
MG	Black Canyon Creek	Headwaters to confluence with the Agua Fria River			A&Ww			FBC			FC		AgL
MG	Blind Indian Creek	Headwaters to confluence with the Hassayampa River			A&Ww			FBC			FC		AgL
MG	Bonsall Park Lake	59th Avenue & Bethany Home Road, Phoenix at 33°31'24"/112°11'08"	Urban		A&Ww				PBC		FC		
MG	Canal Park Lake	College Avenue & Curry Road, Tempe at 33°26'54"/ 111°56'19"	Urban		A&Ww				PBC		FC		
MG	Cave Creek	Headwaters to the Cave Creek Dam			A&Ww			FBC			FC		AgL
MG	Cave Creek	Cave Creek Dam to the Arizona Canal				A&We			PBC				
MG	Centennial Wash	Headwaters to confluence with the Gila River at 33°16'32"/112°48'08"				A&We			PBC				AgL
MG	Centennial Wash Ponds	33°54'52"/113°23'47"			A&Ww			FBC			FC		AgL
MG	Chaparral Park Lake	Hayden Road & Chaparral Road, Scottsdale at 33°30'40"/111°54'27"	Urban		A&Ww				PBC		FC	AgI	
MG	Cortez Park Lake	35th Avenue & Dunlap, Glendale at 33°34'13"/ 112°07'52"	Urban		A&Ww				PBC		FC	AgI	
MG	Desert Breeze Lake	Galaxy Drive, West Chandler at 33°18'47"/ 111°55'10"	Urban		A&Ww				PBC		FC		
MG	Devils Canyon	Headwaters to confluence with Mineral Creek			A&Ww				FBC		FC		AgL
MG	Dobson Lake	Dobson Road & Los Lagos Vista Avenue, Mesa at 33°22'48"/111°52'35"	Urban		A&Ww				PBC		FC		

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
MG	East Maricopa Floodway	From Brown and Greenfield Rds to the Gila River Indian Reservation Boundary			A&We				PBS				AgL
MG	Eldorado Park Lake	Miller Road & Oak Street, Tempe at 33°28'25"/ 111°54'53"	Urban		A&Ww				PBC		FC		
MG	Encanto Park Lake	15th Avenue & Encanto Blvd., Phoenix at 33°28'28"/ 112°05'18"	Urban		A&Ww				PBC		FC	AgI	
MG	Fain Lake	Town of Prescott Valley Park Lake 34°34'29"/ 112°21'06"	Urban		A&Ww				PBC		FC		
MG	French Gulch	Headwaters to confluence with Hassayampa River			A&Ww				PBC				AgL
MG	Galena Gulch	Headwaters to confluence with the Agua Fria River				A&We			PBC				AgL
MG	Galloway Wash (EDW)	Town of Cave Creek WWTP outfall at 33°50'15"/ 111°57'35" to confluence with Cave Creek					A&Wedw		PBC				
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
MG	Gila River	San Carlos Indian Reservation boundary to the Ashurst-Hayden Dam			A&Ww			FBC			FC	AgI	AgL
MG	Gila River	Ashurst-Hayden Dam to the Town of Florence WWTP outfall at 33°02'20"/111°24'19"				A&We			PBC				AgL
MG	Gila River (EDW)	Town of Florence WWTP outfall to Felix Road					A&Wedw		PBC				
MG	Gila River	Felix Road to the Gila River Indian Reservation boundary				A&We			PBC				AgL
MG	Gila River (EDW)	From the confluence with the Salt River to Gillespie Dam					A&Wedw		PBC		FC	AgI	AgL
MG	Gila River	Gillespie Dam to confluence with Painted Rock Dam			A&Ww			FBC			FC	AgI	AgL
MG	Granada Park Lake	6505 North 20th Street, Phoenix at 33°31'56"/ 112°02'16"	Urban		A&Ww				PBC		FC		

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
MG	Groom Creek	Headwaters to confluence with the Hassayampa River		A&Wc				FBC		DWS	FC		AgL
~~MG~~	~~Lower Lake Pleasant~~	~~33°50'32"/112°16'03"~~			~~A&Ww~~			~~FBC~~			~~FC~~	~~AgI~~	~~AgL~~
MG	Hassayampa Lake	34°25'45"/112°25'33"	Igneous	A&Wc				FBC		DWS	FC		
MG	Hassayampa River	Headwaters to confluence with ~~unnamed tributary at 34°26'09"/112°30'32"~~ Copper Creek		A&Wc				FBC			FC	AgI	AgL
MG	Hassayampa River	Below confluence with ~~unnamed tributary to confluence with unnamed tributary at 33°51'52"/ 112°39'56"~~ Copper Creek to the confluence with Blind Indian Creek.			A&Ww			FBC			FC	AgI	AgL
MG	Hassayampa River	Below confluence with Blind Indian Creek ~~unnamed tributary~~ to the Buckeye Irrigation Company Canal				A&We			PBC				AgL
MG	Hassayampa River	Below Buckeye Irrigation Company canal to the Gila River			A&Ww			FBC			FC		AgL
MG	Horsethief Lake	34°09'42"/112°17'57"	Igneous	A&Wc				FBC		DWS	FC		AgL
MG	Indian Bend Wash	Headwaters to confluence with the Salt River				A&We			PBC				
MG	Indian Bend Wash Lakes	Scottsdale at 33°30'32"/111°54'24"	Urban					A&Ww					
MG	Indian School Park Lake	Indian School Road & Hayden Road, Scottsdale at 33°29'39"/111°54'37"	Urban		A&Ww				PBC		FC		
MG	Kiwanis Park Lake	6000 South Mill Avenue, Tempe at 33°22'27"/ 111°56'22"	Urban		A&Ww				PBC		FC	AgI	
MG	Lake Pleasant	33°53'46"/112°16'29"	Deep		A&Ww			FBC		DWS	FC	AgI	AgL
MG	Lake Pleasant, Lower	33°50'32"/112°16'03"			A&Ww			FBC			FC	AgI	AgL
~~MG~~	~~The Lake Tank~~	~~32°54'14"/111°04'15"~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
MG	Lion Canyon	Headwaters to confluence with Weaver Creek			A&Ww			FBC			FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
MG	Little Ash Creek	Headwaters to confluence with Ash Creek at			A&Ww			FBC			FC		AgL
MG	Lynx Creek	Headwaters to confluence with unnamed tributary at 34°34'29"/112°21'07"		A&Wc				FBC			FC		AgL
MG	Lynx Creek	Below confluence with unnamed tributary at 34°34'29"/112°21'07" to confluence with Agua Fria River			A&Ww			FBC			FC		AgL
MG	Lynx Lake	34°31'07"/112°23'07"	Deep	A&Wc				FBC		DWS	FC	AgI	AgL
MG	Maricopa Park Lake	33°35'28"/112°18'15"	Urban		A&Ww				PBC		FC		
MG	Martinez Canyon	Headwaters to confluence with Box Canyon			A&Ww			FBC			FC		AgL
MG	Martinez Creek	Headwaters to confluence with the Hassayampa River			A&Ww			FBC			FC	AgI	AgL
MG	McKellips Park Lake	Miller Road & McKellips Road, Scottsdale at 33°27'14"/111°54'49"	Urban		A&Ww				PBC		FC	AgI	
MG	McMicken Wash (EDW)	City of Peoria Jomax WWTP outfall at 33°43'31"/ 112°20'15" to confluence with Agua Fria River					A&Wedw		PBC				
MG	Mineral Creek	Headwaters to 33°12'34"/110°59'58"			A&Ww			FBC			FC		AgL
MG	Mineral Creek (diversion tunnel and lined channel)	33°12'24"/110°59'58" to 33°07'56"/110°58'34"						PBC					
MG	Mineral Creek	End of diversion channel to confluence with Gila River			A&Ww			FBC			FC		AgL
MG	Minnehaha Creek	Headwaters to confluence with the Hassayampa River			A&Ww			FBC			FC		AgL
MG	Mountain Valley Park Ponds (EDW)	Town of Prescott Valley WWTP outfall 002 at 34°36'07"/112°18'48" to Navajo Wash	EDW				A&Wedw		PBC				
MG	New River	Headwaters to Interstate 17 at 33°54'19.5"/112°08'46"			A&Ww			FBC			FC	AgI	AgL
MG	New River	Below Interstate 17 to confluence with Agua Fria River				A&We			PBC				AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
MG	Painted Rock Reservoir	33°04'23"/113°00'38"	Sedimentary		A&Ww			FBC			FC	AgI	AgL
MG	Papago Park Ponds	Galvin Parkway, Phoenix at 33°27'15"/111°56'45"	Urban		A&Ww				PBC		FC		
MG	Papago Park South Pond	Curry Road, Tempe 33°26'22"/111°55'55"	Urban		A&Ww				PBC		FC		
MG	Perry Mesa Tank	34°11'03"/112°02'01"			A&Ww			FBC			FC		AgL
MG	Phoenix Area Canals	Granite Reef Dam to all municipal WTP intakes								DWS		AgI	AgL
MG	Phoenix Area Canals	Below municipal WTP intakes and all other locations										AgI	AgL
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
MG	Picacho Reservoir	32°51'10"/111°28'25"	Shallow		A&Ww			FBC			FC	AgI	AgL
MG	Poland Creek	Headwaters to confluence with Lorena Gulch		A&Wc				FBC			FC		AgL
MG	Poland Creek	Below confluence with Lorena Gulch to confluence with Black Canyon Creek			A&Ww			FBC			FC		AgL
MG	Queen Creek	Headwaters to the Town of Superior WWTP outfall at 33°16'33"/111°07'44"			A&Ww				PBC		FC		AgL
MG	Queen Creek (EDW)	Below Town of Superior WWTP outfall to confluence with Potts Canyon					A&Wedw		PBC				
MG	Queen Creek	Below Potts Canyon to ' Whitlow Dam			A&Ww			FBC			FC		AgL
MG	Queen Creek	Below Whitlow Dam to confluence with Gila River				A&We			PBC				
MG	Riverview Park Lake	Dobson Road & 8th Street, Mesa at 33°25'50"/ 111°52'29"	Urban		A&Ww				PBC		FC		
MG	Roadrunner Park Lake	36th Street & Cactus, Phoenix at 33°35'56"/ 112°00'21"	Urban		A&Ww				PBC		FC		

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
MG	Salt River	Verde River to 2 km below Granite Reef Dam			A&Ww			FBC		DWS	FC	AgI	AgL
MG	Salt River	2 km below Granite Reef Dam to City of Mesa NW WRF outfall at 33°26'22"/111°53'14"				A&We			PBC				
MG	Salt River (EDW)	City of Mesa NW WRF outfall to Tempe Town Lake					A&Wedw		PBC				
MG	Salt River	Below Tempe Town Lake to Interstate 10 bridge				A&We			PBC				
MG	Salt River	Below Interstate 10 bridge to the City of Phoenix 23rd Avenue WWTP outfall at . 33°24'44"/ 112°07'59"			A&Ww				PBC		FC		
MG	Salt River (EDW)	From City of Phoenix 23rd Avenue WWTP outfall to confluence with Gila River					A&Wedw		PBC		FC	AgI	AgL
MG	Siphon Draw (EDW)	Superstition Mountains CFD WWTP outfall at 33°21'40"/111°33'30" to 6 km downstream					A&Wedw		PBC				
MG	Sycamore Creek	Headwaters to confluence with Tank Canyon		A&Wc				FBC			FC		AgL
MG	Sycamore Creek	Below confluence with Tank Canyon to confluence with Agua Fria River						A&Ww					
MG	Tempe Town Lake	At Mill Avenue Bridge at 33°26'00"/111°56'26"	Urban		A&Ww			FBC			FC		
MG	The Lake Tank	32°54'14"/111°04'15"			A&Ww			FBC			FC		AgL
MG	Tule Creek	Headwaters to confluence with the Agua Fria River			A&Ww			FBC			FC		AgL
MG	Turkey Creek	Headwaters to confluence with unnamed tributary at 34°19'28"/112°21'33"		A&Wc				FBC			FC	AgI	AgL
MG	Turkey Creek	Below confluence with unnamed tributary to confluence with Poland Creek			A&Ww			FBC			FC	AgI	AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
MG	Unnamed Wash (EDW)	Gila Bend WWTP outfall to confluence with the Gila River					A&Wedw		PBC				
MG	Unnamed Wash (EDW)	Luke Air Force Base WWTP outfall at ~~33°32'00"/ 112°19'03"~~ 33°32'21"/112°19'15" to confluence with the Agua Fria River					A&Wedw		PBC				
MG	Unnamed Wash (EDW)	North Florence WWTP outfall at 33°03'50"/ 111°23'13" to confluence with Gila River					A&Wedw		PBC				
MG	Unnamed Wash (EDW)	Town of Prescott Valley WWTP outfall at34°35'16"/ 112°16'18" to confluence with the Agua Fria River					A&Wedw		PBC				
MG	Unnamed Wash (EDW)	Town of Cave Creek WRF outfall at 33°48'02"/ 111°59'22" to confluence with Cave Creek					A&Wedw		PBC				
MG	Wagner Wash (EDW)	City of Buckeye Festival Ranch WRF outfall at 33°39'14"/112°40'18" to 2 km downstream					A&Wedw		PBC				
MG	Walnut Canyon Creek	Headwaters to confluence with the Gila River			A&Ww			FBC			FC		AgL
MG	Weaver Creek	Headwaters to confluence with Antelope Creek, tributary to Martinez Creek			A&Ww			FBC			FC		AgL
MG	White Canyon Creek	Headwaters to confluence with Walnut Canyon Creek			A&Ww			FBC			FC		AgL
SC	Agua Caliente Lake	12325 East Roger Road, Tucson 32°16'51"/ 110°43'52"	Urban		A&Ww				PBC		FC		
SC	Agua Caliente Wash	Headwaters to confluence with Soldier Trail			A&Ww			FBC			FC		AgL
SC	Agua Caliente Wash	Below Soldier Trail to confluence with Tanque Verde Creek				A&We			PBC				AgL
SC	Aguirre Wash	From the Tohono O'odham Indian Reservation boundary to 32°28'38"/111°46'51"				A&We			PBC				
SC	Alambre Wash	Headwaters to confluence with Brawley Wash				A&We			PBC				
SC	Alamo Wash	Headwaters to confluence with Rillito Creek				A&We			PBC				

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
SC	Altar Wash	Headwaters to confluence with Brawley Wash				A&We			PBC				
SC	Alum Gulch	Headwaters to 31°28'20"/110°43'51"				A&We			PBC				AgL
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
SC	Alum Gulch	From 31°28'20"/110°43'51" to 31°29'17"/110°44'25"			A&Ww			FBC			FC		AgL
SC	Alum Gulch	Below 31°29'17"/110°44'25" to confluence with Sonoita Creek				A&We			PBC				AgL
SC	Arivaca Creek	Headwaters to confluence with Altar Wash			A&Ww			FBC			FC		AgL
SC	Arivaca Lake	31°31'52"/111°15'06"	Igneous		A&Ww			FBC			FC	AgI	AgL
SC	Atterbury Wash	Headwaters to confluence with Pantano Wash				A&We			PBC				AgL
SC	Bear Grass Tank	31°33'01"/111°11'03"			A&Ww			FBC			FC		AgL
SC	Big Wash	Headwaters to confluence with Cañada del Oro				A&We			PBC				
SC	Black Wash (EDW)	Pima County WWMD Avra Valley WWTP outfall at 32°09'58"/111°11'17" to confluence with Brawley Wash					A&Wedww		PBC				
SC	Bog Hole Tank	31°28'36"/110°37'09"			A&Ww			FBC			FC		AgL
SC	Brawley Wash	Headwaters to confluence with Los Robles Wash				A&We			PBC				
SC	California Gulch	Headwaters To U.S./Mexico border			A&Ww			FBC			FC		AgL
SC	Cañada del Oro	Headwaters to State Route 77			A&Ww			FBC			FC	AgI	AgL
SC	Cañada del Oro	Below State Route 77 to confluence with the Santa Cruz River				A&We			PBC				AgL
SC	Cienega Creek	Headwaters to confluence with Gardner Canyon			A&Ww			FBC			FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SC	Cienega Creek (OAW)	From confluence with Gardner Canyon to USGS gaging station (#09484600)			A&Ww			FBC			FC		AgL
SC	Davidson Canyon	Headwaters to unnamed spring at 31°59'00"/ 110°38'49"				A&We			PBC				AgL
SC	Davidson Canyon (OAW)	From unnamed Spring to confluence with unnamed tributary at 31°59'09"/110°38'44"			A&Ww			FBC			FC		AgL
SC	Davidson Canyon (OAW)	Below confluence with unnamed tributary to unnamed spring at 32°00'40"/110°38'36"				A&We			PBC				AgL
SC	Davidson Canyon (OAW)	From unnamed spring to confluence with Cienega Creek			A&Ww			FBC			FC		AgL
SC	Empire Gulch	Headwaters to unnamed spring at 31°47'18"/ 110°38'17"				A&We			PBC				
SC	Empire Gulch	From 31°47'18"/110°38'17" to 31°47'03"/110°37'35"			A&Ww			FBC			FC		
SC	Empire Gulch	From 31°47'03"/110°37'35" to 31°47'05"/ 110°36'58"				A&We			PBC				AgL
SC	Empire Gulch	From 31°47'05"/110°36'58" to confluence with Cienega Creek			A&Ww			FBC			FC		
SC	Flux Canyon	Headwaters to confluence with Alum ~~Canyon~~ Gulch				A&We			PBC				AgL
SC	Gardner Canyon Creek	Headwaters to confluence with Sawmill Canyon		A&Wc				FBC			FC		
SC	Gardner Canyon Creek	Below Sawmill Canyon to confluence with Cienega Creek			A&Ww			FBC			FC		
SC	Greene Wash	~~Greene Reservoir at 32°37'09"/111°41'12" to the Tohono O'odham Indian Reservation boundary~~ Santa Cruz River to the Tohono O'odham Indian Reservation boundary				A&We			PBC				
SC	Greene Wash	Tohono O'odham Indian Reservation boundary to confluence with Santa Rosa Wash at 32°53'52"/ 111°56'48"				A&We			PBC				

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
SC	Harshaw Creek	Headwaters to confluence with Sonoita Creek at				A&We			PBC				AgL
SC	Hit Tank	32°43'57"/111°03'18"						A&Ww					
SC	Holden Canyon Creek	Headwaters to U.S./Mexico border			A&Ww			FBC			FC		
SC	Huachuca Tank	31°21'11"/110°30'18"			A&Ww			FBC			FC		AgL
SC	Julian Wash	Headwaters to confluence with the Santa Cruz River				A&We			PBC				
SC	Kennedy Lake	Mission Road & Ajo Road, Tucson at 32°10'49"/ 111°00'27"	Urban		A&Ww				PBC		FC		
SC	Lakeside Lake	8300 East Stella Road, Tucson at 32°11'11"/ 110°49'00"	Urban		A&Ww				PBC		FC		
SC	Lemmon Canyon Creek	Headwaters to confluence with unnamed tributary at 32°23'48"/110°47'49"		A&Wc				FBC			FC		
SC	Lemmon Canyon Creek	Below unnamed tributary at 32°23'48"/110°47'49" to confluence with Sabino Canyon Creek			A&Ww			FBC			FC		
SC	Los Robles Wash	Headwaters to confluence with the Santa Cruz River				A&We			PBC				
SC	Madera Canyon Creek	Headwaters to confluence with unnamed tributary at 31°43'42"/110°52'51"		A&Wc				FBC			FC		AgL
SC	Madera Canyon Creek	Below unnamed tributary at 31°43'42"/110°52'51 to confluence with the Santa Cruz River			A&Ww			FBC			FC		AgL
SC	Mattie Canyon	Headwaters to confluence with Cienega Creek "			A&Ww			FBC			FC		AgL
SC	Nogales Wash	Headwaters to confluence with Potrero Creek			A&Ww				PBC		FC		
SC	Oak Tree Canyon	Headwaters to confluence with Cienega Creek				A&We			PBC				
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
SC	Palisade Canyon ~~Creek~~	Headwaters ~~to confluence with unnamed tributary at 32°21'59"/110°46'16"~~ at 32°22'33"/110°45'31"		A&Wc				FBC			FC		
SC	Palisade Canyon ~~Creek~~	Below ~~unnamed tributary 32°22'33"/110°45'31"~~ to unnamed tributary of ~~confluence with~~ Sabino Canyon ~~Creek~~			A&Ww			FBC			FC		
SC	Pantano Wash	Headwaters to confluence with Tanque Verde Creek				A&We			PBC				
SC	Parker Canyon Creek	Headwaters to confluence with unnamed tributary at 31°24'17"/110°28'47"	A&Wc					FBC			FC		
SC	Parker Canyon Creek	Below unnamed tributary to U.S./Mexico border			A&Ww			FBC			FC		
SC	Parker Canyon Lake	31°25'35"/110°27'15"	Deep	A&Wc				FBC			FC	AgI	AgL
SC	Patagonia Lake	31°29'56"/110°50'49"	Deep		A&Ww			FBC			FC	AgI	AgL
SC	Peña Blanca Lake	31°24'15"/111°05'12"	Igneous		A&Ww			FBC			FC	AgI	AgL
SC	Potrero Creek	Headwaters to Interstate 19				A&We			PBC				AgL
SC	Potrero Creek	Below Interstate 19 to confluence with Santa Cruz River			A&Ww			FBC			FC		AgL
SC	Puertocito Wash	Headwaters to confluence with Altar Wash				A&We			PBC				
SC	Quitobaquito Spring	(Pond and Springs) 31°56'39"/113°01'06"			A&Ww			FBC			FC		AgL
SC	Redrock Canyon Creek	Headwaters to confluence with Harshaw Creek			A&Ww			FBC			FC		
SC	Rillito Creek	Headwaters to confluence with the Santa Cruz River				A&We			PBC				AgL
SC	Romero Canyon Creek	Headwaters to confluence with unnamed tributary at 32°24'29"/110°50'39"		A&Wc				FBC			FC		
SC	Romero Canyon Creek	Below unnamed tributary to confluence with Sutherland Wash			A&Ww			FBC			FC		

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SC	Rose Canyon Creek	Headwaters to ~~Rose Canyon Lake~~ confluence with Sycamore Canyon		A&Wc				FBC			FC		
SC	Rose Canyon Lake	32°23'13"/110°42'38"	Igneous	A&Wc				FBC			FC		AgL
SC	Ruby Lakes	31°26'29"/111°14'22"	Igneous		A&Ww			FBC			FC		AgL
SC	Sabino Canyon ~~Creek~~	Headwaters to ~~confluence with unnamed tributary at 32°23'28"/110°47'03"~~ 32°23'20"/110°47'06"		A&Wc				FBC		DWS	FC	AgI	
SC	Sabino Canyon ~~Creek~~	Below ~~unnamed tributary~~ 32°23'20"/110°47'06" to confluence with Tanque Verde River			A&Ww			FBC		DWS	FC	AgI	
SC	Salero Ranch Tank	31°35'43"/110°53'25"			A&Ww			FBC			FC		AgL
SC	Santa Cruz River	Headwaters to the at U.S./Mexico border			A&Ww			FBC			FC	AgI	AgL
SC	Santa Cruz River	U.S./Mexico border to the Nogales International WWTP outfall at 31°27'25"/110°58'04"			A&Ww			FBC		DWS	FC	AgI	AgL
SC	Santa Cruz River (EDW)	Nogales International WWTP outfall to the ~~Tubac Bridge~~ Josephine Canyon					A&Wedw		PBC				AgL
SC	Santa Cruz River	~~Tubac Bridge~~ Josephine Canyon to Agua Nueva WRF outfall at 32°17'04"/111°01'45"				A&We			PBC				AgL
SC	Santa Cruz River (EDW)	Agua Nueva WRF outfall to Baumgartner Road					A&Wedw		PBC				
SC	Santa Cruz River, West Branch	Headwaters to the confluence with Santa Cruz River				A&We			PBC				AgL
SC	Santa Cruz ~~Wash~~ River	Baumgartner Road to the Ak Chin Indian Reservation boundary				A&We			PBC				AgL
SC	Santa Cruz Wash, North Branch	Headwaters to City of Casa Grande WRF outfall at 32°54'57"/111°47'13"										A&We	

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
SC	Santa Cruz Wash, North Branch (EDW)	City of Casa Grande WRF outfall to 1 km downstream					A&Wedw		PBC				
SC	Santa Rosa Wash	Below Tohono O'odham Indian Reservation to the Ak Chin Indian Reservation				A&We			PBC				
SC	Santa Rosa Wash (EDW)	Palo Verde Utilities ~~WWTP~~ CO-WRF outfall at 33°04'20"/ 112°01'47" to the ~~Gila River~~ Chin Indian Reservation					A&Wedw		PBC				
SC	Soldier ~~Lake~~ Tank	32°25'34"/110°44'43"		A&Wc				FBC			FC		AgL
SC	Sonoita Creek	Headwaters to the Town of Patagonia WWTP outfall at 31°32'25"/110°45'31"				A&We			PBC				AgL
SC	Sonoita Creek (EDW)	Town of Patagonia WWTP outfall to permanent groundwater upwelling point approximately 1600 feet downstream of outfall					A&Wedw		PBC				AgL
SC	Sonoita Creek	Below 1600 feet downstream of Town of Patagonia WWTP outfall groundwater upwelling point to confluence with the Santa Cruz River			A&Www			FBC			FC	AgI	AgL
SC	Split Tank	31°28'11"/111°05'12"			A&Www			FBC			FC		AgL
SC	Sutherland Wash	Headwaters to confluence with Cañada del Oro			A&Ww			FBC			FC		
SC	Sycamore Canyon	Headwaters to 32°21'60" / 110°44'48"		A&Wc				FBC			FC		
SC	Sycamore Canyon	From 32°21'60" / 110°44'48" to Sycamore Reservoir			A&Ww			FBC			FC		
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
SC	Sycamore Canyon ~~Creek~~	Headwaters to the U.S./Mexico border			A&Www			FBC			FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SC	Sycamore Reservoir	32°20'57"/110°47'38"		A&Wc				FBC			FC		AgL
SC	Tanque Verde Creek	Headwaters to Houghton Road			A&Ww			FBC			FC		AgL
SC	Tanque Verde Creek	Below Houghton Road to confluence with Rillito Creek				A&We			PBC				AgL
SC	Three R Canyon	Headwaters to Unnamed Trib to Three R Canyon at 31°28'26"/110°46'04"				A&We			PBC				AgL
SC	Three R Canyon	From 31°28'26"/110°46'04" to 31°28'28"/110°47'15" (Cox Gulch)			A&Ww			FBC			FC		AgL
SC	Three R Canyon	From (Cox Gulch) 31°28'28"/110°47'15" to confluence with Sonoita Creek				A&We			PBC				AgL
SC	Tinaja Wash	Headwaters to confluence with the Santa Cruz River				A&We			PBC				AgL
SC	Unnamed Wash (EDW)	Oracle Sanitary District WWTP outfall at 32°36'54"/ 110°48'02" to 5 km downstream					A&Wedw		PBC				
SC	Unnamed Wash (EDW)	Arizona City Sanitary District WWTP outfall at 32°45'43"/111°44'24" to confluence with Santa Cruz Wash					A&Wedw		PBC				
SC	Unnamed Wash (EDW)	Saddlebrook WWTP outfall at 32°32'00"/110°53'01" to confluence with Cañada del Oro					A&Wedw		PBC				
SC	Vekol Wash	Headwater to Santa Cruz Wash: Those reaches not located on the Ak-Chin, Tohono O'odham and Gila River Indian Reservations				A&We			PBC				
SC	Wakefield Canyon	Headwaters to confluence with unnamed tributary at 31°52'48"/110°26'27"		A&Wc				FBC			FC		AgL
SC	Wakefield Canyon	Below confluence with unnamed tributary to confluence with Cienega Creek			A&Ww			FBC			FC		AgL
SC	Wild Burro Canyon	Headwaters to confluence with unnamed tributary at 32°27'43"/111°05'47"			A&Ww			FBC			FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SC	Wild Burro Canyon	Below confluence with unnamed tributary to confluence with Santa Cruz River				A&We			PBC				AgL
~~SC~~	~~Williams Ranch Tanks~~	~~31°55'14"/110°25'31"~~			~~A&Ww~~			~~FBC~~			~~FC~~		~~AgL~~
SP	Abbot Canyon	Headwaters to confluence with Whitewater Draw			A&Ww			FBC			FC		AgL
SP	Aravaipa Creek	Headwaters to confluence with Stowe Gulch			A&Ww			FBC			FC		AgL
SP	Aravaipa Creek (OAW)	Stowe Gulch to downstream boundary of Aravaipa Canyon Wilderness Area			A&Ww			FBC			FC		AgL
SP	Aravaipa Creek	Below downstream boundary of Aravaipa Canyon Wilderness Area to confluence with the San Pedro River			A&Ww			FBC			FC		AgL
SP	Ash Creek	Headwaters to 31°50'28"/109°40'04"			A&Ww			FBC			FC	AgI	AgL
SP	Babocomari River	Headwaters to confluence with the San Pedro River			A&Ww			FBC			FC		AgL
SP	Bass Canyon Creek	Headwaters to confluence with unnamed tributary at 32°26'06"/110°13'22"		A&Wc				FBC			FC		AgL
SP	Bass Canyon Creek	Below confluence with unnamed tributary to confluence with Hot Springs Canyon Creek			A&Ww			FBC			FC		AgL
SP	Bass Canyon Tank	32°24'00"/110°13'00"			A&Ww			FBC			FC		AgL
SP	Bear Creek	Headwaters to U.S./Mexico border			A&Ww			FBC			FC		AgL
SP	Big Creek	Headwaters to confluence with Pitchfork Canyon		A&Wc				FBC			FC		AgL
SP	Blacktail Pond	Fort Huachuca Military Reservation at ~~31°24'13"/ 110°17'23"~~ 31°31'04"/110°24'47", headwater lake in Blacktail Canyon			A&Ww			FBC			FC		
SP	Black~~water~~ Draw	Headwaters to the U.S./Mexico border						A&Ww					

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SP	Booger Canyon ~~Creek~~	Headwaters to confluence with Aravaipa Creek			A&Ww			FBC			FC		AgL
SP	Buck Canyon	Headwaters to confluence with Buck Creek Tank			A&Ww			FBC			FC		AgL
SP	Buck Canyon	Below Buck Creek Tank to confluence with Dry Creek				A&We			PBC				AgL
SP	Buehman Canyon ~~Creek~~ (OAW)	Headwaters to confluence with unnamed tributary at 32°24'54"/110°32'10"			A&Ww			FBC			FC		AgL
SP	Buehman Canyon ~~Creek~~	Below confluence with unnamed tributary to confluence with San Pedro River			A&Ww			FBC			FC		AgL
SP	Bull Tank	32°31'13"/110°12'52"			A&Ww			FBC			FC		AgL
SP	Bullock Canyon	Headwaters to confluence with Buehman Canyon			A&Ww			FBC			FC		AgL
SP	Carr Canyon Creek	Headwaters to confluence with unnamed tributary at 31°27'01"/110°15'48"		A&Wc				FBC			FC		AgL
SP	Carr Canyon Creek	Below confluence with unnamed tributary to confluence with the San Pedro River			A&Ww			FBC			FC		AgL
SP	Copper Creek	Headwaters to confluence with Prospect Canyon			A&Ww			FBC			FC		AgL
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
SP	Copper Creek	Below confluence with Prospect Canyon to confluence with the San Pedro River				A&We			PBC				AgL
SP	Deer Creek	Headwaters to confluence with unnamed tributary at 32°59'57"/110°20'11"		A&Wc				FBC			FC		AgL
SP	Deer Creek	Below confluence with unnamed tributary to confluence with Aravaipa Creek			A&Ww			FBC			FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
SP	Dixie Canyon	Headwaters to confluence with Mexican Canyon			A&Ww			FBC			FC		AgL
SP	Double R Canyon Creek	Headwaters to confluence with Bass Canyon			A&Ww			FBC			FC		
SP	Dry Canyon	Headwaters to confluence with ~~Abbot Canyon~~ Whitewater draw			A&Ww			FBC			FC		AgL
SP	East Gravel Pit Pond	Fort Huachuca Military Reservation at 31°30'54"/ 110°19'44"	Sedimentary		A&Ww			FBC			FC		
SP	Espiritu Canyon Creek	Headwaters to confluence with Soza Wash			A&Ww			FBC			FC		AgL
SP	Fly Pond	Fort Huachuca Military Reservation at 31°32'53"/ 110°21'16"			A&Ww			FBC			FC		
SP	Fourmile ~~Canyon~~ Creek	Headwaters to confluence with Aravaipa Creek			A&Ww			FBC			FC		AgL
SP	Fourmile Canyon, Left Prong	Headwaters to confluence with unnamed tributary at 32°43'15"/110°23'46"		A&Wc				FBC			FC		AgL
SP	Fourmile Canyon, Left Prong	Below confluence with unnamed tributary to confluence with Fourmile Canyon Creek			A&Ww			FBC			FC		AgL
SP	Fourmile Canyon, Right Prong	Headwaters to confluence with Fourmile Canyon			A&Ww			FBC			FC		AgL
SP	Gadwell Canyon	Headwaters to confluence with Whitewater Draw			A&Ww			FBC			FC		AgL
SP	Garden Canyon Creek	Headwaters to confluence with unnamed tributary at 31°29'01"/110°19'44"		A&Wc				FBC		DWS	FC	AgI	
SP	Garden Canyon Creek	Below confluence with unnamed tributary to confluence with the San Pedro River			A&Ww			FBC		DWS	FC	AgI	
SP	Glance Creek	Headwaters to confluence with Whitewater Draw			A&Ww			FBC			FC		AgL
SP	Gold Gulch	Headwaters to U.S./Mexico border			A&Ww			FBC			FC		AgL
~~SP~~	~~Golf Course Pond~~	~~Fort Huachuca Military Reservation at 31°32'14"/ 110°18'52"~~	~~Sedimentary~~		~~A&Www~~				~~PBC~~		~~FC~~		

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SP	Goudy Canyon ~~Creek~~ Wash	Headwaters to confluence with Grant Creek		A&Wc				FBC			FC		AgL
SP	Grant Creek	Headwaters to confluence with unnamed tributary at 32°38'10"/109°56'37"		A&Wc				FBC		DWS	FC		AgL
SP	Grant Creek	Below confluence with unnamed tributary to terminus near Willcox Playa			A&Ww			FBC			FC		AgL
SP	Gravel Pit Pond	Fort Huachuca Military Reservation at 31°30'52"/ 110°19'49"	Sedimentary		A&Ww			FBC			FC		
SP	~~Greenbrush~~ Greenbush Draw	From U.S./Mexico border to confluence with San Pedro River				A&We			PBC				
SP	Hidden Pond	Fort Huachuca Military Reservation at 32°30'30"/ 109°22'17"			A&Ww			FBC			FC		
SP	High Creek	Headwaters to confluence with unnamed tributary at 32°33'08"/110°14'42"		A&Wc				FBC			FC		AgL
SP	High Creek	Below confluence with unnamed tributary to terminus near Willcox Playa			A&Ww			FBC			FC		AgL
SP	Horse Camp Canyon ~~Creek~~	Headwaters to confluence with Aravaipa Creek			A&Ww			FBC			FC		AgL
SP	Hot Springs Canyon Creek	Headwaters to confluence with the San Pedro River			A&Ww			FBC			FC		AgL
SP	Johnson Canyon	Headwaters to Whitewater Draw at 31°32'46"/ 109°43'32"			A&Ww			FBC			FC		AgL
SP	Lake Cochise (EDW)	South of Twin Lakes Municipal Golf Course at 32°13'50"/109°49'27"	EDW										
SP	Leslie Canyon Creek	Headwaters to confluence with Whitewater Draw			A&Ww			FBC			FC		AgL
SP	Lower Garden Canyon Pond	Fort Huachuca Military Reservation at 31°29'39"/ 110°18'34"			A&Ww			FBC			FC		

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SP	Mexican Canyon	Headwaters to confluence with Dixie Canyon			A&Ww			FBC			FC		AgL
SP	Miller Canyon ~~Creek~~	Headwaters to Broken Arrow Ranch Road at 31°25'35"/110°15'04"		A&Wc				FBC		DWS	FC		AgL
SP	Miller Canyon ~~Creek~~	Below Broken Arrow Ranch Road to confluence with the San Pedro River			A&Ww			FBC		DWS	FC		AgL
SP	Moonshine Creek	Headwaters to confluence with Post Creek		A&Wc				FBC			FC		AgL
SP	Mountain View Golf Course Pond	Fort Huachuca Military Reservation at 31°32'14"/ 110°18'52"	Sedimentary		A&Ww				PBC		FC		
SP	Mule Gulch	Headwaters to the Lavender Pit at 31°26'11"/ 109°54'02"			A&Ww				PBC		FC		
SP	Mule Gulch	The Lavender Pit to the' Highway 80 bridge at 31°26'30"/109°49'28"				A&We			PBC				
SP	Mule Gulch	Below the Highway 80 bridge to confluence with Whitewater Draw				A&We			PBC				AgL
SP	Oak Grove Canyon	Headwaters to confluence with Turkey Creek			A&Ww			FBC			FC		AgL
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
SP	Officers Club Pond	Fort Huachuca Military Reservation at 31°32'51"/ 110°21'37"	Sedimentary		A&Ww				PBC		FC		
SP	Paige Canyon Creek	Headwaters to confluence with the San Pedro River			A&Ww			FBC			FC		AgL
SP	Parsons Canyon Creek	Headwaters to confluence with Aravaipa Creek			A&Ww			FBC			FC		AgL
SP	Pinery Creek	Headwaters to State Highway 181		A&Wc				FBC		DWS	FC		AgL
SP	Pinery Creek	Below State Highway 181 to terminus near Willcox Playa			A&Ww			FBC		DWS	FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
SP	Post Creek	Headwaters to confluence with Grant Creek		A&Wc				FBC			FC	AgI	AgL
SP	Ramsey Canyon Creek	Headwaters to Forest Service Road #110 at 31°27'44"/110°17'30"		A&Wc				FBC			FC	AgI	AgL
SP	Ramsey Canyon Creek	Below Forest Service Road #110 to confluence with Carr Wash			A&Ww			FBC			FC	AgI	AgL
SP	Rattlesnake ~~Canyon~~ Creek	Headwaters to confluence with Brush Canyon		A&Wc				FBC			FC		AgL
SP	Rattlesnake ~~Canyon~~ Creek	Below confluence with Brush Canyon to confluence with Aravaipa Creek			A&Ww			FBC			FC		AgL
SP	Redfield Canyon ~~Creek~~	Headwaters to confluence with unnamed tributary at 32°33'40"/110°18'42"		A&Wc				FBC			FC		AgL
SP	Redfield Canyon ~~Creek~~	Below confluence with unnamed tributary to confluence with the San Pedro River			A&Ww			FBC			FC		AgL
SP	Riggs Lake	32°42'28"/109°57'53"	Igneous	A&Wc				FBC			FC	AgI	AgL
SP	Rock Creek	Headwaters to confluence with Turkey Creek Alc						FBC			FC		AgL
SP	Rucker Canyon ~~Creek~~	Headwaters to confluence with Whitewater Draw		A&Wc				FBC			FC		AgL
SP	Rucker Canyon Lake	31°46'46"/109°18'30"	Shallow	A&Wc				FBC			FC		AgL
SP	San Pedro River	U.S./ Mexico Border to ~~Redington~~ Buehman Canyon			A&Ww			FBC			FC	AgI	AgL
SP	San Pedro River	From ~~Redington~~ Buehman canyon to confluence with the Gila River			A&Ww			FBC			FC		AgL
SP	Snow Flat Lake	32°39'10"/109°51'54"	Igneous	A&Wc				FBC			FC	AgI	AgL
SP	Soldier Creek	Headwaters to confluence with Post Creek at 32°40'50"/109°54'41"		A&Wc				FBC			FC		AgL
SP	Soto Canyon	Headwaters to confluence with Dixie Canyon			A&Ww			FBC			FC		AgL
SP	Swamp Springs Canyon ~~Creek~~	Headwaters to confluence with Redfield Canyon			A&Ww			FBC			FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SP	Sycamore Pond I	Fort Huachuca Military Reservation at 31°35'12"/ 110°26'11"	Sedimentary		A&Ww			FBC			FC		
SP	Sycamore Pond II	Fort Huachuca Military Reservation at 31°34'39"/ 110°26'10"	Sedimentary		A&Ww			FBC			FC		
SP	Turkey Creek	Headwaters to confluence with Aravaipa Creek			A&Ww			FBC			FC		AgL
SP	Turkey Creek	Headwaters to confluence with Rock Creek		A&Wc				FBC			FC	AgI	AgL
SP	Turkey Creek	Below confluence with Rock Creek to terminus near Willcox Playa			A&Ww			FBC			FC	AgI	AgL
SP	Unnamed Wash (EDW)	Mt. Lemmon WWTP outfall at 32°26'51"/110°45'08" to 0.25 km downstream					A&Wedw		PBC				
SP	Virgus Canyon ~~Creek~~	Headwaters to confluence with Aravaipa Creek			A&Ww			FBC			FC		AgL
SP	Walnut Gulch	Headwaters to Tombstone WWTP outfall at 31°43'47"/110°04'06"				A&We			PBC				
SP	Walnut Gulch (EDW)	Tombstone WWTP outfall to the confluence with Tombstone Wash					A&Wedw		PBC				
SP	Walnut Gulch	Tombstone Wash to confluence with San Pedro River				A&We			PBC				
SP	Ward Canyon ~~Creek~~	Headwaters to confluence with Turkey Creek		A&Wc									
SP	Whitewater Draw	Headwaters to confluence with unnamed tributary at 31°20'36"/109°43'48"				A&We			PBC				AgL
SP	Whitewater Draw	Below confluence with unnamed tributary to U.S./ Mexico border			A&Ww			FBC			FC		AgL
SP	Willcox Playa	From 32°08'19"/109°50'59" in the Sulphur Springs Valley	Sedimentary		A&Ww			FBC			FC		AgL
SP	Woodcutters Pond	Fort Huachuca Military Reservation at 31°30'09"/ 110°20'12"	Igneous		A&Ww			FBC			FC		
SR	Ackre Lake	33°37'01"/109°20'40"		A&Wc				FBC			FC	AgI	AgL
SR	Apache Lake	33°37'23"/111°12'26"	Deep		A&Ww			FBC		DWS	FC	AgI	AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
SR	Barnhardt Creek	Headwaters to confluence with unnamed tributary at 34°05'37/111°26'40"		A&Wc				FBC			FC		AgL
SR	Barnhardt Creek	Below confluence with unnamed tributary to confluence with Rye Creek			A&Ww			FBC			FC		AgL
SR	Basin Lake	33°55'00"/109°26'09"	Igneous		A&Ww			FBC			FC		AgL
SR	Bear Creek	Headwaters to confluence with the Black River		A&Wc				FBC			FC	AgI	AgL
SR	Bear Wallow Creek (OAW)	Headwaters to confluence with the Black River		A&Wc				FBC			FC		AgL
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
SR	Bear Wallow Creek, North Fork (OAW)	Headwaters to confluence with Bear Wallow Creek		A&Wc				FBC			FC		AgL
SR	Bear Wallow Creek, South Fork (OAW)	Headwaters to confluence with Bear Wallow Creek		A&Wc				FBC			FC		AgL
SR	Beaver Creek	Headwaters to confluence with Black River		A&Wc				FBC			FC	AgI	AgL
SR	Big Lake	33°52'36"/109°25'33"	Igneous	A&Wc				FBC		DWS	FC	AgI	AgL
SR	Black River	Headwaters to confluence with Salt River		A&Wc				FBC		DWS	FC	AgI	AgL
SR	Black River, East Fork	From 33°51'19"/109°18'54" to confluence with the Black River		A&Wc				FBC		DWS	FC	AgI	AgL
SR	Black River, North Fork of East Fork	Headwaters to confluence with ~~Black River, East Fork~~ Boneyard Creek		A&Wc				FBC		DWS	FC	AgI	AgL
SR	Black River, West Fork	Headwaters to confluence with the Black River		A&Wc				FBC		DWS	FC	AgI	AgL
SR	Bloody Tanks Wash	Headwaters to Schultze Ranch Road				A&We			PBC				AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Edww	FBC	PBC	DWS	FC	AgI	AgL
SR	Bloody Tanks Wash	Schultze Ranch Road to confluence with Miami Wash				A&We			PBC				
SR	Boggy Creek	Headwaters to confluence with Centerfire Creek		A&Wc				FBC			FC	AgI	AgL
SR	Boneyard Creek	Headwaters to confluence with Black River, East Fork		A&Wc				FBC			FC	AgI	AgL
SR	Boulder Creek	Headwaters to confluence with LaBarge Creek			A&Ww			FBC			FC		
SR	Campaign Creek	Headwaters to Roosevelt Lake			A&Ww			FBC			FC		AgL
SR	Canyon Creek	Headwaters to the White Mountain Apache Reservation boundary		A&Wc				FBC		DWS	FC	AgI	AgL
SR	Canyon Lake	33°32'44"/111°26'19"	Deep		A&Ww			FBC		DWS	FC	AgI	AgL
SR	Centerfire Creek	Headwaters to confluence with the Black River		A&Wc				FBC			FC	AgI	AgL
SR	Chambers Draw Creek	Headwaters to confluence with the North Fork of the East Fork of Black River		A&Wc				FBC			FC		AgL
SR	Cherry Creek	Headwaters to confluence with unnamed tributary at 34°05'09"/110°56'07"		A&Wc				FBC			FC	AgI	AgL
SR	Cherry Creek	Below unnamed tributary to confluence with the Salt River			A&Ww			FBC			FC	AgI	AgL
SR	Christopher Creek	Headwaters to confluence with Tonto Creek		A&Wc				FBC			FC	AgI	AgL
SR	Cold Spring Canyon Creek	Headwaters to confluence with unnamed tributary at 33°49'50"/110°52'58"		A&Wc				FBC			FC		AgL
SR	Cold Spring Canyon Creek	Below confluence with unnamed tributary to confluence with Cherry Creek			A&Ww			FBC			FC		AgL
SR	Conklin Creek	Headwaters to confluence with the Black River		A&Wc				FBC			FC	AgI	AgL
SR	Coon Creek	Headwaters to confluence with unnamed tributary at 33°46'41"/110°54'26"		A&Wc				FBC			FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Eedww	FBC	PBC	DWS	FC	AgI	AgL
SR	Coon Creek	Below confluence with unnamed tributary to confluence with Salt River			A&Ww			FBC			FC		AgL
SR	Corduroy Creek	Headwaters to confluence with Fish Creek		A&Wc				FBC			FC	AgI	AgL
SR	Coyote Creek	Headwaters to confluence with the Black River, East Fork		A&Wc				FBC			FC	AgI	AgL
SR	Crescent Lake	33°54'38"/109°25'18"	Shallow	A&Wc				FBC			FC	AgI	AgL
SR	Deer Creek	Headwaters to confluence with the Black River, East Fork		A&Wc				FBC			FC		AgL
SR	Del Shay Creek	Headwaters to confluence with Gun Creek			A&Ww			FBC			FC		AgL
SR	Devils Chasm Creek	Headwaters to confluence with unnamed tributary at 33°48'46" /110°52'35"		A&Wc				FBC			FC		AgL
SR	Devils Chasm Creek	Below confluence with unnamed tributary to confluence with Cherry Creek			A&Ww			FBC			FC		AgL
SR	Dipping Vat Reservoir	33°55'47"/109°25'31"	Igneous		A&Ww			FBC			FC		AgL
SR	Double Cienega Creek	Headwaters to confluence with Fish Creek		A&Wc									
SR	Fish Creek	Headwaters to confluence with the Black River		A&Wc				FBC			FC	AgI	AgL
SR	Fish Creek	Headwaters to confluence with the Salt River			A&Ww			FBC			FC		
SR	Gold Creek	Headwaters to confluence with unnamed tributary at 33°59'47"/111°25'10"		A&Wc				FBC			FC		AgL
SR	Gold Creek	Below confluence with unnamed tributary to confluence with Tonto Creek			A&Ww			FBC			FC		AgL
SR	Gordon Canyon Creek	Headwaters to confluence with Hog Canyon		A&Wc				FBC			FC		AgL
SR	Gordon Canyon Creek	Below confluence with Hog Canyon to confluence with Haigler Creek			A&Ww			FBC			FC		AgL
SR	Greenback Creek	Headwaters to confluence with Tonto Creek			A&Ww			FBC			FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Eedww	FBC	PBC	DWS	FC	AgI	AgL
SR	Haigler Creek	Headwaters to confluence with unnamed tributary at 34°12'23"/111°00'15"		A&Wc				FBC			FC	AgI	AgL
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
SR	Haigler Creek	Below confluence with unnamed tributary to confluence with Tonto Creek			A&Ww			FBC			FC	AgI	AgL
SR	Hannagan Creek	Headwaters to confluence with Beaver Creek		A&Wc				FBC			FC		AgL
SR	Hay Creek (OAW)	Headwaters to confluence with the Black River, West Fork		A&Wc				FBC			FC		AgL
SR	Home Creek	Headwaters to confluence with the Black River, West Fork		A&Wc				FBC			FC		AgL
SR	Horse Creek	Headwaters to confluence with the Black River, West Fork		A&Wc				FBC			FC		AgL
SR	Horse Camp Creek	Headwaters to confluence with unnamed tributary at 33°54'00"/110°50'07"		A&Wc				FBC			FC		AgL
SR	Horse Camp Creek	Below confluence with unnamed tributary to confluence with Cherry Creek			A&Ww			FBC			FC		AgL
SR	Horton Creek	Headwaters to confluence with Tonto Creek		A&Wc				FBC			FC	AgI	AgL
SR	Houston Creek	Headwaters to confluence with Tonto Creek			A&Ww			FBC			FC		AgL
SR	Hunter Creek	Headwaters to confluence with Christopher Creek		A&Wc				FBC			FC		AgL
SR	LaBarge Creek	Headwaters to Canyon Lake			A&Ww			FBC			FC		
SR	Lake Sierra Blanca	33°52'25"/109°16'05"		A&Wc				FBC			FC	AgI	AgL
SR	Miami Wash	Headwaters to confluence with Pinal Creek				A&We			PBC				
SR	Mule Creek	Headwaters to confluence with Canyon Creek		A&Wc				FBC		DWS	FC	AgI	AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
SR	Open Draw Creek	Headwaters to confluence with the East Fork of Black River		A&Wc				FBC			FC		AgL
SR	P B Creek	Headwaters to Forest Service Road #203 at 33°57'08"/110°56'12"		A&Wc				FBC			FC		AgL
SR	P B Creek	Below Forest Service Road #203 to Cherry Creek			A&Ww			FBC			FC		AgL
SR	Pinal Creek	Headwaters to confluence with unnamed EDW wash (Globe WWTP) at 33°25'29"/110°48'20"				A&We			PBC				AgL
SR	Pinal Creek (EDW)	Confluence with unnamed EDW wash (Globe WWTP) to 33°26'55"/110°49' 25"					A&Wedw		PBC				
SR	Pinal Creek	From 33°26'55"/110°49'25" to Lower Pinal Creek water treatment plant outfall #001 at 33°31'04"/ 110°51'55"				A&We			PBC				AgL
SR	Pinal Creek	From Lower Pinal Creek WTP outfall # to See Ranch Crossing at 33°32'25"/110°52'28"					A&Wedw		PBC				
SR	Pinal Creek	From See Ranch Crossing to confluence with unnamed tributary at 33°35'28"/110°54'31"			A&Ww			FBC					
SR	Pinal Creek	From unnamed tributary to confluence with Salt River			A&Ww			FBC			FC		
SR	Pine Creek	Headwaters to confluence with the Salt River			A&Ww			FBC			FC		
SR	Pinto Creek	Headwaters to confluence with unnamed tributary at 33°19'27"/110°54'58"		A&Wc				FBC			FC	AgI	AgL
SR	Pinto Creek	Below confluence with unnamed tributary to Roosevelt Lake			A&Ww			FBC			FC	AgI	AgL
SR	~~Pool~~ Pole Corral Lake	33°30'38"/110°00'15"	Igneous		A&Ww			FBC			FC	AgI	AgL
SR	Pueblo Canyon Creek	Headwaters to confluence with unnamed tributary at 33°50'23"/110°51'37"		A&Wc				FBC			FC		AgL
SR	Pueblo Canyon Creek	Below confluence with unnamed tributary to confluence with Cherry Creek			A&Ww			FBC			FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
SR	Reevis Creek	Headwaters to confluence with Pine Creek			A&Ww			FBC			FC		
SR	Reservation Creek	Headwaters to confluence with the Black River		A&Wc				FBC			FC		AgL
SR	Reynolds Creek	Headwaters to confluence with Workman Creek		A&Wc				FBC			FC		AgL
SR	Roosevelt Lake	33°52'17"/111°00'17"	Deep		A&Ww			FBC		DWS	FC	AgI	AgL
SR	Russell Gulch	FromHeadwaters to confluence with Miami Wash				A&We			PBC				
SR	Rye Creek	Headwaters to confluence with Tonto Creek						A&Ww					
SR	Saguaro Lake	33°33'44"/111°30'55"	Deep		A&Ww			FBC		DWS	FC	AgI	AgL
SR	Salome Creek	Headwaters to confluence with the Salt River			A&Ww			FBC			FC	AgI	AgL
SR	Salt House Lake	33°57'04"/109°20'11"	Igneous		A&Ww			FBC			FC		AgL
SR	Salt River	White Mountain Apache Reservation Boundary at 33°48'52"/110°31'33" to Roosevelt Lake			A&Ww			FBC			FC		AgL
SR	Salt River	Theodore Roosevelt Dam to 2 km below Granite Reef Dam			A&Ww			FBC		DWS	FC	AgI	AgL
SR	Slate Creek	Headwaters to confluence with Tonto Creek			A&Ww			FBC			FC		AgL
SR	Snake Creek (OAW)	Headwaters to confluence with the Black River		A&Wc				FBC			FC		AgL
SR	Spring Creek	Headwaters to confluence with Tonto Creek			A&Ww			FBC			FC		AgL
SR	Stinky Creek (OAW)	Headwaters to confluence with the Black River, West Fork		A&Wc				FBC			FC		AgL
SR	Thomas Creek	Headwaters to confluence with Beaver Creek		A&Wc				FBC			FC		AgL
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Eedww	FBC	PBC	DWS	FC	AgI	AgL
SR	Thompson Creek	Headwaters to confluence with the West Fork of the Black River		A&Wc				FBC			FC		AgL
SR	Tonto Creek	Headwaters to confluence with unnamed tributary at 34°18'11"/111°04'18"		A&Wc				FBC			FC	AgI	AgL
SR	Tonto Creek	Below confluence with unnamed tributary to Roosevelt Lake			A&Ww			FBC			FC	AgI	AgL
SR	Turkey Creek	Headwaters to confluence with Rock Creek		A&Wc				FBC			FC		
SR	Wildcat Creek	Headwaters to confluence with Centerfire Creek		A&Wc				FBC			FC		AgL
SR	Willow Creek	Headwaters to confluence with Beaver Creek		A&Wc				FBC			FC		AgL
SR	Workman Creek	Headwaters to confluence with Reynolds Creek		A&Wc				FBC			FC	AgI	AgL
SR	Workman Creek	Below confluence with Reynolds Creek to confluence with Salome Creek			A&Ww			FBC			FC	AgI	AgL
UG	Apache Creek	Headwaters to confluence with the Gila River			A&Ww			FBC			FC		AgL
UG	Ash Creek	Headwaters to confluence with unnamed tributary at 32°46'15"/109°51'45"		A&Wc				FBC			FC		AgL
UG	Ash Creek	Below confluence with unnamed tributary to confluence with the Gila River			A&Ww			FBC			FC		AgL
UG	Bennett Wash	Headwaters to the Gila River				A&We			PBC				
UG	Bitter Creek	Headwaters to confluence with the Gila River			A&Ww			FBC			FC		
UG	Blue River	Headwaters to confluence with Strayhorse Creek at 33°29'02"/109°12'14"		A&Wc				FBC			FC	AgI	AgL
UG	Blue River	Below confluence with Strayhorse Creek to confluence with San Francisco River			A&Ww			FBC			FC	AgI	AgL
UG	Bonita Creek (OAW)	San Carlos Indian Reservation boundary to confluence with the Gila River			A&Ww			FBC		DWS	FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
UG	~~Buckalou~~ Buckelew Creek	Headwaters to confluence with Castle Creek		A&Wc				FBC			FC		AgL
UG	Campbell Blue Creek	Headwaters to confluence with the Blue River		A&Wc				FBC			FC		AgL
UG	Castle Creek	Headwaters to confluence with Campbell Blue Creek		A&Wc				FBC			FC		AgL
UG	Cave Creek (OAW)	Headwaters to confluence with South Fork Cave Creek		A&Wc				FBC			FC	AgI	AgL
UG	Cave Creek (OAW)	Below confluence with South Fork Cave Creek to Coronado National Forest boundary			A&Ww			FBC			FC	AgI	AgL
UG	Cave Creek	Below Coronado National Forest boundary to New Mexico border			A&Ww			FBC			FC	AgI	AgL
UG	Cave Creek, South Fork	Headwaters to confluence with Cave Creek		A&Wc				FBC			FC	AgI	AgL
UG	Chase Creek	Headwaters to the Phelps-Dodge Morenci Mine			A&Ww			FBC			FC		AgL
UG	Chase Creek	Below the Phelps-Dodge Morenci Mine to confluence with San Francisco River				A&We			PBC				
UG	Chitty Canyon Creek	Headwaters to confluence with Salt House Creek		A&Wc				FBC			FC		AgL
UG	Cima Creek	Headwaters to confluence with Cave Creek		A&Wc				FBC			FC		AgL
UG	Cluff ~~Ranch Pond~~ Reservoir #1	32°48'55"/109°50'46"	Sedimentary		A&Ww			FBC			FC	AgI	AgL
UG	Cluff ~~Ranch Pond~~ Reservoir #3	32°48'21"/109°51'46"	Sedimentary		A&Ww			FBC			FC	AgI	AgL
UG	Coleman Creek	Headwaters to confluence with Campbell Blue Creek		A&Wc				FBC			FC		AgL
UG	Dankworth Lake	32°43'13"/109°42'17"	Sedimentary	A&Wc				FBC			FC		
UG	Deadman Canyon Creek	Headwaters to confluence with unnamed tributary at 32°43'50"/109°49'03"		A&Wc				FBC		DWS	FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
UG	Deadman Canyon Creek	Below confluence with unnamed tributary to confluence with Graveyard Wash			A&Ww			FBC		DWS	FC		AgL
UG	Eagle Creek	Headwaters to confluence with unnamed tributary at 33°22'32"/109°29'43"		A&Wc				FBC		DWS	FC	AgI	AgL
UG	Eagle Creek	Below confluence with unnamed tributary to confluence with the Gila River						A&Ww					
UG	East Eagle Creek	Headwaters to confluence with Eagle Creek		A&Wc				FBC			FC		AgL
UG	East Turkey Creek	Headwaters to confluence with unnamed tributary at 31°58'22"/109°12'20"		A&Wc				FBC			FC		AgL
UG	East Turkey Creek	Below confluence with unnamed tributary to terminus near San Simon River			A&Ww			FBC			FC		AgL
UG	East Whitetail	Headwaters to terminus near San Simon River			A&Ww			FBC			FC		AgL
UG	Emigrant Canyon	Headwaters to terminus near San Simon River			A&Ww			FBC			FC		AgL
UG	Evans Pond #1	32°49'19"/109°51'12"	Sedimentary		A&Ww			FBC			FC	AgI	AgL
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
UG	Evans Pond #2	32°49'14"/109°51'09"	Sedimentary		A&Ww			FBC			FC	AgI	AgL
UG	Fishhook Creek	Headwaters to confluence with the Blue River		A&Wc				FBC			FC		AgL
UG	Foote Creek	Headwaters to confluence with the Blue River		A&Wc				FBC			FC		AgL
UG	Frye Canyon Creek	Headwaters to Frye Mesa Reservoir		A&Wc				FBC		DWS	FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
UG	Frye Canyon Creek	~~Highline Canal~~Headwaters to terminus ~~near San Simon River~~Frye Mesa reservoir to terminus at Highline Canal.			A&Ww			FBC			FC		AgL
UG	Frye Mesa Reservoir	32°45'14"/109°50'02"	Igneous	A&Wc				FBC		DWS	FC		
UG	Gibson Creek	Headwaters to confluence with Marijilda Creek		A&Wc				FBC			FC		AgL
UG	Gila River	New Mexico border to the San Carlos Indian Reservation boundary			A&Ww			FBC			FC	AgI	AgL
UG	Grant Creek	Headwaters to confluence with the Blue River		A&Wc				FBC			FC		AgL
UG	Judd Lake	33°51'15"/109°09'35"	Sedimentary	A&Wc				FBC			FC		
UG	K P Creek (OAW)	Headwaters to confluence with the Blue River		A&Wc				FBC			FC		AgL
UG	Lanphier Canyon Creek	Headwaters to confluence with the Blue River		A&Wc				FBC			FC		AgL
UG	Little Blue Creek	Headwaters to confluence with Dutch Blue Creek		A&Wc				FBC			FC		AgL
UG	Little Blue Creek	Below confluence with Dutch Blue Creek to confluence with Blue Creek			A&Ww			FBC			FC		AgL
UG	Little Creek	Headwaters to confluence with the San Francisco River		A&Wc				FBC			FC		
UG	~~Lower~~ George's ~~Reservoir~~ Tank	33°51'24"/109°08'30"	Sedimentary	A&Wc				FBC			FC		AgL
UG	Luna Lake	33°49'50"/109°05'06"	Sedimentary	A&Wc				FBC			FC		AgL
UG	Marijilda Creek	Headwaters to confluence with Gibson Creek		A&Wc				FBC			FC		AgL
UG	Marijilda Creek	Below confluence with Gibson Creek to confluence with Stockton Wash			A&Ww			FBC			FC	AgI	AgL
UG	Markham Creek	Headwaters to confluence with the Gila River			A&Ww			FBC			FC		AgL
UG	Pigeon Creek	Headwaters to confluence with the Blue River			A&Ww			FBC			FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
UG	Raspberry Creek	Headwaters to confluence with the Blue River		A&Wc				FBC			FC		
UG	Roper Lake	32°45'23"/109°42'14"	Sedimentary		A&Ww			FBC			FC		
UG	San Francisco River	Headwaters to the New Mexico border		A&Wc				FBC			FC	AgI	AgL
UG	San Francisco River	New Mexico border to confluence with the Gila River			A&Ww			FBC			FC	AgI	AgL
UG	San Simon River	Headwaters to confluence with the Gila River				A&We			PBC				AgL
UG	Sheep Tank	32°46'14"/109°48'09"	Sedimentary		A&Ww			FBC			FC		AgL
UG	Smith Pond	32°49'15"/109°50'36"	Sedimentary		A&Ww			FBC			FC		
UG	Squaw Creek	Headwaters to confluence with Thomas Creek		A&Wc				FBC			FC		AgL
UG	Stone Creek	Headwaters to confluence with the San Francisco River		A&Wc				FBC			FC	AgI	AgL
UG	Strayhorse Creek	Headwaters to confluence with the Blue River		A&Wc				FBC			FC		
UG	Thomas Creek	Headwaters to confluence with Rousensock Creek		A&Wc				FBC			FC		AgL
UG	Thomas Creek	Below confluence with Rousensock Creek to confluence with Blue River			A&Ww			FBC			FC		AgL
UG	Tinny Pond	33°47'49"/109°04'27"	Sedimentary		A&Ww			FBC			FC		AgL
UG	Turkey Creek	Headwaters to confluence with Campbell Blue Creek		A&Wc									
VR	American Gulch	Headwaters to the Northern Gila County Sanitary District WWTP outfall at 34°14'02"/111°22'14"			A&Ww			FBC			FC	AgI	AgL
VR	American Gulch (EDW)	Below Northern Gila County Sanitary District WWTP outfall to confluence with the East Verde River					A&Wedw		PBC				
VR	Apache Creek	Headwaters to confluence with Walnut Creek			A&Ww			FBC			FC		AgL
VR	Ashbrook Wash	Headwaters to the Fort McDowell Indian Reservation boundary				A&We			PBC				

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
VR	Aspen Creek	Headwaters to confluence with Granite Creek			A&Ww			FBC			FC		
VR	Bar Cross Tank	35°00'41"/112°05'39"			A&Ww			FBC			FC		AgL
VR	Barrata Tank	35°02'43"/112°24'21"			A&Ww			FBC			FC		AgL
VR	Bartlett Lake	33°49'52"/111°37'44"	Deep		A&Ww			FBC		DWS	FC	AgI	AgL
VR	Beaver Creek	Headwaters to confluence with the Verde River			A&Ww			FBC			FC		AgL
VR	Big Chino Wash	Headwaters to confluence with Sullivan Lake				A&We			PBC				AgL
VR	Bitter Creek	Headwaters to the Jerome WWTP outfall at 34°45'12"/112°06'24"				A&We			PBC				AgL
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
VR	Bitter Creek (EDW)	Jerome WWTP outfall to the Yavapai Apache Indian Reservation boundary					A&Wedw		PBC				AgL
VR	Bitter Creek	Below the Yavapai Apache Indian Reservation boundary to confluence with the Verde River			A&Ww			FBC			FC	AgI	AgL
VR	Black Canyon Creek	Headwaters to confluence with unnamed tributary at 34°39'20"/112°05'06"		A&Wc				FBC			FC		AgL
VR	Black Canyon Creek	Below confluence with unnamed tributary to confluence with the Verde River			A&Ww			FBC			FC		AgL
VR	Bonita Creek	Headwaters to confluence with Ellison Creek		A&Wc				FBC			FC		
VR	Bray Creek	Headwaters to confluence with Webber Creek		A&Wc				FBC			FC		AgL
VR	Camp Creek	Headwaters to confluence with the ~~Verde River~~ Sycamore Creek			A&Ww			FBC			FC		AgL
VR	Cereus Wash	Headwaters to the Fort McDowell Indian Reservation boundary				A&We			PBC				

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
VR	Chase Creek	Headwaters to confluence with the East Verde River		A&Wc				FBC		DWS	FC		
VR	Clover Creek	Headwaters to confluence withHeadwaters of West Clear Creek		A&Wc				FBC			FC		AgL
VR	Coffee Creek	Headwaters to confluence with Spring Creek			A&Ww			FBC			FC		AgL
VR	Colony Wash	Headwaters to the Fort McDowell Indian Reservation boundary				A&We			PBC				
VR	Dead Horse Lake	34°45'08"/112°00'42"	Shallow		A&Ww			FBC			FC		
VR	Deadman Creek	Headwaters to Horseshoe Reservoir			A&Ww			FBC			FC		AgL
VR	Del Monte ~~Wash~~ Gulch	Headwaters to confluence with City of Cottonwood WWTP outfall 002 at 34°43'57"/112°02'46"				A&We			PBC				
VR	Del Monte ~~Wash~~ Gulch (EDW)	City of Cottonwood WWTP outfall 002 at 34°43'57"/ 112°02'46" to confluence with ~~Verde River~~ Blowout Creek					A&Wedw		PBC				
VR	Del Rio Dam Lake	34°48'55"/112°28'03"	Sedimentary		A&Ww			FBC			FC		AgL
VR	Dry Beaver Creek	Headwaters to confluence with Beaver Creek			A&Ww			FBC			FC	AgI	AgL
VR	Dry Creek (EDW)	Sedona Ventures WWTP outfall at 34°50'02"/ 111°52'17" to 34°48'12"/111°52'48"					A&Wedw		PBC				
VR	Dude Creek	Headwaters to confluence with the East Verde River		A&Wc				FBC			FC	AgI	AgL
VR	East Verde River	Headwaters to confluence with Ellison Creek		A&Wc				FBC		DWS	FC	AgI	AgL
VR	East Verde River	Below confluence with Ellison Creek to confluence with the Verde River			A&Ww			FBC		DWS	FC	AgI	AgL
VR	Ellison Creek	Headwaters to confluence with the East Verde River		A&Wc				FBC			FC		AgL
VR	Fossil Creek (OAW)	Headwaters to confluence with the Verde River			A&Ww			FBC			FC		AgL
VR	Fossil Springs (OAW)	34°25'24"/111°34'27"			A&Ww			FBC		DWS	FC		

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Edww	FBC	PBC	DWS	FC	AgI	AgL
VR	Foxboro Lake	34°53'42"/111°39'55"			A&Ww			FBC			FC		AgL
VR	Fry Lake	35°03'45"/111°48'04"			A&Ww			FBC			FC		AgL
VR	Gap Creek	Headwaters to confluence with Government Spring		A&Wc				FBC			FC		AgL
VR	Gap Creek	Below Government Spring to confluence with the Verde River			A&Ww			FBC			FC		AgL
VR	Garrett Tank	35°18'57"/112°42'20"			A&Ww			FBC			FC		AgL
VR	Goldwater Lake, Lower	34°29'56"/112°27'17"	Sedimentary	A&Wc				FBC		DWS	FC		
VR	Goldwater Lake, Upper	34°29'52"/112°26'59"	Igneous	A&Wc				FBC		DWS	FC		
VR	Granite Basin Lake	34°37'01"/112°32'58"	Igneous	A&Wc				FBC			FC	AgI	AgL
VR	Granite Creek	Headwaters to Watson Lake		A&Wc				FBC			FC	AgI	AgL
VR	Granite Creek	Below Watson Lake to confluence with the Verde River						A&Ww					
VR	Green Valley Lake (EDW)	34°13'54"/111°20'45"	Urban				A&Edww		PBC		FC		
VR	Heifer Tank	35°20'27"/112°32'59"			A&Ww			FBC			FC		AgL
VR	~~Hell~~ Hells Canyon Tank	35°04'59"/112°24'07"	Igneous		A&Ww			FBC			FC		AgL
VR	Homestead Tank	35°21'24"/112°41'36"	Igneous		A&Ww			FBC			FC		AgL
VR	Horse Park Tank	34°58'15"/111°36'32"			A&Ww			FBC			FC		AgL
VR	Horseshoe Reservoir	34°00'25"/111°43'36"	Sedimentary		A&Ww			FBC			FC	AgI	AgL
VR	Houston Creek	Headwaters to confluence with the Verde River			A&Ww			FBC			FC		AgL
VR	Huffer Tank	34°27'46"/111°23'11"			A&Ww			FBC			FC		AgL
VR	J.D. Dam Lake	35°04'02"/112°01'48"	Shallow	A&Wc				FBC			FC	AgI	AgL
VR	Jacks Canyon ~~Wash~~	Headwaters to Big Park WWTP outfall at 34°45'46"/ 111°45'51"				A&We			PBC				

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedww	FBC	PBC	DWS	FC	AgI	AgL
VR	Jacks Canyon ~~Wash~~ (EDW)	Below Big Park WWTP outfall to confluence with Dry Beaver Creek					A&Wedw		PBC				
~~Watershed~~	~~Surface Waters~~	~~Segment Description and Location (Latitude and Longitudes are in NAD 83)~~	~~Lake Category~~	~~Aquatic and Wildlife~~	~~Human Health~~	~~Agricultural~~							
VR	Lime Creek	Headwaters to Horseshoe Reservoir			A&Ww			FBC			FC		AgL
VR	Masonry Number 2 Reservoir	35°13'32"/112°24'10"		A&Wc				FBC			FC	AgI	AgL
VR	McLellan Reservoir	35°13'09"/112°17'06"	Igneous		A&Ww			FBC			FC	AgI	AgL
VR	Meath Dam Tank	35°07'52"/112°27'35"			A&Ww			FBC			FC		AgL
VR	Mullican Place Tank	34°44'16"/111°36'10"	Igneous		A&Ww			FBC			FC		AgL
VR	Oak Creek (OAW)	Headwaters to confluence with unnamed tributary at 34°59'15"/111°44'47"		A&Wc				FBC		DWS	FC	AgI	AgL
VR	Oak Creek (OAW)	Below confluence with unnamed tributary to confluence with Verde River			A&Ww			FBC		DWS	FC	AgI	AgL
VR	Oak Creek, West Fork (OAW)	Headwaters to confluence with Oak Creek		A&Wc				FBC			FC		AgL
VR	Odell Lake	34°56'5"/111°37'53"	Igneous	A&Wc				FBC			FC		
VR	Peck's Lake	34°46'51"/112°02'01"	Shallow		A&Ww			FBC			FC	AgI	AgL
VR	Perkins Tank	35°06'42"/112°04'12"	Shallow	A&Wc				FBC			FC		AgL
VR	Pine Creek	Headwaters to confluence with unnamed tributary at 34°21'51"/111°26'49"		A&Wc				FBC		DWS	FC	AgI	AgL
VR	Pine Creek	Below confluence with unnamed tributary to confluence with East Verde River			A&Ww			FBC		DWS	FC	AgI	AgL
VR	Red Creek	Headwaters to confluence with the Verde River			A&Ww			FBC			FC		AgL

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Edww	FBC	PBC	DWS	FC	AgI	AgL
VR	Reservoir #1	35°13'5"/111°50'09"	Igneous		A&Ww			FBC			FC		
VR	Reservoir #2	35°13'17"/111°50'39"	Igneous		A&Ww			FBC			FC		
VR	Roundtree Canyon Creek	Headwaters to confluence with Tangle Creek			A&Ww			FBC			FC		AgL
VR	Scholze Lake	35°11'53"/112°00'37"	Igneous	A&Wc				FBC			FC		AgL
VR	Spring Creek	Headwaters to confluence with unnamed tributary at 34°57'23"/111°57'21"		A&Wc				FBC			FC	AgI	AgL
VR	Spring Creek	Below confluence with unnamed tributary to confluence with Oak Creek			A&Ww			FBC			FC	AgI	AgL
VR	Steel Dam Lake	35°13'36"/112°24'54"	Igneous	A&Wc				FBC			FC		AgL
VR	Stehr Lake	34°22'01"/111°40'02"	Sedimentary		A&Ww			FBC			FC		AgL
~~VR~~	~~Stone Dam Lake~~	~~35°13'32"/112°24'10"~~		~~A&Wc~~				~~FBC~~			~~FC~~	~~AgI~~	~~AgL~~
VR	Stoneman Lake	34°46'47"/111°31'14"	Shallow	A&Wc				FBC			FC	AgI	AgL
VR	Sullivan Lake	34°51'42"/112°27'51"			A&Ww			FBC			FC	AgI	AgL
VR	Sycamore Creek	Headwaters to confluence with unnamed tributary at 35°03'41"/111°57'31"		A&Wc				FBC			FC	AgI	AgL
VR	Sycamore Creek	Below confluence with unnamed tributary to confluence with Verde River			A&Ww			FBC			FC	AgI	AgL
VR	Sycamore Creek	Headwaters to confluence with Verde River at 33°37'55"/111°39'58"			A&Ww			FBC			FC	AgI	AgL
VR	Sycamore Creek	Headwaters to confluence with Verde River at 34°04'42"/111°42'14"			A&Ww			FBC			FC		AgL
VR	Tangle Creek	Headwaters to confluence with Verde River			A&Ww			FBC			FC	AgI	AgL
VR	Trinity Tank	35°27'44"/112°48'01"			A&Ww			FBC			FC		AgL
VR	Unnamed Wash	Flagstaff Meadows WWTP outfall at '35°13'59"/ 111°48'35" to Volunteer Wash					A&Wedw		PBC				

Watershed	Surface Waters	Segment Description and Location (Latitude and Longitudes are in NAD 83)	Lake Category	Aquatic and Wildlife				Human Health				Agricultural	
				A&Wc	A&Ww	A&We	A&Wedw	FBC	PBC	DWS	FC	AgI	AgL
VR	Verde River	~~From~~ Above Bartlett Dam from confluence of Chino Wash and Granite Creek to Bartlett Lake Dam			A&Ww			FBC			FC	AgI	AgL
VR	Verde River	Below Bartlett Lake Dam to Salt River			A&Ww			FBC		DWS	FC	AgI	AgL
VR	Walnut Creek	Headwaters to confluence with Big Chino Wash			A&Ww			FBC			FC		AgL
VR	Watson Lake	34°34'58"/112°25'26"	Igneous					A&Ww					
VR	Webber Creek	Headwaters to confluence with the East Verde River		A&Wc				FBC			FC		AgL
VR	West Clear Creek	Headwaters to confluence with Meadow Canyon		A&Wc				FBC			FC		AgL
VR	West Clear Creek	Below confluence with Meadow Canyon to confluence with the Verde River			A&Ww			FBC			FC	AgI	AgL
VR	Wet Beaver Creek	Headwaters to unnamed springs at 34°41'17"/ 111°34'34"		A&Wc				FBC			FC	AgI	AgL
VR	Wet Beaver Creek	Below unnamed springs to confluence with Dry Beaver Creek			A&Ww			FBC			FC	AgI	AgL
VR	Whitehorse Lake	35°06'59"/112°00'48"	Igneous	A&Wc				FBC		DWS	FC	AgI	AgL
VR	Williamson Valley Wash	Headwaters to confluence with Mint Wash				A&We			PBC				AgL
VR	Williamson Valley Wash	From confluence of Mint Wash to 10.5 km downstream			A&Ww			FBC			FC		AgL
VR	Williamson Valley Wash	From 10.5 km downstream of Mint Wash confluence to confluence with Big Chino Wash				A&We			PBC				AgL
VR	Williscraft Tank	35°11'22"/112°35'40"			A&Ww			FBC			FC		AgL
VR	Willow Creek	Above Willow Creek Reservoir		A&Wc				FBC			FC		AgL
VR	Willow Creek	Below Willow Creek Reservoir to confluence with Granite Creek			A&Ww			FBC			FC		AgL
VR	Willow Creek Reservoir	34°36'17"/112°26'19"	Shallow		A&Ww			FBC			FC	AgI	AgL
VR	Willow Valley Lake	34°41'08"/111°20'02"	Sedimentary		A&Ww			FBC			FC		AgL

Watersheds

BW = Bill Williams

CG = Colorado – Grand Canyon

CL = Colorado – Lower Gila

LC = Little Colorado

MG = Middle Gila

SC = Santa Cruz – Rio Magdelena – Rio Sonoyta

SP = San Pedro – Willcox Playa – Rio Yaqui

SR = Salt River

UG = Upper Gila

VR = Verde River

Other Abbreviations

WWTP = Wastewater Treatment Plant

Km = kilometers

Appendix C. Site-Specific Standards

Watershed	Surface Water	Surface Water Description & Location	Parameter	Site-Specific Criterion
LC	Rio de Flag (EDW)	Flagstaff WWTP outfall to the confluence with San Francisco Wash at 35°14'04"/111°28'02.5"	Copper (D)	36 µg/L (A&Wedw)
CL	Yuma East Wetlands	From inlet culvert from Colorado River into restored channel to Ocean Bridge	Selenium (T)	2.2 ~~mg/L~~µg/L (A&Ww chronic)
			Total residual chlorine	33 µg/L (A&Ww acute)
				20 µg/L (A&Ww chronic)
SR	Pinto Creek	From confluence of Ellis Ranch tributary at 33°19'26.7"/110°54'57.5" to the confluence of West Fork of Pinto Creek at 33°27'32.3"/111°00'19.7"	Copper (D)	34 µg/L (A&Ww acute for hardness values below 268 mg/L)
				34 µg/L (A&Ww chronic)
~~CG~~	~~Bright Angel Wash~~	~~South Rim Grand Canyon National Park WWTP at 36°02'59"/112°09'02" to Coconino Wash~~	~~Copper (D)~~	~~42.5 µg/L (A&W edw)~~
~~CG~~	~~Transept Canyon~~	~~North Rim Grand Canyon WWTP at 36°12'20"/112°03'35" to1km downstream~~	~~Copper (D)~~	~~42.5 µg/L (A&W edw)~~