EPA REGION 7 REVIEW OF 2018 RULE REVISIONS TO MISSOURI WATER QUALITY STANDARDS

Under Section 303(c) of the Clean Water Act (CWA), 33 U.S.C. § 1313(c) and Title 40, Part 131.5 of the Code of Federal Regulations, states must review their WQS at least every three years and submit any new or revised WQS to the EPA for review and approval or disapproval. This review involves a determination of whether:

- The state has adopted designated uses consistent with the requirements of the CWA;
- The state has adopted criteria that protect the designated water uses;
- Whether the state has adopted an antidegradation policy that is consistent with 40 C.F.R. § 131.12, and whether any State adopted antidegradation implementation methods are consistent with § 131.12;
- Whether any state adopted WQS variance provision is consistent with 40 C.F.R. § 131.14;
- Whether any state adopted provision authorizing the use of schedules of compliance for water quality-based effluent limits in National Pollutant Discharge Elimination System (NPDES) permits is consistent with 40 C.F.R. § 131.15;
- The state has followed its legal procedures for revising or adopting standards;
- The state standards that do not include the uses specified in Section 101(a)(2) of the CWA are based upon appropriate technical and scientific data and analyses;
- The state submission meets the requirements included in 40 C.F.R. § 131.6.

Regulatory language from the April 13, 2018, submission is contained within the boxes below. Bold text below represents newly adopted language; strike-through and/or italic text represents newly deleted language.

I. Provisions the EPA is Approving

A. Definitions

The following definitions are approved by the EPA.

1. 10 CSR 20-7.031(1)(K): New definition for Eutrophication

(K) Eutrophication—The process by which a body of water becomes enriched in dissolved nutrients, such as nitrogen and phosphorus, that stimulate the excessive growth of algae and other plants. Eutrophication may be accelerated by human activities.

This definition distinguishes between nutrients dissolved in the water column available for biological activity such as algal growth and nutrients that are bound up in living plants and sediment.

> 2. **10 CSR 20-7.031(1)**(~~[N]~~**O**) Losing stream—A stream which distributes thirty percent (30%) or more of its flow during low flow conditions through natural processes, such as through permeable geologic materials into a bedrock aquifer within two (2) miles flow distance downstream of an existing or proposed discharge. Flow measurements to determine percentage of water loss must be corrected to approximate the 7Q10 stream flow. If a stream bed or drainage way has an intermittent flow or a flow insufficient to measure in accordance with this rule, it may be determined to be a losing stream on the basis of channel development, valley configuration, vegetation development, dye tracing studies, bedrock characteristics, geographical data, and other geological factors. Losing streams are **identified**~~[listed]~~ in **the digital geospatial dataset 'LOSING_STREAM' developed by the Missouri Department of Natural Resources, Missouri Geological Survey** ~~[Table J]~~; additional streams may be determined to be losing by the Missouri Department of Natural Resources.

The MDNR revised the definition of a losing stream and deleted Table J (a list of identified losing streams in Missouri). The MDNR replaced Table J with reference in its revised definition to a digital geospatial database 'Losing Stream' published by the Missouri Department of Natural Resources, Missouri Geological Survey.

Generally, the significance of a losing stream designation by MDNR results in stricter NPDES permits to losing streams,[1] allowing discharge only where other non-discharge alternatives have been considered and determined "unacceptable" due to environmental and/or economic reasons. Losing streams additionally receive stringent limitations for BOD and TSS if permitted and are required to dechlorinate and not discharge sludge. Additionally, Losing stream discharges are required to meet the most stringent of the bacteria WQS (126 CFU/100 mL) year-round.

The EPA is approving the web-based digital geospatial database 'Losing Stream' as the MDNR submitted it to EPA on April 13, 2018. The referenced dataset as submitted to the EPA on April 13, 2018 shall be maintained by MDNR as the list of losing streams for purposes of EPA-approved water quality standards and applicable requirements of the Clean Water Act. Any changes to the list must be submitted as part of a WQS rulemaking. To alleviate any confusion and improve transparency, the State should make available via link or other means, the April 13, 2018, dataset which the EPA approves today.

EPA notes the Missouri 10 CSR 20-7.015 Effluent Regulations still refer to Table J and should be updated and refer to the April 13, 2018, dataset to be consistent:

> "A list of known losing streams is available in the Water Quality Standards, 10 CSR 20-7.031 Table J—Losing Streams."

[1] Missouri Effluent Regulations 10 CSR 20-7.015(4)

3. **10 CSR 20-7.031(1)(V)**: Revised definition for "Ozark streams."

   *[(U)]***(V)** Ozark streams—Streams lying within the Ozark faunal region as described in the *Aquatic Community Classification System for Missouri*, **1989, Aquatic Series No. 19,** Missouri Department of Conservation, *[1989]* **Jefferson City, MO 65109, which is hereby incorporated by reference and does not include any later amendments or additions. The department shall maintain a copy of the referenced documents and shall make them available to the public for inspection and copying at no more than the actual cost of reproduction**.

This revision to the definition of Ozark streams simply provides the full citation for the document used to identify Ozark streams in Missouri and provides to the public a means by which they can access this document. Similar to the EPA's recommendation regarding the losing streams dataset, Missouri may wish to include a link or version of this document that is readily accessible to the public.

4. **10 CSR 20-7.031(1)**(~~*[BB]*~~**CC**) Water hardness—The total concentration of calcium and magnesium ions expressed as calcium carbonate. For purposes of this rule, hardness will be **the median** ~~*[determined by the lower quartile (twenty-fifth percentile)]*~~ value of a representative number of samples from the water ~~*[body]*~~ in question or from ~~*[a]*~~ similar water**s** ~~*[body]*~~ at the appropriate stream flow conditions **within the same ecoregion**.

This revision changes the derivation methodology for hardness at 10 CSR 20-7.031(1)(CC) from a lower quartile (twenty-fifth percentile) to a median (fiftieth percentile) value of representative samples. The revision also clarifies that representative hardness samples may be collected from similar waters within the same ecoregion. The definition is used primarily for purposes of identifying hardness for hardness dependent metals criteria.

There is a concern with situations where the discharge situation is effluent dominated. In many places, stream flows under 1Q10 or 7Q10 conditions are very low and stream hardness may be altered or dominated by the hardness of the discharge water. In these cases, the hardness of the combined flow should be considered.

The EPA understands that the state intends to interpret the language, "at the appropriate stream flow condition" to mean the design flow.[2] Because the design flow is already intended to represent worst-case conditions, the EPA considers the approach of calculating the criteria for hardness dependent metals (Table A.2), using a median of representative hardness data would generally be protective of the aquatic life use. Given that the provision specifies that samples must be representative, the EPA would expect that establishment of site-specific criteria would be a prudent and effective solution.

[2] Email from John Hoke to Ann Lavaty dated June 19, 2019.

Today the EPA is approving this provision as consistent with the CWA and EPA's implementing regulations at 131.11(b)(1)(iii).

B. 10 CSR 20-7.031(2)(E) Missouri Use Designation Dataset (MUDD)

10 CSR 20-7.031(2)(E) directs the MDNR to maintain the geospatial dataset (MUDD) described at 10 CSR 20-7.031(1)(Q). The revisions made to the MUDD updates the data set used to implement Missouri's use classification system; the MUDD documents the names and locations of the state's rivers, streams, lakes and reservoirs which have been assigned designated uses.

According to the MDNR's Regulatory Impact Report for this WQS rulemaking, the MDNR's MUDD update contains revisions that use more accurate GIS data to refine the delineation of start and end points of water body features, update and incorporate water body features according to 10 CSR 20-7.031(2) and recalculate stream mileages and lake acreages. Data and information contained in the 1:100,000 and 1:24,000 National Hydrography Dataset (NHD), Missouri's Aquatic Gap project, and supplemental information such as Digital Orthophoto Quarter Quads (DOQQs), other high-resolution imagery and maps, and information contained in permit applications or other sources were used for these revisions.

The MDNR submitted PDF summary files in their WQS submission that are reports from their WQS database and highlight changes to the business data (metadata) that are also reflected in the GIS files within the MUDD. Many of the revisions found in the summary documents are the renaming of water bodies to reflect local names or to maintain consistency in naming conventions in the dataset (e.g., "Cr." becomes "Creek"). Other revisions included are updates to mileage based on new GIS calculations or updates in To/From locations which can impact both the legal description and/or county fields. Two documents titled "justification-comments" for Tables G and H show the changes made and the justification or rationale why the change was made. Finally, a document named "proposed-removals-100K" captures actual stream segment or lake feature removals (seven stream segments totaling 1.5 miles; 19 lakes totaling 173.9 acres) and associated uses from the MUDD. These removals are most commonly either errors in the NHD line work or inappropriate application of presumed uses to features that are not waters (such as a waste treatment lagoon or tailings pond). The EPA approves the revisions made as described above and the removals as documented by the MDNR not to be actual water bodies that should be classified with designated uses and provided CWA protection.

Section 101(a)(2) of the CWA provides for an interim water quality goal of the protection and propagation of fish, shellfish and wildlife and for recreation in and on the water, where such uses are attainable. Section 303(c)(2)(A) requires that WQS "protect the public health and welfare, enhance the quality of water, and serve the purposes of [the CWA]." The EPA's WQS regulation interprets and implements these provisions by requiring states and authorized tribes to adopt WQS that protect the uses specified in Section 101(a)(2) of the CWA unless states and authorized tribes have demonstrated these uses to be unattainable, effectively creating a rebuttable presumption of attainability (40 CFR §§ 131.2; 131.5(a)(4); 131.6(a) and (f); 131.l0(g), (j) and (k)).

Tables G and H incorporate the MUDD ("8-2-13 version 1.0", now "100K Extent-Remaining") by reference and are labeled, respectively, *Lake Classifications and Use Designations* and *Stream Classifications and Use Designations.* These tables, and the referenced database, unambiguously assign the uses specified in CWA section 101(a)(2) and other uses to individual water bodies or segments thereof. The EPA approves the new use designations contained in Table G, Table H and the MUDD (100K Extent-Remaining) because assigning Section 101(a)(2) uses comports with the CWA and EPA's implementing regulations as described above. This approval encompasses the new designation of 91 additional lakes (1990.00 additional lake acres) and 250 additional stream segments (749.4 additional stream miles) for warm water aquatic habitat protection[3], human health protection (fish consumption), whole body contact recreation (Category B), secondary contact recreation[4], irrigation, and livestock and wildlife protection; one of the newly added streams in Table G is also designated with the Cold Water Habitat use, and two are designated Cool Water Habitat.

C. 10 CSR 20-7.031(3) Antidegradation

1. 10 CSR 20-7.031(3)(B)1:
(B) Tier Two…. In allowing the lowering of water quality, the state shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control before allowing any lowering of water quality. This provision allows a proposed new or modified point or nonpoint source of pollution to result in limited lowering of water quality provided that—

1. The source does not violate any of the general criteria set forth in section (**4**~~*[3]*~~) of this rule, or any of the criteria for protection of beneficial uses set forth in section (**5**~~*[4]*~~) of this rule;

Provision 1 was revised to correct referenced rule sections; previously, this rule incorrectly referenced section (3), the Antidegradation section, and section (4), the General criteria section. The rule now correctly refers to section 4, the General criteria section, and to section 5, the specific criteria section. These revisions are hereby approved.

[3] "Aquatic habitat protection uses" are applied by the state as subcategories or tiers under the broader use designation, "protection and propagation of fish, shellfish and wildlife" (10 CSR 20-7.031(1)(C)). Warm water habitat (WWH) represents the state's default use designation with respect to the protection and propagation of fish, shellfish and wildlife.

[4] The EPA is approving Missouri's adoption of secondary contact recreation as consistent with the CWA and the EPA's implementing regulations because the state adopted such a use in conjunction with whole-body contact recreation, which is protective of primary contact recreation.

2. 10 CSR 20-7.031(3)(D): The three (3) levels of protection provided by the antidegradation policy in subsections (A) through (C) of this section shall be implemented according to procedures hereby incorporated by reference and known as the "Missouri Antidegradation Rule and Implementation Procedure, ~~*[May 2, 2012]*~~**July 13, 2016**." No later amendments or additions are included. This document shall be made available to anyone upon written request to the Department of Natural Resources, Water Protection Program, Water Pollution Control Branch, PO Box 176, Jefferson City, MO 65102-0176.

10 CSR 20-7.031(3)(D) adopts a revised antidegradation implementation procedure, or AIP, by reference. On November 17, 2015, the EPA disapproved an earlier version of the AIP because application of the *de minimis* provision in the state's AIP could lead, in certain situations, to the impairment of Tier 2 waters, an outcome prohibited by 40 CFR Parts 131.12(a)(l) and 131.12(a)(2). Specifically, in assessing the need for a Tier 2 review, the AIP treated essentially all segment assimilative capacity (SAC) reductions of less than ten percent as *de minimis* changes in water quality, making no distinction between the changes caused by bioaccumulative pollutants and those caused by non-bioaccumulative pollutants. As the EPA stated in its letter, we know of no single threshold value (percentage reduction in SAC) that can be safely applied in a *de minimis* manner, and in all situations, to bioaccumulative pollutants. Depending on a water body's physical, chemical and biological properties, and on the circumstances surrounding the lowering of water quality, even a small increase in the level of a bioaccumulative pollutant may pose an unacceptable risk to aquatic organisms and/or human health.

As a potential remedy to the disapproval, the EPA indicated it would support the state's adoption of a revised AIP, either by removing the *de minimis* provision or by no longer applying this provision automatically to activities/discharges constituting sources of bioaccumulative pollutants. Under the latter option, a Tier 2 antidegradation review could be required by the state whenever a proposed activity/discharge would increase the ambient concentration of a bioaccumulative substance; alternatively, in situations involving SAC reductions of less than ten percent, the state could reserve the right to require, or not to require, a Tier 2 antidegradation review after considering the physical, chemical and biological properties of the affected surface water, the circumstances surrounding the lowering of water quality, and the attendant risks to the environment and to human health.

In its' revision to the AIP, the MDNR chose the alternative in situations involving bioaccumulative SAC reductions of less than ten percent and revised the definition (in the Glossary of the AIP) for Significant Degradation and the language in Section II.A (bullets one and four in Section II.A of the AIP) as follows:

Glossary

Significant Degradation: A reduction by 10 percent or more of the facility assimilative capacity for any pollutant as a result of any single discharge, or the reduction of the segment assimilative capacity for any pollutant by 10 percent or more as a result of all discharges combined (See cumulative degradation) after existing water quality (EWQ) is determined, or any new or expanded discharge that **the department determines will likely result in the increased** ~~results, or potentially could result, in the~~ accumulation of pollutant**s** or their degradation products in sediment or fish tissue (see Section II.A.). Events or activities causing significant degradation are required to undergo a Tier 2 review.

Section II.A

- The proposed net increase in the discharge of a POC does not result in an increase in the ambient water quality concentration of the receiving water after mixing. When **the department determines** an increased pollutant load has thi~~s~~e potential ~~for such an accumulation of these pollutants~~ in determining the significance of degradation. **Such an assessment would consider the physical, chemical and biological properties of the affected surface water, the circumstances surrounding the lowering of water quality, and the cumulative risks to the environment and to human health;**

- The reduction of the facility assimilative capacity (FAC) for any pollutant ~~by~~ is less than 10 percent as a result of any single discharge and the reduction of the segment assimilative capacity (SAC) for any pollutant ~~by~~ is less than 10 percent as a result of all discharges combined after EWQ ~~was~~ is determined. **In situations involving bioaccumulative *[emphasis added]* pollutants and SAC reductions of less than ten percent, the applicant may be required by the department to proceed directly into defining the "necessity" of the discharge under Section II.B of this document unless it can be demonstrated [to the department] that there is no attendant risks to the environment and human health;**

The EPA requested clarification from the MDNR in two specific areas. First, how the Department determines which situations or instances will likely result in the increased accumulation of pollutant**s** or their degradation products in sediment or fish tissue. Second, additional clarification regarding an inconsistency in one of the examples[5] (example #6) which does not reflect the Tier 2 requirements regarding bioaccumulative pollutants. The EPA received the following clarifications from the MDNR on July 23, 2019[6]:

> "With this revision, the definition for "Significant Degradation" was revised to include "any new or expanded discharge that the department determines will likely result in the increased accumulation of pollutants or their degradation products in sediment or fish

[5] The EPA does not consider the examples in the AIP to constitute new or revised WQS for approval and is not acting on the examples for CWA purposes.
[6] Email from John Hoke to Ann Lavaty.

tissue (see Section II.A.)." The department determination of whether the discharge will likely result in the increased accumulation of pollutants in sediment or fish tissue would consider all existing and readily available physical, chemical, and biological data relevant to the pollutant of concern (POC). This would include any discharge and receiving stream water chemistry data, sediment quality and toxicity data, and fish tissue and other "organism" data (including mollusks and other shellfish). The scientific literature would also be considered and used to determine relevant and applicable toxicity, bioaccumulation, and probable effects concentrations or other endpoints protective of human health and the environment. The determination would be made for each bioaccumulative POC, as well as for any known synergies between multiple bioaccumulative POCs. Those POCs found likely to cause increased accumulation of pollutants or their degradation products in sediment or aquatic species would be considered "significant degradation". These facilities must then undergo a Tier 2 review as required by the AIP.

In the definition above, the AIP makes reference to bioaccumulation of POC in "fish tissue", rather than "aquatic species" or "organisms." This is due to the fact that the previous and current human health protection designated use definition (and criteria protective of the use) in rule are concerned with "fish consumption" as the route of exposure. Future updates of the rule to include human health protection endpoints protective of the consumption of "organisms", which would include fish, shellfish, and other aquatic species, will necessitate a revision of the language in rule and implementation documents such as the AIP. Although the text states determinations will look at "fish tissue," the department will consider all readily available and existing data for other organisms such as shellfish in making a bioaccumulation determination.

Also, when the department last reviewed and revised the AIP, the examples at the end of the document were not reviewed or updated in light of the changes to the document itself. Therefore, additional clarification is needed that the determination process would apply to all examples that have bioaccumulative POCs. In this respect, examples that identify and contain bioaccumulative POCs (e.g., Example 6 - Plant B on page 53) would also go through the significant degradation determination process for bioaccumulative pollutants. Future revisions of the AIP will include a note to this effect or include language indicating that the determination will take place."

These revisions address the EPA's previous disapproval and are now consistent with 40 CFR Parts 131.12(a)(1) and 131.12(a)(2) and are hereby approved.

D. 10 CSR 20-7.031(4) General Criteria

> **1.** 10 CSR 20-7.031(4)(D) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal, or aquatic life**. However, acute toxicity criteria may be ~~allowed~~ exceeded by permit in zones of initial dilution, and chronic toxicity criteria may be ~~allowed~~ exceeded by permit in mixing zones**;

40 CFR 131.13, General policies, states:

> States may, at their discretion, include in their State standards, policies generally affecting their application and implementation, such as mixing zones, low flows and variances. Such policies are subject to EPA review and approval.

Mixing zones do not constitute new state or tribal criteria or changes to the state- or tribe-adopted and EPA-approved criteria. Therefore, the narrative and/or numeric criteria for the water body are still the applicable criteria within the boundaries of the mixing zone. A mixing zone simply authorizes an applicable criterion to be exceeded within a defined area of the water body while still protecting the designated use of the water body as a whole. Mixing zones are areas where criteria may be exceeded rather than areas where criteria do not apply.

Based on comments made by the EPA during the public comment period, the Department revised its' proposal at 10 CSR 20-7.031(4)(D) to remove the allowance of acute toxicity in zones of initial dilution but clarify that excursions of "acute toxicity criteria" may be allowed by permit in these areas. The language is now consistent with definitions of "mixing zone" and "zones of initial dilution" at 10 CSR 20-7.031(1)(R) and (HH), respectively. Missouri's Water Quality Standards define "zone of passage" at 10 CSR 20-7.031(1)(II) and the mixing zone subsection, 10 CSR 20-7.031(5)(A)4.E, requires that zones of passage be provided.

Because of the revisions made to the proposed language at 10 CSR 20-7.031(4)(D), and the MDNR's response to the EPA's comments clarifying the provision is now consistent with the associated Missouri mixing zone regulations, the EPA here by approves this provision per 40 CFR 131.13.

> **2.** 10 CSR 20-7.031(4) (E): **Waters shall maintain a level of water quality at their confluences to downstream waters that provides for the attainment and maintenance of the water quality standards of those downstream waters, including waters of another state.**

The federal regulation at 40 CFR 131.10(b) requires that, when designating uses and associated criteria, states and authorized tribes consider "the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters." This new provision is consistent with 40 CFR 131.10(b) and is hereby approved.

E. 10 CSR 20-7.031(5) Specific Criteria

1. **10 CSR 20-7.031(5)(A)**: The maximum chronic toxicity criteria in Tables A and B shall apply to waters designated for the indicated uses given in the Missouri Use Designation Dataset and Tables G and H~~*[, except for waters designated for Ephemeral Aquatic Habitat or where less stringent criteria have been developed following a use attainability analysis]*~~.

This revision removes the exception to the applicability of chronic toxicity criteria in Tables A and B for the Ephemeral Aquatic Habitat (EAH) use designation. In its' November 17, 2015, WQS action, the EPA disapproved the language the MDNR has struck from this provision because the language on the EAH use and use attainability analysis failed to comport with 40 CFR Parts 131.6 and 131.11. Removal of this language satisfies the EPA's 2015 disapproval.

2. **10 CSR 20-7.031(5)4.B.III(a)**: Revised mixing zone provision increasing allowable mixing zones in larger streams (7Q10 > 20 cfs) from one-quarter to one-half the stream width, cross-sectional area, or volume of flow.

(III) Streams with 7Q10 low flow of greater than twenty cubic feet per second (20 cfs)—
(a) Mixing zone—one-quarter (1/4) of stream width, cross-sectional area, or volume of flow; length of one-quarter (1/4) mile**. If the discharger can document that rapid and complete mixing of the effluent occurs in the receiving stream, the mixing zone may be up to one-half (1/2) of the stream width, cross-sectional area, or volume of flow**;

As discussed above in Section D.1, States may, at their discretion, include in their WQS, policies generally affecting their application and implementation, such as mixing zones. Also discussed above in the same section is the notable fact that the MDNR has also ensured the regulations are consistent throughout the Missouri WQS as they regulate mixing zones. Missouri's Water Quality Standards define "zone of passage" at 10 CSR 20-7.031(1)(II) and the mixing zone subsection, 10 CSR 20-7.031(5)(A)4.E, requires that zones of passage be provided.

Therefore, this revision to the mixing zone policy should not impact the protection, or have any adverse impact, to designated uses for waters that are allowed mixing zones in NPDES permits if followed according to state law. As such, the EPA hereby approves the revisions to this mixing zone policy per 40 CFR 131.13.

3. **10 CSR 20-7.031(5)(L):** Sulfate and Chloride Limit for Protection of Aquatic Life. *[Water contaminants shall not cause sulfate or chloride criteria to exceed the levels described in Table A.]*

    1. **Streams with 7Q10 low flow of less than one (1) cubic foot per second. The concentration of chloride plus sulfate shall not exceed one thousand milligrams per liter (1,000 mg/L). Table A1 includes additional chloride criteria.**

    2. **Class P1, L1, L2 and L3 waters and streams with 7Q10 low flow of more than one (1) cubic foot per second. The total chloride plus sulfate concentration shall not exceed the estimated natural background concentration by more than twenty (20%) at the 60Q10 low flow.**

On January 6, 2015, the EPA disapproved Missouri's newly adopted criteria equations for chloride and sulfate and stated that the state's former chloride acute criterion of 860 mg/L and former chronic criterion of 230 mg/L remain in effect for Clean Water Act purposes, pursuant to the disapproval. Because Missouri did not have previous sulfate criteria, there is no criteria for that pollutant in Missouri's WQS effective for CWA purposes; the EPA has no CWA 304(a) criteria recommendation for sulfate.

Also, in the EPA's 2015 action on the chloride and sulfate criteria equation, the EPA stated:

> "As shown below, 10 CSR 20-7.031(4)(L) now references only the state's new sulfate criterion and newly revised chloride criteria:
>
> *(L) Sulfate and Chloride Limit for Protection of Aquatic Life. Water contaminants shall not cause sulfate or chloride criteria to exceed the levels described in Table A.*
>
> The position of two words in this provision ("criteria" and "levels") may have been inadvertently reversed at some point in the state's rulemaking process. Additionally, the revised rule fails to define the term "water contaminants." This term potentially could be interpreted to refer to chloride and sulfate derived from anthropogenic sources rather than all sources. Such an interpretation would not be protective of the aquatic life use, because toxicological risk is a function of ambient pollutant concentration rather than pollutant source."

The MDNR has reinstated the EPA's 304(a) recommendations for acute (860 ug/L) and chronic (230 ug/L) chloride criteria into Table A1-Criteria for Designated Uses and Health Advisory Levels, struck the language in 10 CSR 20-7.031(4)(L), per the EPA's comments, and reverted to the EPA's September 8, 2000, approved provision for chloride plus sulfate. As noted in the EPA's January 6, 2015, disapproval, the September 8, 2000 approval: " reflects a realization that the toxicological effects of chloride and sulfate may be additive (see Soucek 2007; Soucek et al. 2011). In the absence of an approved criterion for sulfate in Table A of the WQS, the earlier language affords the state's aquatic life some measure of protection against the potential additive effects of chloride and sulfate."

Because of these revisions, the EPA's disapproval has been fully addressed by the MDNR.

> **4. 10 CSR 20-7.031(5)(S)3**:
> (S) Site-Specific Criteria Development for the Protection of Fish, Shellfish, and Wildlife. When water quality criteria in this regulation are either underprotective or overprotective of water quality due to factors influencing bioavailability, or non-anthropogenic conditions for a given water body segment, a petitioner may request site-specific criteria. The petitioner must provide the department with sufficient documentation to show that the current criteria are not adequate and that the proposed site-specific criteria will protect all existing and/or potential uses of the water body.
> 3. Site-specific criteria shall protect all life stages of resident species and prevent acute and chronic toxicity in all parts of a water body~~*[unless early life stages are determined absent]*~~.

In its November 17, 2015, WQS action, the EPA disapproved the language the MDNR struck from this provision because the language was unclear and could be interpreted to mean that site-specific criteria are not required to be protective of resident species or preventative of acute and chronic toxicity where early life stages are determined absent. Any criterion developed pursuant to such an interpretation would not be protective of the aquatic habitat use and, therefore, would be inconsistent with 40 CFR Part 131.11. Removal of this language satisfies the EPA's 2015 disapproval.

F. 10 CSR 20-7.031(12) Water Quality Standards Variances.

A WQS variance is a time-limited use and corresponding criterion targeted to a specific pollutant, pollutant source and/or water body and reflecting the highest attainable water quality condition during a specified time period. Under section 303(c) of the CWA, the establishment of a WQS variance requires both a public participation process and the prior approval of the EPA. To obtain approval, a state must show that the designated use is unattainable during the specified time period owing to one or more of the factors listed at 40 CFR Part 131.l0(g). A variance provides a state additional time to implement adaptive management approaches for improving water quality while retaining the designated use as a long-term goal. States have adopted, and the EPA has approved, WQS variances applicable to individual dischargers, groups of dischargers, and entire water bodies or segments thereof.[7]

The MDNR revised its variance provisions to provide clarification of variance language, provisions for the EPA approval and when approval will not be granted, and removal of ambiguity regarding demonstration of non-feasibility.

[7] *Water Quality Standards Handbook: Second Edition* (EPA-823-B-94-006)

The EPA is approving the new bolded language in the following paragraph, and paragraphs A and C, below, because they are consistent with the EPA's variance regulations at 40 CFR 131.14 and 131.6.

10 CSR 20-7.031(12)

[(A)] A permittee or an applicant for a National Pollutant Discharge Elimination System (NPDES) or Missouri state operating permit*[,]* may pursue a temporary variance *[to a water quality standard]* pursuant to either section 644.061 or section 644.062, RSMo. *[In order to obtain U.S. Environmental Protection Agency approval for a water quality standards variance for purposes of the federal Clean Water Act, the following additional provisions apply:]* **A variance from water quality standards shall comply with 40 CFR 131.14.**

[In order to obtain U.S. Environmental Protection Agency approval for a water quality standards variance for purposes of the federal Clean Water Act, the following additional provisions apply: 1. A variance applies only to the applicant identified in such variance and only to the water quality standard specified in the variance. A variance does not modify an underlying water quality standard. 2. A variance shall not be granted if water quality standards will be attained by implementing technology-based effluent limits required under 10 CSR 20-7.015 of this rule and by implementing cost-effective and reasonable best management practices for non-point source control. 3. A variance shall not be granted for actions that will violate general criteria conditions prescribed by 10 CSR 20- 7.031(4). 4. A variance shall not be granted that would likely jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of such species' critical habitat. 5. A variance may be granted if the applicant demonstrates that achieving the water quality standard is not feasible as supported by an analysis based on the factors provided in 40 CFR 131.10(g), or other appropriate factors. 6. In granting a variance, conditions and time limitations shall be set by the department with the intent that progress be made toward attaining water quality standards.]

*[7.]***(A)** Each variance shall be granted only after public notification and opportunity for public comment. Once any variance to water quality standards is granted, the department shall submit the variance, with an Attorney General Certification that the Clean Water Commission adopted the variance in accordance with state law, to the U.S. Environmental Protection Agency for approval.

(C) Variance terms and conditions, including facility name, permit number, receiving stream name, first classified water body ID, discharge location, highest attainable condition, effective permit date, and the variance expiration date, will be incorporated into the Missouri Use Designation Dataset and Table J.

G. 10 CSR 20-7 Chronic Cadmium Criteria and New and Revised Tables

1. Chronic Cadmium Criteria.

The MDNR revised its chronic cadmium criteria equation to be consistent with the EPA's most recent 304(a) chronic cadmium update[8] published in 2016. The science supporting the EPA's 304(a) recommended criteria for chronic cadmium also supports the EPA's conclusion that Missouri's criteria will be protective of aquatic life. As such, Missouri's adoption of this criteria is consistent with 40 C.F.R. §§ 131.6(b), (c), and 131.11(a) and (b)(i), and the EPA hereby approves the revised criteria.

The EPA's chronic cadmium criteria, approved above, resulted in less stringent criteria, while the EPA's updated acute cadmium criteria, not adopted by Missouri, resulted in slightly more stringent criteria. The EPA expects the MDNR to adopt the updated acute cadmium criteria equation in its' next triennial review to provide both chronic and acute protections from cadmium to aquatic life in Missouri.

2. New and Revised Tables.

The following new and revised tables are hereby approved, as they serve only to rearrange the placement of Missouri's current numeric criteria, rearrange footnotes, and remove site-specific numeric criteria adoptions that are no longer in effect for CWA purposes.

a. Table A

Deletion of **Table A—Criteria for Designated Uses**, and New **Table A1** with new title "Criteria for Designated Uses and Health Advisory Levels."

b. New **Table A2** with new title "Criteria for Aquatic Life Protection."

The new Table is for equation dependent pollutants only.

c. Tables B1-3

Slight revision to ammonia acute and chronic criteria table; the footnotes were redistributed to exist under the applicable table rather than all under Table B3.

d. Table K, Site-Specific Criteria

In its previous form, Table K contained disapproved or expired site-specific criteria for dissolved oxygen. Site-specific criteria for East Fork Locust Creek and Little East Fork Locust Creek in Sullivan County were disapproved by the EPA on August 16, 2011. Site-specific criteria for Pike Creek and Main Ditch in Butler County were disapproved by the EPA on May 10, 2013. Site-specific dissolved oxygen criteria for Sni-a-Bar Creek in Jackson County expired October 31,

[8] https://www.epa.gov/sites/production/files/2016-03/documents/cadmium-final-report-2016.pdf

2014. The MDNR chose to maintain Table K in rule as a placeholder to provide a location for site-specific criteria that may be promulgated in the future.

II. List of Notable Non-Substantive Changes

Bolded language below represents new adoptions; italicized language represents deleted language. As they are non-substantive changes to Missouri's regulations they do not require Agency approval because they do not constitute new or revised WQS.

A. 10 CSR 20-7.031(1) Definitions.

1. (A) Acute toxicity—Conditions producing adverse effects or lethality on aquatic life following short-term exposure. The acute criteria in Tables A**1, A2,** and B**1** are maximum concentrations which protect against acutely toxic conditions. Acute toxicity is also indicated by exceedence of whole-effluent toxicity (WET) test conditions of paragraph (4)(I)2. For substances not listed in Table**s** A**1, A2,** *[or]* **and** B**1**, three-tenths (0.3) of the median lethal concentration, or the no observed acute effect concentration for representative species, may be used to determine absence of acute toxicity.

The modifications above allow for adoption of new/revised criteria Tables.

2. 10 CSR 20-7.031(1)(C)1.A. Warm Water Habitat (WWH)—Waters in which naturally occurring water quality and habitat conditions allow the maintenance of a wide variety of warm-water biota*[—]***.**

(I) *[Warm water habitat (]*Great River*[);]*
(II) *[Warm water habitat (]*Large River*[);]*
(III) *[Warm water habitat (]*Small River*[);]*
(IV) *[Warm water habitat (]*Creek*[);]*
(V) *[Warm water habitat (]*Headwater*[); and]*
(VI) *[Warm water habitat (]*Lake or reservoir*[).]*

3. Cool Water Habitat (CLH)—Waters in which naturally-occurring water quality and habitat conditions allow the maintenance of a wide variety of cool-water biota. These waters can support a sensitive, high-quality sport fishery (i.e., smallmouth bass and rock bass)*[—]***.**

(I) *[Cool water habitat (]*Large River*[);]*
(II) *[Cool water habitat (]*Small River*[);]*
(III) *[Cool water habitat (]*Creek*[);]*
(IV) *[Cool water habitat (]*Headwater*[); and]*
(V) *[Cool water habitat (]*Lake or reservoir*[).]*

4. Cold Water Habitat (CDH)—Waters in which naturally-occurring water quality and habitat conditions allow the maintenance of a wide variety of cold-water biota. These waters can support a naturally reproducing or stocked trout fishery and populations of other cold-water species*[—]***.**

(I) *[Cold water habitat (]*Large River*[);]*
(II) *[Cold water habitat (]*Small River*[);]*
(III) *[Cold water habitat (]*Creek*[);]*
(IV) *[Cold water habitat (]*Headwater*[); and]*
(V) *[Cold water habitat (]*Lake or reservoir*[).]*

The modifications above simply remove the redundancy of the terms warm water habitat, cool water habitat, and cold water habitat, as these terms already exist in the definitions.

5. 10 CSR 20-7.031(1)(E) Chronic toxicity—Conditions producing adverse effects on aquatic life or wildlife following long-term exposure but having no readily observable effect over a short time period. Chronic numeric criteria in Tables A**1, A2, B2,** and B**3** are maximum concentrations which protect against chronic toxicity; these values shall be considered four- (4-) day averages, with the exception of total ammonia as nitrogen which shall be considered a thirty- (30-) day average. Chronic toxicity is also indicated by exceedence of WET test conditions of subsection (5)(Q). For substances not listed in Table**s** A**1, A2, B2,** *[or]* **and** B**3**, commonly used endpoints such as the no-observed effect concentration or inhibition concentration of representative species may be used to demonstrate absence of toxicity.

The modifications above reference to the new/revised tables.

6. 10 CSR 20-7.031(1)(H): Moved "Existing uses" definition to 10 CSR 20-7.031(1)(L).

This change (and the addition of a new definition "(K) Eutrophication") caused shifts in numbering (lettering) of this section and are only editorial.

B. 10 CSR 20-7.031(4) General Criteria

*[(I)]***(J)** Waters in mixing zones, ephemeral aquatic habitat and waters of the state lacking designated uses shall be subject to the following requirements:

1. The acute toxicity criteria of Tables A**1, A2,** and B**1** and the requirements of subsection (5)(B); and

The modifications above reference to the new/revised tables.

C. 10 CSR 20-7.031(5) Specific Criteria

1. (A) The maximum chronic toxicity criteria in Tables A**1, A2, B2,** and B**3** shall apply to waters designated for the indicated uses given in the Missouri Use Designation Dataset and Tables G and H*[, except for waters designated for Ephemeral Aquatic Habitat or where less stringent criteria have been developed following a use attainability analysis]*. All Table A**1, A2, B2,** and B**3** criteria are chronic toxicity criteria, except those specifically identified as acute criteria. Water contaminants shall not cause or contribute to concentrations in excess of these values. Table A**1** values listed as health advisory levels shall be used in establishing discharge permit limits and management strategies until additional data becomes available to support alternative criteria, or other standards are established.

The modifications above reference to the new/revised tables.

2. 10 CSR 20-7.031(5)4.B.(IV)(a):
(a) Mixing zone—not to exceed one-quarter (1/4) of the lake width at the discharge point or one hundred feet (100') from the discharge point, whichever is less**; and**~~*[.]*~~
(b) Zone of initial dilution—not allowed.

This revision is editorial and has no effect on the substance of the regulation.

3. (B) Toxic Substances.

1. Water contaminants shall not cause the criteria in Tables A**1, A2, B1, B2,** and B**3** to be exceeded. Concentrations of these substances in bottom sediments or waters shall not harm benthic organisms and shall not accumulate through the food chain in harmful concentrations, nor shall state and federal maximum fish tissue levels for fish consumption be exceeded. More stringent criteria may be imposed if there is evidence of additive or synergistic effects.

The modifications above reference to the new/revised tables.

4. Site-specific alternative criteria for human health*[-fish consumption]* **protection** may be allowed. Designation of these site-specific criteria must follow procedures set forth in U.S. Environmental Protection Agency's *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health, October 2000* (EPA-822-B-00-004), as published by the Office of Science and Technology, Office of Water, U.S. Environmental Protection Agency, Washington, DC 20460, which is hereby incorporated by reference and does not include any later amendments or additions. The department shall maintain a copy of the referenced document and shall make it available to the public for inspection and copying at no more than the actual cost of reproduction.

The EPA's human health 304(a) criteria recommendations are designed to minimize the risk of adverse effects occurring to humans from chronic (i.e., lifetime) exposure to pollutants through the ingestion of drinking water and consumption of fish obtained from surface water. The removal of the phrase "fish consumption" clarifies that human health protection is not limited to just the consumption of fish, but also to the ingestion of drinking water and the consumption of fish obtained from a water body.

5. Metals criteria for which toxicity is hardness dependent are in equation format in Table A**2**.

The modification above provides reference to the new table A2.

6. (J) Dissolved Oxygen. Water contaminants shall not cause the dissolved oxygen to be lower than the levels described in Table A**1**.

The modification above provides reference to the newly named table A1.

7. (S)(8): The department shall determine if a site-specific criterion is adequate and justifiable.-The public notice shall include a description of the affected water body or water body segment and the reasons for applying the proposed criterion. If the department determines that there is significant public interest, a public hearing may be held in the geographical vicinity of the affected water body or water body segment. Any site-specific criterion promulgated under these provisions is subject to U.S. Environmental Protection Agency approval prior to becoming effective **for Clean Water Act purposes**.

This revision clarifies that site-specific criteria is not effective under the CWA until approved by the EPA. The EPA would clarify that Section 303(c) of the CWA and 40 CFR 131.20 require states and tribes to hold a public hearing in reviewing and revising WQS and to submit the results to the EPA.

8. 10 CSR 20-7.031(5)(A)4.B. The maximum size of mixing zones and zone**s** of initial dilution will be determined as follows **(the size may be refined by the use of mixing zone models, e.g. CORMIX, as appropriate):**

The revised mixing zone provision allows the use of mixing zone models. The EPA does not view this revision as a change to WQS requiring the EPA's approval. Rather, this revision is a permitting implementation provision.[9]

III. Items on which the EPA Continues to Review

A. 10 CSR 20-7.031(1)(~~*[DD]*~~**EE**) Waters of the state—**As defined in section 644.016 RSMo**~~*[All rivers, streams, lakes, and other bodies of surface and subsurface water lying within or forming a part of the boundaries of the state which are not entirely confined and located completely upon lands owned, leased, or otherwise controlled by a single person or by two (2) or more persons jointly or as tenants in common and includes waters of the United States lying within the state]*~~.

B. 10 CSR 20-7.031(5)(E): Water contaminants shall not cause **the four-day average pH concentration of representative samples**~~*[pH]*~~ to be outside of the range of 6.5 to 9.0 standard pH units **(chronic toxicity)**.

C. Table J: New 'place-holder' for "**Water Quality Standards Variances.**"

[9] National Pollutant Discharge Elimination System (NPDES) Permit Writers' Manual: Chapter 6

The Table contains the Fulton EPA approved variance and the Kirksville variance (the EPA has not acted on the Kirksville variance included in this WQS submission) noted with asterisks: *Effective upon issuance of the permit and EPA approval and **Includes CBOD and NBOD. The EPA is deferring action on this table until it acts on the Kirksville variance.

D. Table I. (New Table lettering/same old table.) **Biocriteria Reference Location**.

Table I provides reference water body locations for some aquatic habitat types. MDNR identified a copy error in the Missouri rulemaking process deleting half the table.

E. 10 CSR 20-7.031(12) Water Quality Standards Variances.

(B) Individual variances may be granted using the terms, conditions, and procedures found in the "Missouri Multiple Discharger Variance Framework from the Water Quality Standards of Total Ammonia Nitrogen, CWC-MDV-1-17," finalized by the department on September 15, 2017, which is incorporated by reference and does not include any later amendments or additions. The department shall maintain a copy of the referenced documents and shall make them available to the public for inspection and copying at no more than the actual cost of reproduction.

The EPA is continuing its review of paragraph B.