Washington University in St. Louis
SCHOOL OF LAW

Interdisciplinary Environmental Clinic

March 1, 2019

WQS Coordinator
Missouri Department of Natural Resources Water Protection Program
P.O. Box 176
Jefferson City, MO 65102-0176
Email: wqs@dnr.mo.gov

Re: Missouri's Triennial Review

Dear WQS Coordinator:

The Washington University Interdisciplinary Environmental Clinic (IEC) is providing this letter on behalf of the Missouri Coalition for the Environment (MCE), an independent environmental advocacy group. Founded in 1969, MCE has been actively advocating for Missouri to meet the CWA's fishable/swimmable standard since approximately the year 2000.

MCE requests that DNR consider several key issues in its triennial review process. Specifically, the MCE requests that the DNR protect for fishable/swimmable uses for all waters of the United States within Missouri, including wetlands, small streams, and headwaters, as well as waters already determined to be waters of the United States. MCE also requests that DNR develop nutrient criteria for lakes to protect drinking water and recreational uses, develop nutrient criteria for Missouri's classified streams and rivers to protect all uses, and update its ammonia standards to meet EPA's most recent recommendations.

The importance of these issues, particularly the classification of wetlands and updating the ammonia standards, was highlighted by the Triennial Review Survey Results that were distributed at the February 13, 2019 Water Quality Forum Meeting.[1] The survey asked respondents to categorize 11 environmental issues on a scale ranging from "Very Important" to "Unimportant." "Wetland Classification and Uses" received the second-most "Very Important" votes, while "Mussel Ammonia" received the fourth-most "Very Important" votes. We urge you to include these issues in the next Triennial Review.

A. MCE Requests That Missouri Comply With Federal Law and Add Additional Waters, Particularly Wetlands and Small Streams, to its List of Classified Waters

As you are aware, the Clean Water Act (CWA), passed in 1972, contains the explicit goal of making the nation's waters fishable and swimmable by 1983 and the elimination of "the

1 Triennial Review Survey Results, MDNR. Provided at the Water Quality Forum meeting on February 13, 2019.

discharge of pollutants into navigable waters."[2] Under the CWA, each state also retains the authority to promulgate its own water quality standards,[3] which, at a minimum, must meet those imposed by the CWA itself.[4]

The CWA defines as jurisdictional "waters of the United States," including tributaries, ponds, lakes, and wetlands.[5] Likewise, the River and Harbors Act ("RHA") regulations define "waters of the United States" to include "all waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide...includ[ing] wetlands...intrastate lakes, rivers, streams..."[6]

However, as MCE has reminded MDNR on many occasions, Missouri's classification system does not fully conform to the requirements of the CWA. In Missouri, bodies of water are characterized as either classified or unclassified. Classified waterbodies are protected for the fishable/swimmable uses by numeric water quality standards while unclassified waterbodies are not assigned uses and are protected only by narrative criteria. Unless a state can show that the fishable/swimmable level is unattainable, these waters of the U.S. must be protected by numeric criteria to guarantee that the fishable/swimmable uses are achieved. No such showing has been made for Missouri's unclassified waters.

While MCE acknowledges that MDNR's 2013 rule amendments classified an additional 90,000 miles of streams, there are still significant miles of unclassified streams and many acres of unclassified wetlands. Under the 2013 Amendment, rivers and streams that are not represented by flow lines on the United States Geological Survey ("USGS") 1:100,000 National Hydrography Dataset ("NHD") map, and lakes, ponds, and impoundments that do not intersect a flow line on the map, are not assigned default fishable/swimmable uses.[7] This standard leaves at least 63,245 miles of streams, 91,036 acres of lakes and reservoirs, and 988,325 acres of wetlands unprotected by the Clean Water Act.[8]

Moreover, studies and surveys have identified numerous streams, headwaters, and wetlands that are absent from this map.[9] In 2015, MCE submitted a petition asking MNDR to classify

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2 33 U.S.C. § 1251.
3 33 U.S.C. § 1313
4 *Id.*
5 40 C.F.R. § 230.3(o)
6 33 C.F.R. Part 328.3.
7 10 CSR 20-7.031(2); 10 CSR 20-7.031(1)(P).
8 *See* 10 CSR 20-7.031(1)(P). The 100K rule uses the Missouri Use Designation Dataset ("MUDD"), a digital geospatial dataset used in conjunction with GIS and maintained by MDNR. This dataset documents the names and locations of the state's rivers, streams, lakes and reservoirs that have been assigned designated uses. MCE has taken the 1:24,000 NHD map and compared it to the MUDD to determine the miles of water bodies that were represented on the NHD map but not on the MUDD.
9 Judy L. Meyer et al., *Where Rivers are Born: The Scientific Imperative for Defending Small Streams and Wetlands*, AMERICAN RIVERS AND SIERRA CLUB, at 7 (Feb. 2007), *available at* http://www.americanrivers.org/assets/pdfs/reports-and-publications/WhereRiversAreBorn1d811.pdf.

unclassified waters that the Army Corps of Engineers had already determined to be waters of the United States as part of jurisdictional determinations, as well as waters that are similarly situated in the same watershed as those jurisdictional waters. This petition described several waters that were currently unclassified but were required to be classified under the CWA. Those waters should be included as well.

Although the waters of the U.S. regulations are in a state of flux, as a matter of law in Missouri, states are required to protect wetlands as waters of the United States and classify them under the CWA when the wetland "possess[es] a significant nexus to waters that are or were navigable in fact or that could reasonably be so made."[10] Missouri's unclassified wetlands, streams, and lakes have a significant nexus to the health of the classified downstream waters. Further, despite any potential shifts at the federal regulatory level, the science supports inclusion of wetlands, small streams, and headwaters. The latest comprehensive technical review of peer-reviewed scientific literature, *Connectivity of Streams & Wetlands to Downstream Waters: a Review & Synthesis of the Scientific Evidence*,[11] was developed in 2015 by the U.S. EPA and U.S. Army Corps of Engineers. The report summarizes scientific understanding about the connectivity and mechanisms by which streams and wetlands affect the physical, chemical, and biological integrity of downstream waters, and reflects the current scientific understanding of the connectivity of streams to downstream waters.

Wetlands, which may be geographically located well outside of river or floodplain areas, can affect larger water systems.[12] The report found that wetlands are often hydrologically connected to streams, rivers, lakes, or other water bodies, and that spatial proximity is only one determinant of the magnitude of the effect that wetlands have on these bodies of waters. Wetlands can act as either sources or sinks for their connected waters. Wetlands can also modify the water quality of downstream waters, even without direct surface water connections.[13]

In addition, "[t]he scientific literature unequivocally demonstrates that streams, individually or cumulatively, exert a strong influence on the integrity of downstream waters, and that" *all* tributary streams, including perennial, intermittent, and ephemeral streams, are physically, chemically, and biologically connected to downstream rivers via channels and associated alluvial deposits where water and other materials are concentrated, mixed, transformed, and transported.[14] The composition of stream water has a substantial influence on water quality in rivers, and there are compelling links between the chemical composition of streams and the composition of downstream rivers, as sediments generally carry contaminants from streams to

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10 *United States v. Bailey*, 571 F.3d 791, 798 (8th Cir. 2009) (citing *Rapanos v. United States*, 547 U.S. 715, 779 (2006) (Kennedy, J., concurring)).

11 U.S. EPA. Connectivity of Streams and Wetlands to Downstream Waters: A Review and Synthesis of the Scientific Evidence (Final Report). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-14/475F, 2015. pg. ES-1.

12 *Id.*, pgs. ES-11-12; pgs. 4-21-30.

13 *Id.*, pgs. ES-11-12; pgs. 4-21-30.

14 *Id.*, pg ES-2. (emphasis added).

rivers.[15]

The CWA requires that the state review its water quality standards at least once every three years, a process which has come to be known as triennial review ("The State shall from time to time, but at least once every 3 years, hold public hearings for the purpose of reviewing applicable water quality standards…and, as appropriate, modifying and adopting standards.")[16] As the Triennial Review comes around once again, MCE asks MDNR to bring Missouri law into alignment with the CWA and assign uses to all waters of the U.S. within Missouri's borders. In particular, MCE asks MDNR to assign uses to Missouri's jurisdictional wetlands, to its small streams and headwaters, and to waterbodies which have already been determined to be waters of the U.S.

B. Missouri Should Review and Update its Water Quality Criteria for Nutrients

MCE believes that Missouri's newly-enacted lake nutrient criteria protecting the aquatic life use are insufficient and will not protect Missouri's waters from excess nutrient pollution for any other use. MCE requests that during this triennial review, MDNR will consider updating its current criteria in order to protect the condition of Missouri's water and the health of its residents. Specifically, MCE requests that DNR develop nutrient criteria for lakes to protect drinking water and recreational uses.

Nitrogen and phosphorus pollution, known collectively as nutrient pollution, pose serious environmental and human health problems in waters of the United States. MCE recognizes that creating nutrient criteria is challenging, as nitrogen and phosphorus are naturally present in aquatic ecosystems. However, protective criteria are essential for preventing significant environmental degradation. Protecting Missouri's water from excessive nutrient pollution is a priority to MCE due to the plethora of negative human health and environmental impacts nutrients pose.

1. MDNR Should Have Numeric Criteria for the Protection of Drinking Water Use

MCE believes that the nutrients standards recently approved by EPA do not protect the "most sensitive use" of a water body, as they are required to do. Although MDNR has insisted that its aquatic life standards will also protect the drinking water use, that assertion is not supported by any evidence. In its response to comments dated January 2018, MDNR claimed that the criteria for aquatic life were more protective than the criteria for drinking water, yet data for the Plains regions shows that the threshold criterion for protection of aquatic life was actually 5 µg/L higher than for drinking water supply.[17] Arguing that 25 µg/L is almost as good as 20 µg/L is not

15 *Id.*, pgs. 3-21-37
16 40 C.F.R. § 131.20

17 MDNR "Rationale for Missouri Lake Numeric Nutrient Criteria," December 2017, p.4

based in science and is unsupported by the record of MDNR's criteria development process.

Although MDNR has stated that further studies are necessary before drinking water standards can be derived, the facts suggest otherwise. Until early fall 2017, MDNR's proposed nutrients standards included numeric drinking water criteria. The 2017 "Rationale for Missouri Numeric Nutrient Criteria for Lakes" proposed a numeric drinking water criterion of 25 μg/L for all ecoregions.[18] EPA also developed numeric standards that would protect the drinking water use in its notice of proposed rulemaking dated December 15, 2017. There is no need for further studies, and development of numeric criteria to protect the drinking water use in Missouri's lakes should be part of the upcoming Triennial Review.

MCE's concern over the lack of drinking water criteria in the current rule stems from potential risks to human health. MDNR has previously acknowledged that many Missouri residents rely on drinking water from lakes and that nutrient loading can impact drinking water and, thus, human health.[19] Cyanobacteria blooms resulting from nutrient enrichment can pose a threat to human health by producing dangerous toxins that end up in drinking water.

MDNR chose to rely on the less protective value without evidence that it is actually protective of drinking water, thus endangering the health and safety of Missouri's residents.

2. Nutrient Standards For Lakes Should Include Numeric Criteria to Protect Recreational Uses

In addition to lacking numeric criteria sufficient to protect the drinking water use, the current rule lacks criteria for whole body contact recreation. MDNR has indicated that the information will continue to develop. Putting off the legal requirement to include the most sensitive use because creating numeric criteria is hard is irresponsible as science is always changing. And it is not as though the task is impossible based on the scientific evidence now available. When the current criteria were under development, EPA proposed an "alternative 1" which contained numeric criteria for recreation, proving that criteria development is possible.[20]

Establishing protective numeric criteria is essential for the future protection of Missouri's water, as current narrative standards do not translate into nutrient effluent limitations. Section 301(b)(1)(C) of the CWA requires permitting authorities to include effluent limits as needed to

18 MDNR, "Rationale for Missouri Numeric Nutrient Criteria for Lakes", 2017, pg 4.

19 MDNR "Draft Regulatory Impact Report (RIR) 10 CSR 20-7.031 Water Quality Standards," September 25, 2017, p.14

20 Water Quality Standards for the State of Missouri's Lakes and Reservoirs, 82 Fed. Reg. 61,213 Dec. 27, 2017.

meet water quality standards.[21] The permitting approach is clearly established in federal regulations as well as the EPA's NPDES Permit Writers' Manual. Permits are necessary to prevent degradation of existing water quality by limiting nitrogen and phosphorus discharges into the waterbody. MDNR's "Nutrient Criteria Implementation Plan" does not include any plan or indication or translating screening values to effluent limits.[22]

MCE requests that MDNR update the numeric criteria for the protection of aquatic life and develop numeric criteria for drinking water and recreation using EPA guidelines. EPA recommends a variety of approaches to developing numeric criteria such as the reference condition approach, empirical stressor-response models and mechanistic water quality models.

C. Missouri Should Develop Nutrient Criteria for Classified Rivers and Streams

MCE is further concerned with the lack of any nutrient criteria for streams and rivers. Currently the 115,732 miles of Missouri's classified flowing waters are without any numeric nutrient criteria at all. MDNR began the process of developing criteria in 2009, but "suspended" meetings in order to come up with "scientifically defendable and sufficiently protective" recommendations.[23] No such recommendations have been made, and Missouri is currently without criteria for streams.

MCE requests that MDNR develop nutrient criteria for Missouri's classified streams and rivers using one of the three suggested methods in EPA's "Nutrient Criteria Technical Guidance Manual: Rivers and Streams." The recommended methods include using previously published criteria, reference reaches or predictive relationships to develop nutrient criteria for rivers and streams.[24]

We recommend that MDNR look to Wisconsin as an example of sufficient and effective nutrient criteria. Wisconsin has numeric total phosphorus criteria for aquatic life, recreation and human health. Wisconsin's numeric criteria are translated to WPDES permits for points sources.

D. Missouri Must Update its Ammonia Criteria in Order to Reflect EPA's Most Recent Recommendations

Finally, MCE requests that MDNR updates Missouri's ammonia water quality criteria during this triennial review process.

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21 33 U.S.C. § 1311.

22 MDNR, "Nutrient Criteria Implementation Plan", July 2018.
23 MDNR, "Nutrient Criteria for Water Bodies", https://dnr.mo.gov/env/wpp/wqstandards/wq_nutrient-criteria.htm
24 Nutrient Criteria Technical Guidance Manual Rivers and Streams, U.S Environmental Protection Agency, July 2000, p. 94-100.

Ammonia is a form of nitrogen that exists in all discharges from domestic wastewater treatment systems as well as in aquatic environments and has the capability to cause direct toxic effects on aquatic life. The degree of ammonia toxicity depends on its chemical form as well as the water's pH and temperature. Un-ionized ammonia crosses fish gills and causes cellular damage. The state supports robust mussel and snail populations. Missouri's species include Unionid Mussels and Non-Pulmonate snails, which are considered sensitive species in regards to ammonia levels. Ammonia is known to leads to slower growth and lower reproduction in these species.[25] Its effect on the central nervous system of fish can cause convulsions and death.[26]

EPA published national recommended ambient water quality criteria in 2013 for the protection of aquatic life. The EPA guidelines reflect the latest scientific knowledge to be compliant with section 303(a) of the Clean Water Act. EPA prefers the use of site-specific criteria reflecting localized conditions but suggests the use of their proposed criteria when that information is not available.[27] The recommended water quality criteria are found in the table below.[28]

Criterion Duration	1999 Criteria	2009 Draft Updated Criteria	2013 Final Updated Criteria
Acute (1-hour average)	24	19	17
Chronic (30-day rolling average)	4.5*	0.91*	1.9*
*Not to exceed 2.5 times the criterion continuous concentration as a 4-day average within a 30-day period.			
Criteria frequency: Not to be exceeded more than once in three years on average.			

In 2014, MDNR responded to EPA's new recommended criteria acknowledging the state's specific sensitivity to ammonia. MDNR stated that the department had "initiated stakeholder discussions" but that there was "no firm target date for starting the rulemaking to adopt new standards."[29]

25 Lisa Foersom Huff, U.S EPA Office of Water, Ohio Water Environment Association Government Affairs Specialty Workshop, March 2014.
26 A Literature Review of Effects of Ammonia on Fish, The Nature Conservancy, Nov 2010.
27 Grubbs, Geoffrey. 2001. Development and Adoption of Nutrient Criteria into Water Quality Standards. WQSP–01–01. Policy memorandum signed on November 14, 2001, by Geoffrey Grubbs, Director, Office of Science and Technology, U.S. Environmental Protection Agency, Washington, DC.
28 Notice of Final Aquatic Life Ambient Water Quality Criteria for Ammonia- Freshwater, U.S Environmental Protection Agency, August 2013.
29 Ed Galbraith, Ammonia Criteria: New EPA Recommended Criteria, MDNR, Feb 2014.

It is time to set a target date. MDNR should update its standards to reflect EPA's most recent recommendations and scientific knowledge in order to comply with EPA guidelines.

Conclusion

In conclusion, MCE requests that the DNR protect all waters of the United States within Missouri, including wetlands, small streams and headwaters, as well as waters already determined to be waters of the United States, under the fishable/swimmable standard. The MCE also requests that the DNR develop nutrient criteria for lakes to protect drinking water and recreational uses, develop nutrient criteria for Missouri's classified streams and rivers to protect all uses, and update its ammonia standards to meet the EPA's most recent recommendations.

Sincerely,

Elizabeth J. Hubertz

cc: Maisah Khan