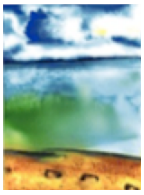

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November 22, 2017

SUBMITTED ELECTRONICALLY
Administrative Law Judge LauraSue Schlatter
Office of Administrative Hearings
P.O. Box 64620
600 N Robert St.
St. Paul, MN 55164

RE: **Proposed Rules Amending the Sulfate Water Quality Standard Applicable to Wild Rice and Identification of Wild Rice Waters, Minnesota Rules parts 7050.0130, 7050.0220, 7050.0224, 7050.0470, 7050.0471, 7053.0135, 7053.0205, and 7053.0406; Revisor's ID Number** 4324.
OAH Docket No. 80-9003-34519.

Dear Administrative Law Judge Schlatter,

These comments are submitted on behalf of WaterLegacy regarding the above-captioned Minnesota Pollution Control Agency (MPCA) proposed rules pertaining to the water quality standard applicable to wild rice. WaterLegacy is a Minnesota non-profit organization with approximately 10,000 members and supporters, formed to protect Minnesota water resources and the communities that depend on them.

WaterLegacy has been working to protect wild rice since 2010, when industry representatives first approached the MPCA and requested that the numeric limit on sulfate pollution be changed administratively, without rulemaking.[1] WaterLegacy intervened in 2011 when the Chamber of Commerce sued in state court on behalf of several mining companies to prevent implementation of Minnesota's wild rice sulfate limit. The standard was upheld on a motion for summary judgment in state district court,[2] and the Chamber's claims were dismissed by the Minnesota Court of Appeals.[3]

WaterLegacy served on the MPCA's Wild Rice Standards Study Advisory Committee from 2011 through 2017, and attended all meetings of the Peer Review Panel for the MPCA's proposed rulemaking, as well as those of the Advisory Committee and read every document released by the MPCA through the course of this rulemaking process as well as expert opinions and published literature. In addition, WaterLegacy has secured through the Data Practices Act and analyzed thousands of pages of MPCA internal documents pertaining to the wild rice sulfate standard and its implementation in permits since 1973.

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[1] WaterLegacy, Preserve Minnesota's Wild Rice Standard, Nov. 1 2010, Exhibit 1.
[2] *Minnesota Chamber of Commerce (MCC) v. Minn. Pollution Control Agency (MPCA)*, 2012 Minn. Dist. LEXIS 194 (Minn. Dist. Ct., Ramsey County, May 10, 2012), Exhibit 2.
[3] *Minnesota Chamber of Commerce (MCC) v. Minn. Pollution Control Agency (MPCA*), 2012 Minn. App. Unpub. LEXIS 1199 (Mn. Ct. App., Dec. 17, 2012), Exhibit 3.

Based on applicable law, the rulemaking record, internal MPCA documents, documentation of the history of implementation of Minnesota's existing rule, scientific research and expert opinions, WaterLegacy has reached the following conclusions, discussed in detail in these comments and its attached exhibits:

1) Under applicable legal standards, MPCA bears the burden to demonstrate that its proposed rule rescinding and revising the existing wild rice sulfate standard is needed, reasonable, and within the Agency's authority under the federal Clean Water Act. (p. 4)

2) MPCA's failure to enforce Minnesota's existing wild rice standard, and the history of industry opposition and legislative interference undermine MPCA's claims that its proposed rule revisions are intended or needed to provide "effective protection" of wild rice or "clarify" its implementation. (p. 7)

3) MPCA's proposal to rescind Minnesota's existing water quality standard limiting sulfate to 10 milligrams per liter (mg/L) in wild rice waters is neither needed nor reasonable and is inconsistent with protecting the designated use of waters for wild rice under the Clean Water Act. (p. 11)

4) MPCA's proposal to adopt an equation that would calculate sulfate limits for each water body based on the flawed assumption that sediment iron protects wild rice from the harmful effects of sulfate conversion to sulfide would neither provide effective protection of wild rice nor clarify implementation, is neither needed nor reasonable, and is inconsistent with the requirements of the federal Clean Water Act. (p. 18)

5) MPCA's proposal to restrict the water bodies in which any wild rice sulfate standard would apply to an arbitrary and exclusive list would remove a designated use protected under existing Minnesota rules and de-list wild rice waters identified by Minnesota state agencies, including waters downstream of existing and potential mining discharge. Such de-listing is neither needed nor reasonable and exceeds the MPCA's delegated statutory authority under the federal Clean Water Act. (p. 30)

6) MPCA's proposed rule stating criteria by which wild rice waters can be added in future rulemaking is unnecessary, arbitrary and provides no benefit to those seeking to protect wild rice from sulfate pollution. (p. 40)

7) MPCA's proposed implementation mechanisms for its sulfate equation are biased against protection of wild rice and inconsistent with any effective implementation of water quality standards. They are neither needed nor reasonable and exceed the MPCA's delegated statutory authority under the federal Clean Water Act. (p. 42)

8) MPCA's proposal to remove protection of thousands of wild rice waters from material impairment or degradation as a result of factors other than sulfate pollution - such as hydrologic alteration - is baseless and inconsistent with the rule's history, its stated purpose, and the Clean Water Act. (p. 50)

9) MPCA's failure to evaluate the impact of its proposed rules on eutrophication, aquatic life, methylmercury contamination of fish, and degradation of Treaty resources within

> tribal Ceded Territories, as compared to enforcement of Minnesota's existing rule, is unreasonable, arbitrary and inconsistent with the Clean Water Act. (p. 53)

On the basis of the discussion and authorities described below as well as the expert opinions and exhibits attached with our comments, WaterLegacy respectfully requests that the following sections of the MPCA's proposed rulemaking be rejected as unnecessary to further the MPCA's stated rule objectives, arbitrary, capricious and unreasonable, and outside the scope of the Agency's delegated authority under the Clean Water Act.

Proposed rule **Minn. R. 7050.0130, Subp. 2a** (lines 1.6 to 1.10) and **Minn. R. 7053.0135, Subp. 2a** (lines 66.11-66.12) defining method to allow annual averaging of flow and make sulfate standards less stringent due to an excessive calculation of dilution.

Proposed phrase in **Minn. R. 7050.0130, Subp. 6c** (line 2.3) stating "and are identified in part 7050.0471," which sets an arbitrary limit excluding "wild rice waters."

Proposed deletion of **Minn. R. 7050.0220, Subparts 3a (31)** (lines 3.15 to 3.16), **4a (31)** (lines 4.10 to 4.11), **5a (19**) (lines 5.7 to 5.8), **6a (14)** (lines 5.22 to 5.23) removing existing limit for sulfates of 10 mg/L where "wild rice present."

Proposed addition to **Minn. R. 7050.0220, Subparts 3a** (line 3.17), **4a** (line 4.12), **5a** (lines 4.23 to 4.24, 5.8), **6a** (line 5.24), applying the equation in proposed 7050.0224, subpart 5, to replace the sulfate limit.

Proposed phrase "4D when applicable to a wild rice water listed in part 7050.0471" arbitrarily limiting protection of water quality standards to certain wild rice waters in proposed rule text for **Minn. R. 7050.0220, Subp. 1 (B)(1)** (lines 2.19 to 2.20), **(B)(2)** (lines 2.22 to 2.23), **(B)(3)** (line 3.3), **(B)(4)** (line 3.5); Subp**. 3a** (lines 3.8 to 3.9); **Subp. 4a** (line 4.3); **Subp. 5a** (lines 4.20 to 4.21); **Subp. 6a** (line 5.14).

Proposed deletion of **Minn. R. 7050.0224, Subp. 1** (lines 6.8 to 6.14) and proposed rule at **Minn. R. 7050.0224, Subp. 6** (lines 9.13 to 9.18) arbitrarily excluding most wild rice waters so that they would not be protected from material impairment or degradation.

Proposed deletion of **Minn. R. 7050.0224, Subp. 2** (line 7.8 to 7.19) deleting fixed wild rice sulfate standard by removing the words "Sulfates (SO_4) 10 mg/L, applicable to water used for the production of wild rice."

Proposed rule **Minn. R. 7050.0224, Subp. 5** (lines 7.17 to 9.12) proposing use of an equation that would fail to protect wild rice, a rule for exceedance of standards that allows excessive pollution, implementation methods biased against the protection of wild rice, and error-prone sampling of parameters by dischargers.

Proposed rule **Minn. R. 7050.0471, Subp. 2** (lines 11.18 to 12.6) constraining theoretical future identification of wild rice waters.

Proposed rule **Minn. R. 7053.0205, Subp. 7, Item E** (lines 66.22 to 67.2) applying a flow rate that makes sulfate standards less stringent and cross-referencing the rule that allows extended exceedances.

Proposed rule **Minn. R. 7053.0406, Subp. 1** (lines 67.6 to 67.10) biasing implementation against application of a sulfate water quality standard.

DISCUSSION

1) Under applicable legal standards, MPCA bears the burden to demonstrate that its proposed rule rescinding and revising the existing wild rice sulfate standard is needed, reasonable, and within the Agency's authority under the federal Clean Water Act.

Minnesota statutes provide that a rule is invalid if it violates constitutional provisions, exceeds the statutory authority of the agency or was adopted without compliance with statutory rulemaking procedures. Minn. Stat. §§14.44; 14.45. An agency seeking to promulgate a rule must provide a statement of the "need for and reasonableness of" the rule. Minn. Stat. §§ 14.23; 14.131.

A rule that is arbitrary and capricious violates substantive due process, and "in determining if the agency acted arbitrarily and capriciously the court must make a 'searching and careful' inquiry of the record to ensure that the agency action has a rational basis." *Manufactured Housing Institute v. Pettersen*, 347 N.W. 2d 238, 244 (Minn. 1984); *Citizens to Preserve Overton Park v. Volpe*, 401 U.S. 402, 416, 91 S. Ct. 814 (1971). A rule is invalid when it is "not rationally related to the objective sought to be achieved" and will be stricken when the court concludes, after making a "careful and searching inquiry of the record" that a proposed rule "is arbitrary and not supported by substantial evidence in the record." *Builders Ass'n of the Twin Cities v. Minn. Dep't of Labor & Indus*., 872 N.W. 2d 263, 268, 269 (Minn. Ct. App. 2015).

When an agency seeks to rescind an existing standard, it must be taken into consideration that revocation "constitutes a reversal of the agency's former views as to the proper course" to implement policies committed to it. There is then, "at least a presumption that those policies will be carried out best if the settled rule is adhered to." *Motor Vehicle Mfrs. Assn. v. State Farm Mut. Automobile Ins. Co*., 463 U.S. 29, 41-42, 103 S. Ct. 2856 (1983). "Accordingly, an agency changing its course by rescinding a rule is obligated to supply a reasoned analysis for the change beyond that which may be required when an agency does not act in the first instance." *Id*., at 42.

The mere fact that there is "some rational basis within the knowledge and experience" of regulators will not suffice to validate agency rulemaking. *Bowen v. American Hospital A*ss'n, 476 U.S. 610, 627, 476 U.S. 610,106 S. Ct. 2101 (1986). "[D]eference cannot fill the lack of an evidentiary foundation on which the Final Rules must rest," and "An agency's action must be upheld, if at all, on the basis articulated by the agency itself." *Id.*, at 643, citing *Motor Vehicle Mfrs. Assn.* v. *State Farm Mut. Automobile Ins. Co*., 463 U.S., at 50. The history of the regulations may expose the "inappropriateness" of the deference requested by government and create an "irresistible" inference as to the mission with which the proposed rules were principally concerned. *Bowen v. American Hospital Ass'n* 476 U.S. at 645, 646-647.

The MPCA's statutory authority to replace Minnesota's wild rice sulfate standard is governed by the federal Clean Water Act and its implementing regulations as well as by state statute under a legislative structure often described as "cooperative federalism." The MPCA's authority to establish water quality standards and to classify the waters to which such standards apply,[4] must comply with the requirements of the Clean Water Act. 33 U.S.C. §1342(b). While states are given leeway to enact more stringent standards or procedures than required by the Act to protect and clean up their waters, state statutes and rules must, at a minimum, satisfy and conform to the Act and United States Environmental Protection Agency (EPA) regulations. 33 U.S.C. §1311(b)(1)(C).

Minnesota Rules contain multiple references to the structure of cooperative federalism, whereby state actions with respect to water quality must comply with federal requirements under the Clean Water Act. The permit program by which the MPCA authorizes pollution discharge pollution and the program by which the MPCA identifies waters that are impaired are subject to the Clean Water Act requirements. Minn. R. 7050.0255, Subp. 25, Subp. 39. Variances may only be effective if approved by the EPA in accordance with the Clean Water Act. Minn. R. 7050.0190, Subp. 4. Minnesota water quality standards as a whole are "in addition to any requirements imposed by the Clean Water Act and its implementing regulations," and "In the case of a conflict between the requirements of this chapter and the requirements of the Clean Water Act or its implementing regulations, the more stringent requirement controls." Minn. R. 7050.0210, Subp. 6c.

Recent case law confirms that a proposed amendment to alter a water quality standard pertaining to sulfate pollution must conform to Clean Water Act standards. In the case of *El Dorado Chem. Co. (El Dorado) v. U.S. EPA,* 763 F. 3d 950 (8th Cir. 2014), the El Dorado Chemical Company, facing the prospect of limits on sulfate and chloride discharge, filed a petition seeking to modify Arkansas water quality standards to increase maximum permissible discharge concentrations. The state revised its standards, and submitted them to the EPA, which rejected the revision.

The Eighth Circuit upheld the EPA's determination that the weaker standard was not appropriately protective of aquatic life. The Court described the "statutory reality":

> [S]tates do not have unfettered discretion under the CWA. States may establish and revise water quality standards, yet all new and revised water quality standards must be submitted to the EPA. 33 U.S.C. § 1313(c)(2)(A). The EPA has the power to reject a state's proposed water quality standard, and even promulgate its own standards in some circumstances. *Id*. § 1313(c)(3).

El Dorado v. U.S. EPA, *supra*, 763 F. 3d at 956.

EPA review of State water quality standards involves a determination under 40 C.F.R. §131.5(a):

(1) Whether the State has adopted water uses which are consistent with the requirements of the Clean Water Act;
(2) Whether the State has adopted criteria that protect the designated water uses;
(3) Whether the State has followed its legal procedures for revising or adopting standards;

[4] Minn. Stat. §115.03, Subd.1 (b), (c) and §115.44.

(4) Whether the State standards which do not include the uses specified in section 101(a)(2) of the Act are based upon appropriate technical and scientific data and analyses, and;
(5) Whether the State submission meets the requirements included in § 131.6 of this part.

State water quality rules must meet "minimum requirements" under Clean Water Act regulations, 40 C.F.R. §131.6, including the following:

(a) Use designations consistent with the provisions of sections 101(a)(2) and 303(c)(2) of the Act.
(b) Methods used and analyses conducted to support water quality standards revisions.
(c) Water quality criteria sufficient to protect the designated uses.

The State "bears the burden of adducing evidence that the proposed water quality criteria meet the requirements of the CWA." *El Dorado v. U.S. EPA*, *supra*, 763 F. 3d at 959. Designated uses must be "consistent with the requirements" of the Clean Water Act, and water quality criteria must "protect the designated water uses." *Id.* at 953.

Minnesota's wild rice standard limiting sulfates to 10 parts per million (mg/L) and designating the beneficial use to which that sulfate limit applies was adopted by the MPCA as part of formal rulemaking proceedings conducted in 1973. The rule was submitted to and approved by the EPA to comply with the requirements of the 1972 amendments to the Clean Water Act.[5] The MPCA's statutory authority to rescind or revise Minnesota's existing wild rice sulfate limit is constrained by the federal Clean Water Act and its implementing regulations, as well as by Minnesota Statutes.

As the Director of EPA's Region 5 Water Division wrote on behalf of the EPA Administrator in March 2015,

> Minnesota's existing sulfate criterion at 7050.0224, Subp. 2. is approved by the U.S. Environmental Protection Agency and is effective for all purposes under the Clean Water Act until such time as Minnesota adopts and EPA approves revisions. Any revisions to this water quality criterion must be submitted to EPA for review and approval pursuant to 33 U.S.C. § 1313(c)(2)(A) and CW A §303(c)(2)(A). . . If and when Minnesota submits water quality criteria changes to EPA, 40 CFR § 131.6 specifies the requirements for submittal which, at a minimum, include the methods and analyses conducted to support the standards revisions and a description of how the criteria are sufficient to protect the designated use. Federal regulations require that criteria be protective of a state's designated uses, and EPA's approval is based, among other things, on determining that there is scientifically defensible basis for finding that the criteria are sufficient to protect designated uses (see generally 40 CFR §§ 131.5, 131.11, and 131.21). Absent such a showing, EPA would be unable to approve a revised criterion.[6]

[5] *In the Matter of Proposed Amendments to the Regulation for the Establishment of Standards of Quality and Purity for Interstate Waters,* Hearing Testimony Excerpts, Exhibit 4, autop. 3-4.
[6] U.S. EPA (T. Hyde), Letter to P. Maccabee re possible changes to Minnesota's water quality criteria for sulfate to protect wild rice, Mar. 10, 2015, Exhibit 5.

2) MPCA's failure to enforce Minnesota's existing wild rice standard, and the history of industry opposition and legislative interference undermine MPCA's claims that its proposed rule revisions are intended or needed to provide "effective protection" of wild rice or "clarify" its implementation.

When an agency seeks to rescind or revise an existing standard, review of regulatory history can illuminate whether or not a proposed revision would, in fact, improve achievement of the initial policy. The history of a regulation may also shed light on whether the stated mission for revising a regulation is actually the main concern of the agency proposing its revision.

In its Statement of Need and Reasonableness (SONAR), the MPCA suggests that the proposed wild rice quality standard rules are needed to: "revise the existing standard to provide the most effective protection for the wild rice grain from sulfate-related impacts, and clarify implementation of the standard."[7]

However, the record of MPCA's failure to enforce the existing wild rice sulfate standard, the industry lobbying that has opposed *any* implementation of the standard – particularly one that is clear, and the political constraints on the MPCA's ability to enforce the wild rice sulfate standard irrespective of resource protection needs or even existing permits, belies the MPCA's justification for the proposed rule.

Minnesota's existing wild rice sulfate limit of 10 mg/L in waters used for the production of wild rice[8] was adopted based on the recommendation of the Minnesota Department of Natural Resources (DNR) and the finding that "sulfate concentrations above this level are a serious detriment to the growth of wild rice."[9] During the past 44 years since Minnesota's wild rice sulfate standard was adopted, the MPCA has only applied this standard once to limit sulfate pollution.

In 1971, *before* the 1973 wild rice rule was adopted, Minnesota Power's Clay Boswell coal plant had an average annual limit of 8 mg/L of sulfate, with a provision that if sulfate concentrations in May and June exceeded 10 mg/L, "the company shall suspend all discharge" from the pond providing the effluent.[10] In 1975, the MPCA sought to apply the recently-adopted 10 mg/L sulfate standard to discharge from the Clay Boswell coal plant.

Minnesota Power sought a variance, and a contested case was held resulting in a variance imposing a 40 mg/L sulfate limit from late April to mid-June and a 60 mg/L sulfate limit at other times.[11] However, just a few years later, someone at the MPCA negotiated with Minnesota Power to remove the wild rice sulfate concentration limit from its discharge permit without

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[7] MPCA, SONAR, p. 19.
[8] Minn. R. 7050.0224, Subp. 2.
[9] *In the Matter of Proposed Amendments to the Regulation for the Establishment of Standards of Quality and Purity for Interstate Waters*, Findings of Fact, Sept. 6, 1973, Exhibit 6, p. 11, ¶ 22
[10] MPCA, Permit for Construction and Operation of Disposal System, Minnesota Power and Light Co., Oct. 13, 1971, Exhibit 7, p. 3, ¶ 8.
[11] *In the Matter of the Applications for National Pollutant Discharge Elimination System Permits to Discharge from three Steam Electric Generating Plants of Minnesota Power and Light Co., Findings of Fact*, Conclusions and Recommendations, Oct. 28, 1975, Exhibit 8, p. 10, ¶36.

requiring a variance. Internal MPCA documents in 2001 reflect, "Basically, no one knows how this deal was struck without a variance."[12]

From the mid-1970s until 2010, the MPCA did not enforce the wild rice sulfate standard at all. In 2010, as part of the environmental review process for new and expanding mine projects, the EPA wrote letters to the MPCA advising that Minnesota must apply its 10 parts per million wild rice sulfate standard to protect wild rice in downstream waters. In connection with the Keetac taconite mine extension project, the EPA rejected the suggestion in the draft environmental impact statement (EIS) that the "current state rule establishes pollutant standards *to be used as a guide* for determining the suitability of waters for such uses, including the production of wild rice." The EPA wrote that "the current applicable Minnesota water quality standard for sulfate in these waterbodies is 10 mg/L."[13]

The EPA also wrote that the MPCA should apply Minnesota's wild rice sulfate standard to on-site and downstream waters potentially affected by the proposed PolyMet copper-nickel mine:

> The revised/supplemental DEIS should clarify the application of the Minnesota wild rice sulfate water quality standards in Minn. R.Ch. 7050.0220 and 7050.0224, given that the DEIS acknowledges the presence of isolated patches of wild rice in the Upper Partridge River, and describe whether sulfates from the project will impact the St. Louis River. We recommend the revised/supplemental DEIS include the 10 mg/L sulfate number within the tables of lists of applicable standards and predicted water quality (Page 4.1-141) and include a discussion of how it applies to on-site and downstream waters potentially affected.[14]

Since 2010, when the EPA advised Minnesota that its existing 10 mg/L wild rice sulfate limit must be enforced, the mining industry and other industrial dischargers represented by the Minnesota Chamber of Commerce have made a concerted effort to eliminate this water quality standard and prevent its application to control sulfate discharge.

On December 17, 2010, the Minnesota Chamber of Commerce submitted a letter and petition initiating this wild rice sulfate rule revision process in response to the fact that "the MPCA recently has stated its intent to take regulatory action" based on the wild rice sulfate rule, a situation the Chamber described as "untenable."[15] In its petition, the Chamber argued that the MPCA had no authority to regulate discharge to protect "waters where natural beds of wild rice exist" and that current scientific research "suggests sulfate limits of up to 3,000 mg/L are not harmful to wild rice."[16]

On December 18, 2010, on behalf of five named mining companies (Cliffs Natural Resources, United Taconite LLC, PolyMet Corp., Mesabi Mining LLC and United States Steel Corporation) the Minnesota Chamber of Commerce also filed suit in Minnesota state district court to

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[12] MPCA (D. White) Emails RE: rice, Feb. 15 - Mar. 30, 2001, p. 1, Exhibit 9.
[13] U.S. EPA (K. Westlake), Comments for the Draft Environmental Impact Statement (EIS) for the U.S. Steel Keetac Taconite Mine Expansion Project, Jan. 27, 2010, Excerpt, p. 7, autop. 5, Exhibit 10.
[14] U.S. EPA (K. Westlake), Comments for the Draft Environmental Impact Statement (EIS) for the NorthMet Project, Feb. 18, 2010, p. 15, autop. 9, Exhibit 11.
[15] MPCA Statement of Need and Reasonableness (SONAR), Ex. S-3b, p. 1.
[16] *Id.*, p. 2.

invalidate and block enforcement of the wild rice sulfate standard. The Minnesota district court upheld the wild rice sulfate standard on its merits and dismissed the Chamber's complaint in its entirety.[17] The Court of Appeals affirmed the dismissal of all counts of the Chamber's complaint, finding a lack of jurisdiction to consider its claims.[18]

In 2011, while the Chamber's lawsuit was pending, mining industry lobbyists requested legislative action to eliminate the wild rice sulfate standard or set a less stringent numeric limit on sulfate. In response to inquiry from legislative authors, the EPA sent a letter stating that a proposed revision to the wild rice sulfate limit would require submittal to EPA under Clean Water Act regulations. The EPA further explained, "Federal regulations require that criteria be protective of a state's designated uses and EPA's approval is based, among other factors, on determining that there is a scientifically defensible basis for finding that the criteria are sufficient to protect designated uses."[19]

The EPA further stated that proposed bills "which generally prevent MPCA from including sulfate limitations in permits until a new standard is developed" would have the effect of preventing the MPCA from applying effluent limits in NPDES permits based on federally approved water quality standards. The EPA explained EPA's authority to disapprove permits or even to withdraw the state's authority to administer the NPDES program in accordance with the requirements of the Clean Water Act.[20]

Legislation adopted in 2011 did not change or eliminate the wild rice sulfate standard outright; it established a study process to consider amending Minnesota rules pertaining to wild rice. The 2011 Session Law authorized monitoring or sulfate minimization in a schedule of compliance, but provided that, to the extent allowable under the Clean Water Act, the MPCA shall "ensure, to the fullest extent possible, that no permittee is required to expend funds for design and implementation of sulfate treatment technologies."[21]

In 2011, the MPCA issued two water pollution discharge permits for U.S. Steel permits with extended schedules of compliance. The Keetac mine expansion permit included a wild rice sulfate limit, but compliance at the mine was delayed for 7 years until August 17, 2018, and compliance at the tailing basin delayed by 8 years, until August 17, 2019.[22]

In 2015, removing the caveat that such avoidance must also be allowable under the Clean Water Act, the Minnesota Legislature passed a law telling the MPCA they could not issue, modify or renew water pollution discharge permits that "require permittees to expend money for design or implementation of sulfate treatment technologies of other forms of sulfate mitigation."[23] A 2016 session law went one step further, providing that the U.S. Steel final sulfate limits set in 2011

[17] *MCC v. MPCA*, (Minn. Dist. Ct.), *supra*, Exhibit 2.
[18] *MCC v. MPCA*, (Minn. Ct. App.), *supra*. Exhibit 3.
[19] U.S. EPA (T. Hyde), Letter to Sen. Bakk and Rep. Dill, May 13, 2011, pp. 1-2, Exhibit 12.
[20] *Id*., at 2.
[21] Laws of Minnesota, 2011 First Special Session, ch.2, article 4, section 32, SONAR Attachment 1.
[22] MPCA, Letter and Findings of Fact, Conclusions of Law and Order approving issuance of NPDES/SDS Permits MN0031879 and MN0055948 to U. S. Steel Corp. for Keetac mine facility in Keewatin, MN, Nov. 15, 2011, Exhibit 13, autop. 8, 9, 15, 17.
[23] Laws of Minnesota 2015, First Special Session ch. 4, article 4, section 136, SONAR Attachment 1.

resulting from the wild rice water quality standard "are no longer valid," the compliance schedule permit conditions related to those final limits "are no longer valid."[24]

Since the Keetac permits were issued in 2011, no permits issued by MPCA have included a limit on sulfates to protect wild rice.

Despite a Joint Priority Agreement with the EPA to eliminate the MPCA's backlog of NPDES[25] mining discharge permits, the MPCA has failed to update water pollution permits that have been out-of-date for decades; failed to set permit conditions requiring compliance with water quality standards, including Minnesota's wild rice sulfate limit; and failed to penalize permit violations. As a result, in July 2015, WaterLegacy filed a petition with the EPA for Withdrawal of Program Delegation from the State of Minnesota for NPDES Permits Related to Mining Facilities.[26]

In response to WaterLegacy's Petition for Minnesota NPDES Program Withdrawal, the EPA adopted a detailed Protocol for Responding to Issues Related to Permitting and Enforcement.[27] EPA also asked for a statement, in light of Minnesota wild rice sulfate standard Session Laws enacted in 2015 and 2016, "whether the current scope of MPCA's authority remains adequate to issue permits in compliance with all applicable CWA requirements, including whether MPCA continues to have adequate authority to implement all of its federally approved water quality standards consistent with CWA Section 301(b)(1)(C)."[28] EPA's investigation of WaterLegacy's Petition for Program Withdrawal is ongoing.

Internal MPCA documents reflect the Agency's understanding of its obligation under the Clean Water Act; "Minnesota is required to enforce the state assembled and federally approved water standards, including the wild rice sulfate standard."[29] The MPCA has also recognized, "The CWA requires us to designate beneficial uses. It does not require us to 'designate' or name all of the specific water bodies protected for that use," and that the standard could be applied case-by-case "using available site-specific information" about wild rice and sulfate.[30]

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[24] Laws of Minnesota 2016, Chapter 165, Section 1, Exhibit 14.
[25] National Pollution Discharge Elimination System (NPDES) permits control water pollution from point sources under Clean Water Act delegated authority.
[26] WaterLegacy Petition for Withdrawal of Program Delegation from the State of Minnesota for NPDES Permits Related to Mining Facilities (Petition for Withdrawal of Authority), Exhibit 15 and WaterLegacy Exhibits to Petition for Withdrawal of NPDES Authority, July 2, 2015, Exhibit 16. As of Nov. 21, 2017, materials related to this Petition are available on the EPA website at https://www.epa.gov/mn/npdes-petition-program-withdrawal-minnesota.
[27] U.S. EPA, Final Protocol for Responding to Issues Related to Permitting and Enforcement presented in the WaterLegacy Petition for Withdrawal of Program Delegation from the State of Minnesota for NPDES Permits Related to Mining Facilities, Mar. 8, 2016, Exhibit 17.
[28] U.S. EPA (T. Hyde), Letter to MPCA re MPCA Legal Authority to Implement its Authorized NPDES Program While Working Under Laws of Minnesota 2015, 1" Spec. Sess. Chapter 4, Article 4, Section 136, April 5, 2016, Exhibit 18. *See also* U.S. EPA (T. Hyde), Letter to MPCA re MPCA's Legal Authority to Implement its Authorized NPDES Program While Working Under Laws of Minnesota 2016, Chapter 165, Section 1, June 28, 2016, Exhibit 19.
[29] MPCA, MPCA Wild Rice Sulfate Standard (updated 1/28/13), Confidential Jan. 28, 2103, Exhibit 20A.
[30] Email MPCA (K. Kessler) re Talking points in response to wild rice standard questions, Feb. 3, 2013, Exhibit 20B; *see also* MPCA, Wild Rice Sulfate Standard and Impaired Waters Listing, Nov. 4, 2013, Exhibit 20C.

The sordid history of Minnesota's failure to implement the wild rice sulfate standard despite years of prodding by the EPA and the MPCA's clear recognition of its responsibilities reveals the political power dynamics behind this rulemaking. This history also contradicts the MPCA's assertions that the proposed rule is needed either for "effective protection" of wild rice from sulfate impacts or to "clarify" its implementation.

Since political interference has prevented effective enforcement of the existing rule, there is no evidence from which a fact-finder could determine that a change in the rule language, rather than a change in political pressure is needed in order to better protect wild rice. Industry opposition and legislative interference, not the text of a simple fixed water quality standard, have impeded "effective protection" of wild rice from sulfate and sulfide toxicity.

Second, there is no evidence that any lack of clarity in the existing rule has interfered with implementation of sulfate limits. In the Minnesota Power Clay Boswell permit action, an orderly hearing resulted in a variance and no judicial review was sought. In 2010, the EPA clearly explained to the MPCA how Minnesota's existing wild rice sulfate standard should be applied to protect downstream wild rice waters in permits for the Keetac mine expansion and the PolyMet proposed mine. U.S. Steel did not appeal the Keetac permits. A Minnesota district court found that Minnesota's existing wild rice sulfate rule was not void for vagueness[31] and the Court of Appeals held that scrutiny of the MPCA's implementation of the wild rice sulfate standard was premature and hypothetical unless and until the agency sought to enforce the rule and a company sought recourse through the administrative process.[32]

The regulatory history also illuminates the mission behind the petition for rulemaking. The Minnesota Chamber of Commerce, on behalf of itself and mining industry members, sought through litigation as well as through this rulemaking process to eliminate sulfate limits on natural stands of wild rice in order to avoid the costs of pollution control. Industrial dischargers have continued to advocate for removing the existing standard without replacing it or for weakening the standard by at least two orders of magnitude.[33] The politicians who hold the Agency's purse strings sought to delay and impede imposition of limits on sulfate discharge, particularly sulfate discharge from mining companies.

The next section of this discussion further illuminates the effects of political pressure on the development of this rulemaking process.

3) MPCA's proposal to rescind Minnesota's existing water quality standard limiting sulfate to 10 milligrams per liter (mg/L) in wild rice waters is neither needed nor reasonable and is inconsistent with protecting the designated use of waters for wild rice under the Clean Water Act. (p. 11)

As previously discussed, Minnesota's water quality standard limiting sulfate to 10 mg/L in water used for the production of wild rice was adopted in 1973 to protect the use of waters to support the growth of wild rice. Under Clean Water Act regulations, this standard may not be rescinded

[31] *MCC v. MPCA*, (Minn. Dist. Ct.), *supra*, Exhibit 2, slip op. 17.
[32] *MCC v. MPCA*, (Minn. Ct. App.), *supra*. Exhibit 3.
[33] Hearing testimony before Administrative Law Judge in St. Paul, Oct. 23, 2017.

unless the MPCA can meet its burden of proof to show that wild rice will be protected despite the removal of this standard.

The Clean Water Act supports a presumption in favor of retaining an existing water quality standard that has been duly enacted and approved by the EPA. EPA need not review a state's denial of a petition for rulemaking, *National Wildlife Fed'n v. Browner*, 127 F. 3d 1126 (D.C. Cir. 1997), but EPA has a non-discretionary duty to review a state's proposal to change a state's water quality standard, *El Dorado v. U.S. EPA, supra*, 763 F. 3d at 956.

Dr. David Schimpf, an emeritus associate professor of biology at the University of Minnesota appointed by the MPCA to serve as an external technical advisor, explained in his comments on the MPCA's draft rule proposal, "I believe that a new standard is not the default position, but that the existing standard is the default position."[34]

When the National Highway Traffic Safety Administration sought to rescind automobile safety standards requiring passive restraints, the Supreme Court found that the "first and most obvious reason for finding the rescission arbitrary and capricious" was that agency apparently gave no consideration to making the standard more effective. *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co*., *supra*, 463 U.S. at 46. For nearly a decade the industry had "waged the regulatory equivalent of war," but industry's decision to use a seatbelt technology that would not meet the standard's objectives "hardly constitutes cause to revoke the Standard itself." *Id.*, at 49.

MPCA's initial findings and recommendations proposed retaining Minnesota's 10 mg/L wild rice sulfate standard, and considering potential site-specific sulfate standards as needed. However, that strategy was abruptly abandoned in February 2014. Neither MPCA's SONAR nor its Technical Support Document (TSD) evaluate how wild rice could be most effectively protected by enforcing the existing wild rice standard and delimiting the rare cases where a site-specific standard would be needed and appropriate to protect wild rice.

During the years when hydroponic, mesocosm and field survey research was being done under MPCA auspices, WaterLegacy anticipated that the MPCA would preserve the existing standard if it was needed and reasonable to protect wild rice. We first realized that something had gone awry when the planned February 27, 2014 release of the MPCA's preliminary findings to the Wild Rice Standards Study Advisory Committee[35] and to the press[36] was abruptly cancelled.[37]

The first explanation for the aborted briefing was provided in a *Star Tribune* investigative news story more than a month later. That story asserted that the wild rice initiative was halted by a rebellion of Iron Range politicians who had taken their concerns to the Governor.[38]

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[34] D. Schimpf, Comments on MPCA draft proposed approach for Minnesota's sulfate standard to protect wild rice (March 24, 2015), submitted Dec. 14, 2015, p. 1, Exhibit 21.
[35] MPCA (P. Engelking) Email re MPCA release of preliminary recommendations and response to advisory e-mail, Feb. 25, 2014, Exhibit 22.
[36] MPCA (A. Foss) Email re DNT-Minnesota sulfate limit expected Thursday, Feb. 26, 2014, Exhibit 23
[37] MPCA (P. Engelking) Email re MPCA release of preliminary recommendations and response to advisory e-mail, Feb. 26, 2014, Exhibit 24.
[38] J. Marcotty, Iron Range rebellion halted wild rice initiative, *Star Tribune*, Apr. 6, 2014, Exhibit 25.

WaterLegacy secured MPCA internal documents through a Minnesota's Data Practices Act request; these documents revealed that politics had trumped science.

The Findings and Preliminary Recommendations drafted by MPCA's scientists in February 2014 had proposed preserving Minnesota's wild rice sulfate standard, stating, "The 10 mg/L sulfate standard is needed and reasonable to protect wild rice production from sulfate-driven sulfide toxicity."[39] These Findings and Recommendations are reprinted below:

Findings and Preliminary Recommendations Regarding the Wild Rice Sulfate Standard

Key Findings:

1. **Sulfate is not directly toxic to wild rice**. Both the MPCA Study and the research commissioned by the Minnesota Chamber of Commerce support this conclusion. However, sulfate in the surface water can be converted by bacteria to sulfide in the rooting zone of wild rice (see Figure 1).
2. **Sulfide is toxic to wild rice.** The MPCA Study demonstrated that elevated sulfide concentrations were toxic to wild rice seedlings. Hydroponic experiment data showed deleterious effects of sulfide on seedling plant growth when sulfide exceeded the range of 150 to 300 µg/L.
3. **Sulfide in the sediment is affected by the amount of sulfate in the water column, and the amount of iron in the sediment**. Data from a majority of the field sampling sites show that the range of 150 to 300 µg/L sulfide in the sediment relates to a water column concentration of sulfate between 4.3 and 16.2 mg/L. This range illustrates that conditions at some of the field sites are more effective than others at converting sulfate to sulfide, in part due to the availability of iron in the sediment (see Figure 1).

Preliminary Conclusions and Recommendations:

1. **The 10 mg/L sulfate standard is needed and reasonable to protect wild rice production from sulfate-driven sulfide toxicity.** The MPCA will also consider including a sediment sulfide concentration as a component of this water quality standard, in the range of 150 to 300 µg/L sulfide.
2. **The 10 mg/L wild rice sulfate standard should continue to apply to both lakes and streams**. Analysis of the field data does not support placing lakes and streams into separate subclasses. Iron availability, not water body type, appears to be a key controlling factor in the concentration of sulfide.
3. **Site-specific standards are expected for some waters**. Considerable data suggest that in some cases the development of a site-specific standard would be protective of wild rice production. This is most likely to occur in waters where the sediment iron is elevated and therefore a higher sulfate water column concentration may not result in a sulfide sediment concentration above 150 to 300 µg/L. There are also data to suggest that a site-specific standard lower than 10 mg/L may be needed for waters where sulfate is more efficiently converted to sulfide
4. **MPCA will continue to explore if the sulfate standard is needed to protect paddy-grown wild rice production.** The Study data do not suggest that paddy-grown wild rice is less susceptible to impacts from elevated sulfide. However, the land- and water-management

[39] MPCA, Wild Rice Sulfate Standard - Summary of Findings and Preliminary Recommendations Legislative Briefing Document, February, 2014, Exhibit 26.

activities associated with paddy wild rice production likely reduce the potential for sulfide production in the sediment

5. **MPCA does not currently have a recommendation regarding the "period of susceptibility" of wild rice to sulfate effects, but will continue to analyze data to further explore this question.** The sediment incubation experiment data show that sulfate can be converted to sulfide in both warm and cold conditions, and that sediment sulfide concentrations decrease once sulfate concentrations in the overlying water decrease. This is a complex interaction and more data analysis is needed before recommendations can be developed about this important question; any recommendation may also need to consider site-specific factors that affect this question

6. **Consideration should be given to changing the use class of the wild rice sulfate standard:** The MPCA is considering moving the wild rice sulfate standard from Class 4 where it currently resides to Class 2 and creating a new subclass to clarify that the wild rice sulfate standard is designed to protect the growth of wild rice grains for consumption by humans and wildlife. The MPCA is also considering revising the term "water used for production of wild rice." The MPCA has received comments asserting this wording is not the best descriptor for natural stands of wild rice that provide benefits to humans and wildlife.

MPCA internal emails reveal that MPCA presented these findings and recommendations to a group of Iron Range legislators prior to their planned release.[40] On February 26, the day before the Findings were set for release, the Governor's staff wrote, "This is a big deal and it is blowing up this morning." MPCA's Commissioner was directed to meet/talk with the Governor and with Iron Range Resources and Rehabilitation Board Commissioner Tony Sertich.[41] Commissioner Stine responded to the Governor's office, "Agree - the meeting with range legislators went poorly." He then spoke with MPCA staff.[42]

Later that evening, the MPCA communicated to legislators, the wild rice researchers, and the tribes that the MPCA "thought we would be ready to release preliminary findings on the wild rice sulfate standard on Thursday, but we are not."[43]

Internal memos confirm that the MPCA's media release "current up to when the plug got pulled" would have supported the 10 mg/L sulfate standard. The record suggests that but for the reaction of Iron Range politicians, the MPCA would have advised the public, "The existing sulfate water quality standard of 10 milligrams per liter is reasonable and should remain in effect . . . The existing sulfate standard should continue to apply to both lakes and streams."[44] Until February 26, 2017, when intense political pressure was brought to bear, the MPCA had concluded that preserving Minnesota's existing sulfate water quality was needed and reasonable to protect wild rice.

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[40] MPCA (K. Koudelka) Emails re MPCA Legislative Briefing on Wild Rice Sulfate Study, Feb. 21 and Feb. 25, 2014, Exhibit 27.
[41] MPCA (Commissioner Stine) and Governor's Staff (J. Tincher) Emails re Sulfate Standard, Feb. 26, 2014, Exhibit 28.
[42] *Id*.
[43] MPCA (K. Koudelka) Email re Postpone Legislative Briefing on Wild Rice Study, Feb. 26, 2014, Exhibit 29; MPCA (S. Lotthammer) Emails re Postpone release of preliminary findings on wild rice sulfate standard, Feb. 26, 2104, Exhibit 30.
[44] MPCA (R. Pribble) Email Wild rice preliminary finding, Mar. 3, 2014 and attached draft media release for Feb. 27, 2014, Exhibit 31.

Three additional government agencies have recently determined that a fixed sulfate limit of 10 mg/L is needed to protect wild rice. The Fond du Lac Band of Lake Superior Chippewa, a tribal government with authority under the Clean Water Act[45] to set water quality standards on the Band's reservation, has enacted a wild rice sulfate standard of 10 mg/L applicable to any lake or stream which supports wild rice growth.[46] The Grand Portage Band of Lake Superior Chippewa, a tribal government which also has authority under the Clean Water Act to set water quality standards on the Band's reservation, has enacted a 10 mg/L limit on sulfates in wild rice habitat.[47] The EPA reviewed and approved Fond du Lac's water quality standards in 2001,[48] and Grand Portage's water quality standards in 2005.[49] EPA approval of tribal water quality standards under the Clean Water Act is identical to approval of state water quality standards. Tribal water quality standards must designate uses of water consistent with the Clean Water Act, demonstrate the methods and analyses used to support water quality standards, and set water quality criteria sufficient to protect the designated uses of the waters.[50]

In addition, across Minnesota, every Chippewa/Ojibwe and Dakota tribal government - each of which represents a community committed to the effective protection of wild rice – has concluded that Minnesota's existing fixed sulfate limit of 10 mg/L should be maintained to protect wild rice. The six Bands of the Minnesota Chippewa Tribe in a March 2017 letter to Commissioner Stine and the eleven independent sovereign Ojibwe and Dakota nations of the Minnesota Indian Affairs Council in a May 2017 letter to the Commissioner, both recommended that the MPCA:

> Maintain the existing, simple-to-implement sulfate criterion that has been demonstrated to be protective of the water quality necessary to support wild rice, with rare exceptions afforded the option to demonstrate a site-specific standard that is protective of wild rice in that waterbody.[51]

MPCA's scientific Peer Review Panel did not have an opportunity to review whether Minnesota's Wild Rice Sulfate Standard Study[52] supported Minnesota's existing 10 mg/L wild rice sulfate standard. Although WaterLegacy requested that the charge questions to the Panel provide "sufficient latitude to provide independent analysis" without assuming the validity of the Agency's "iron mitigation" and sulfide prediction hypothesis,[53] the MPCA's charge to the Panel

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[45] Treatment as a state authority under the Clean Water Act is provided in 33 U.S.C. §1377(e).
[46] Fond du Lac Band of Lake Superior Chippewa Water Quality Standards, ord. #12/98 as amended 2001, Section 301 (m), contained in SONAR Ex. 46.
[47] Grand Portage Reservation Water Quality Standards, XI General Standards 10, adopted 2005 revised 2006, contained in SONAR Ex. 45.
[48] EPA, Water Quality Standards Regulations: Fond du Lac Band of the Minnesota Chippewa Tribe https://www.epa.gov/wqs-tech/water-quality-standards-regulations-fond-du-lac-band-minnesota-chippewa-tribe
[49] EPA, Water Quality Standards Regulations: Grand Portage Band of the Minnesota Chippewa Tribe https://www.epa.gov/wqs-tech/water-quality-standards-regulations-grand-portage-band-minnesota-chippewa-tribe
[50] 33 U.S.C. §§ 1251(a)(2), 1313(c)(2)(A); 40 C.F.R. 131.6 (a)-(c).
[51] Minnesota Chippewa Tribe letter to MPCA Commissioner Stine, Mar. 15, 2017. Exhibit 32; Minnesota Indian Affairs Council letter to MPCA Commissioner Stine, May 25, 2017, Exhibit 33.
[52] Studies funded by Minn. Laws 2011, 1 Sp. c.2, art. 4, § 32(a), SONAR Attachment 1.
[53] WaterLegacy, Comments and Proposed Charge Questions for Peer Review of the Wild Rice Sulfate Standard Studies, July 8, 2014, Exhibit 34.

focused on its hypothesis and excluded review of whether the studies supported the existing sulfate limit or some change to that standard.[54]

John Pastor is a Professor of Biology at the University of Minnesota Duluth, past Co-Chair of the Natural History Section of the Ecological Society of America, and an Honorary Member of the Faculty of Forest Sciences, Swedish University of Agricultural Sciences, Uppsala, Sweden. He received his Ph.D. in Forestry and Soil Science in 1980 from the University of Wisconsin-Madison and has authored two books on ecology, over 100 peer-reviewed papers, and over 20 book chapters.

For the past ten years, Dr. Pastor's research has focused on the ecology of wild rice, including the effects of sulfate pollution and iron on wild rice. This work has been funded by the National Science Foundation, MPCA, the Fond du Lac and Grand Portage Bands of Lake Superior Chippewa, and Minnesota Sea Grant. Dr. Pastor was the lead researcher for the hydroponic experiments and tank mesocosm studies of sulfate and wild rice coordinated by the MPCA in the Wild Rice Sulfate Standard Study funded by the Minnesota Legislature. His mesocosm studies of wild rice and sulfates began several years before the MPCA study and have continued through 2017.[55]

During the past six years, Dr. Pastor has read numerous MPCA draft proposals, internal memos, peer review materials, submitted and published articles and comments of various entities and experts. He has also reviewed the MPCA's Statement of Need and Reasonableness (SONAR) and Technical Support Document (TSD) in connection with this proposed rulemaking. Dr. Pastor has reviewed Minnesota's Wild Rice Sulfate Standard Study to evaluate whether the various components of this research support retaining the existing standard or adopting the equation proposed by the MPCA.[56]

Dr. Pastor's Technical Review Comments on the MPCA's proposed rule explain his mesocosm research where wild rice was grown in tanks under conditions similar to those in a natural environment. In these experiments, loading surface water with sulfate increased the level of sulfide production in sediments. Seedling emergence, seedling survival, vegetative growth and seed production all declined in proportion to the amount of sulfate added and the amount of sulfide produced. In each spring after the initial planting in 2011, the number of seedlings that emerged from the sediment declined significantly with increased sulfate concentrations ($p < 0.001$). The rate of seedling survival also declined significantly with increased sulfate concentrations ($p < 0.001$) and became worse in each subsequent year ($p < 0.001$). The rate of decline in seedling survival with amended sulfate was twice as high in 2014 and 2015 than in 2012 and 2013 (Pastor *et al*. 2017).[57]

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[54] MPCA Charge for Peer Review (June 2014), SONAR Ex. 7.
[55] John Pastor, Ph.D., Technical Review Comments on MPCA's Proposed Flexible Standard for Sulfate in Wild Rice Beds, Nov. 2017 (Pastor Technical Review 2017), p. 1, submitted herein with Attachments A through F.
[56] *Id*.
[57] *Id.*, p. 3 citing John Pastor *et al*., Effects of sulfate and sulfide on the life cycle of Zizania palustris in hydroponic and mesocosm experiments, Ecological Applications, 27(1), 2017, Attachment B to Pastor Technical Review 2017.

Elevated sulfate concentrations decreased vegetative growth, measured as plant biomass ($p < 0.001$), and the rate of decline increased significantly during the course of the experiment. Although the overall number of seeds produced per plant did not change across sulfate concentrations, the proportion of seeds produced that were filled and thus able to propagate declined significantly with increasing sulfate concentrations ($p < 0.001$). The proportion of filled seeds declined more steeply with each successive year ($p < 0.001$) (Pastor *et al.* 2017).[58]

These declines in seed production and seedling survival led to the extinction of wild rice populations after 5 years at sulfate concentrations comparable to drinking water standards (Pastor *et al*. 2017). Populations of wild rice exposed to sulfate concentrations of 150 mg/L have continued to decline over the course of the mesocosm experiments, nearing the point of extinction (Progress Report 2017).[59]

In Dr. Pastor's Technical Review, he explained that even though the MPCA field survey was designed to study sites with wild rice present despite high sulfate levels, 70% of wild rice was found in sulfate concentrations of 10 mg/L or less and 94% of the wild rice water bodies had sulfate concentrations of 50 mg/L or less.[60] Dr. Pastor cited John Moyle's research finding "No large stands of rice occur in water having sulfate content greater than 10 ppm [parts per million, or mg/L], and rice generally is absent from water with more than 50 ppm" (Moyle 1944)[61] and noted that the field survey findings corroborate Dr. Moyle's conclusions supporting a sulfate limit of 10 mg/L to protect wild rice. "Sulfate limits set for individual water bodies above the current standard of 10 mg/L incur increased risk to the sustainability of wild rice populations."[62]

Dr. Pastor concluded,

> The Wild Rice Sulfate Standard Study wild rice research funded by the Minnesota Legislature and coordinated by the MPCA has made important contributions to our understanding of the process of sulfide-induced toxicity resulting from sulfate concentrations in surface waters in the presence of iron and other factors. However, based on my training and experience, it is my opinion that the weight of the scientific evidence supports retaining Minnesota's existing sulfate standard of 10 mg/L to protect wild rice. As sulfate concentrations rise above the current standard, the risk to sustainable wild rice populations increases because of increased sulfide production.[63]

Although Dr. Moyle's initial findings were published in 1944, it should be noted that Dr. Moyle's field research through the mid-1970s confirmed his view that, in Minnesota, "There are no large stands in waters in which the concentration of the sulfate ion exceeds 10 parts per million."[64] In 1975, Dr. Moyle restated his opinion that the upper limit for self-perpetuating wild

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[58] *Id.*
[59] *Id., citing* John Pastor, Progress Report on Experiments on Effects of Sulfate and Sulfide on Wild Rice, June 28, 2017, Attachment E to Pastor Technical Review 2017.
[60] *Id*., p. 7
[61] *Id*., p. 2.
[62] *Id*., p. 7.
[63] *Id*., p. 8
[64] J. Moyle, Wild Rice – Some Notes, Comments and Problems, Minn. Department of Conservation, Spec. Pub. No. 47, Sept. 2, 1975, Exhibit 35.

rice stands in Minnesota is about 40 ppm, with most self-perpetuating stands below 10 ppm.[65] Dr. Moyle's writings suggest that his sampling data base included more than 1,500 field samples of hundreds of bodies of water.[66]

The MPCA cannot meet its burden of proof to demonstrate that rescinding Minnesota's existing wild rice sulfate standard is needed or reasonable to effectively protect wild rice. There is not only a presumption, but overwhelming evidence that the policy to protect the beneficial use of waters for wild rice reflected in the adoption and EPA approval of Minnesota's wild rice sulfate standard in 1973 would be carried out best by preserving and enforcing the existing rule limiting sulfate to 10 mg/L to protect wild rice.

Changes to MPCA Proposed Rule Sections

The following sections of the MPCA's proposed rule must be rejected as unnecessary, unreasonable and inconsistent with Clean Water Act requirements:

Proposed deletion of **Minn. R. 7050.0220, Subparts 3a (31)** (lines 3.15 to 3.16), **4a (31)** (lines 4.10 to 4.11), **5a (19**) (lines 5.7 to 5.8), **6a (14)** (lines 5.22 to 5.23) removing existing limit for sulfates of 10 mg/L where "wild rice present."

Proposed deletion of **Minn. R. 7050.0224, Subp. 2** (line 7.8 to 7.19) rescinding fixed wild rice sulfate standard by removing the words "Sulfates (SO_4) 10 mg/L, applicable to water used for the production of wild rice." WaterLegacy does not object to deletion of the phrase "during periods when the rice may be susceptible to damage by high sulfate levels" (lines 7.9 to 7.10) and would recommend replacing the term "water used for production of wild rice" (lines 7.8 to 7.9) with the phrase "wild rice waters," defined as recommended in section 5 of these comments.

4) MPCA's proposal to adopt an equation that would calculate sulfate limits for each water body based on the flawed assumption that sediment iron protects wild rice from the harmful effects of sulfate conversion to sulfide would neither provide effective protection of wild rice nor clarify implementation, is neither needed nor reasonable, and is inconsistent with the requirements of the federal Clean Water Act.

The MPCA has stated that its proposed sulfate equation should be tested according to whether it would provide effective protection of wild rice and clarify implementation.[67] Under applicable law, the rule must be measured against its stated purpose.[68] In addition, the Clean Water Act

[65] J. Moyle, Review of Relationship of Wild Rice to Sulfate Concentration of Waters, Mar. 16, 1975, Exhibit 36.
[66] *Id*. (reference to 283 lakes); *see also* J. Moyle, Relationships between the chemistry of Minnesota surface waters and wildlife management, *J. Wildlife Mgt*., Vol. 20, No. 3, July 1956 (reference to 1,546 water analyses), Exhibit 37.
[67] MPCA, SONAR, p. 19.
[68] *Bowen v. American Hospital A*ss'n, *supra*, 476 U.S. at 643, "For the principle of agency accountability recited earlier means that, 'an agency's action must be upheld, if at all, on the basis articulated by the agency itself," citing *Motor Vehicle Mfrs. Assn*. v. *State Farm Mut. Automobile Ins. Co*., *supra*, 463 U.S. at 50.

requires that new or revised water quality standards "protect the public health or welfare, enhance the quality of water and serve the purposes of this Act,"[69] and its implementing regulations require that water quality standards must protect the designated use and be based on appropriate technical and scientific data and analyses.[70]

The MPCA's proposed equation to identify sulfate limits water body by water body fails all of these tests. The MPCA's assumption that iron protects wild rice from the harmful effects of sulfate loading is premature and inconsistent with both laboratory experiments and field experience. The statistical analysis used to calculate what the MPCA has suggested would be "protective" levels of sulfate is flawed and raises at least as many questions as it answers. The MPCA's proposed equation and the sulfate levels deemed to be "protective" by the MPCA's formula haven't historically sustained wild rice and would not adequately protect wild rice. The effects of the MPCA's proposed equation allowing elevated sulfate where sediment iron is high are particularly troubling as applied to impacted waters downstream of mining discharge.

Within weeks after the "plug got pulled" on the MPCA's February 2014 Findings and Preliminary Recommendations, the MPCA floated a new "Preliminary Analysis" that proposed "sediment porewater sulfide can be predicted from sulfate and iron."[71] In June 2014, the MPCA took this proposal a step further, stating that the MPCA could protect wild rice from elevated sulfide using multiple quantile regression statistics to relate sulfate and iron to sulfide in porewater.[72] The MPCA's June 2014 Analysis of the Wild Rice Sulfate Study was submitted to the Peer Review Panel for scientific review.

The Peer Review Panel did not endorse using the MPCA's equation synthesis to predict sulfide levels or to protect wild rice from toxicity. The Peer Review Panel Summary Report[73] stated,

> Although the conceptual model described in the Synthesis is qualitatively correct, the current Synthesis goes too far in implying that sulfide concentrations in sediment can be predicted accurately by the multiple quantile regression model based on sulfate concentrations in the overlying water and acid-extractable iron in sediments. (*Summary Report*, p. 9)
>
> The conceptual model seems qualitatively correct, but it presents an overly optimistic impression about our ability to predict whether toxic sulfide levels will occur in a given wild rice stand from the sulfate concentrations in surface water and acid-extractable iron in sediment. (*Summary Report*, p. 33)

The Panel specifically expressed concern that the MPCA's proposal to create a regulatory standard was premature, since there had been no experiments to evaluate whether iron would mitigate the ecological effects on wild rice of elevated sulfates:

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[69] 33 U.S.C. §1313(c)(2)(A); 40 C.F.R. §131.3(b).
[70] 40 C.F.R. §§131.5, 131.6, 131.11. *See also* EPA, Water Quality Standards Handbook (1994 as updated), https://www.epa.gov/wqs-tech/water-quality-standards-handbook, Chapter 3, Water Quality Criteria (EPA 823 B 17 001 2017), pp. 1-2.
[71] MPCA, Wild Rice Sulfate Study Preliminary Analysis (March 2014), SONAR Ex. 5, p. 13.
[72] MPCA, Analysis of the Wild Rice Sulfate Standard Study: Draft for Scientific Peer Review (June 9, 2014), SONAR Ex. 6, pp. 45-47.
[73] The full report is provided in Eastern Research Group Summary Report of the Meeting to Peer Review MPCA's Draft Analysis of the Wild Rice Sulfate Standard Study, Sept. 25, 2014, SONAR Ex. 9. Excerpts from this report are provided in Exhibit 38 to these comments.

> It would be useful to have an experiment that examines whether iron would mitigate the ecological effects on wild rice of added sulfide levels. Additionally, current models do not account for the effects from oxygenated rhizospheres and iron plaques on root systems. MPCA needs to understand the mechanism of toxicity better before claiming to understand how iron mitigates sulfide stress. A reviewer responded that there is a substantial amount of literature about interactions between sulfate, sulfide, and iron. Another reviewer noted that these studies are on perennials, and wetland annuals have not been studied in any detail. For a regulatory standard it would be inappropriate to extrapolate from other species. (*Summary Report*, p. 28)

Gertie H.P. Arts, PhD, a senior ecologist with expertise in macrophyte (plants large enough to be seen by the unassisted eye) aquatic ecology and ecotoxicology,[74] served as a member of the scientific review panel. Dr. Arts emphasized in her post-meeting comments that the MPCA's hypotheses needed to be tested in an experimental setting, e.g. in mesocosms.

> As the analysis of the field data survey is based on correlations, those correlations can be used for hypothesis generation. Subsequently, causal relationships need to be tested experimentally. (Appendix F, *Reviewer Post-Meeting Comments* p. F-5)

> In general, I support the synthesis performed by MPCA. Appropriate study components have been chosen. However, as stated before, I suggest to use the field study for hypothesis generation. These hypotheses can be tested in an experimental setting, e.g., in mesocosms. (Appendix F, *Reviewer Post-Meeting Comments* p. F-9)

Dr. John Pastor, at the University of Minnesota in Duluth (UMD), began precisely this type of mesocosm experiment during the next growing system. He and a colleague, Nate Johnson, Ph.D., also supervised a student, Sophia LaFond-Hudson, who studied the effects of iron and sulfate amendment on the various stages of wild rice growth and development in 40 experimental buckets. As explained in Dr. Pastor's Technical Review and attachments, this experimental research performed at the University of Minnesota since 2015 has substantially undermined the MPCA's assumption that precipitation of sulfide in the presence of iron helps to protect wild rice.[75]

In the course of Dr. Pastor's initial mesocosm experiments, he noticed that wild rice roots in tanks with more than 50 mg/L sulfate had become blackened. In contrast, plants grown in the low sulfate treatments had orange stains on the roots throughout the annual life cycle. Using scanning electron microscope elemental scans, UMD research identified the black plaques as iron sulfide (FeS) plaques, whereas the oranges stains had iron but no sulfide and were probably iron (hydr)oxides. The orange healthy roots on the left are from wild rice grown under low

[74] Curriculum vitae of Gertie H.P. Arts attached as Exhibit 39 is available online at https://www.slideshare.net/GertieHPArts/cv-gertie-arts-november-2015.

[75] Pastor Technical Review 2017, *supra*, pp. 3-5. Additional discussion of the UMD iron and sulfide research is contained in Attachments as follows: J. Pastor, Iron and Sulfur Cycling in the Rhizosphere of Wild Rice (*Zizania palustris*), slide presentation to MPCA Wild Rice Standards Study Advisory Committee, Aug. 18, 2016 (Attach. C); J. Pastor, The Biogeochemical Habitat of Wild Rice, Sea Grant Research Annual Report, May 5, 2016 (Attach. D); J. Pastor, Progress Report on Effects of Sulfate and Sulfide on Wild Rice, June 28, 2017 (Attach. E); S. LaFond-Hudson, Iron and Sulfur Cycling in the Rhizosphere of Wild Rice (*Zizania palus*tris), May 2016 (Attach. F).

sulfate concentrations, at or near the current standard, and the black iron sulfide coatings on the right are on roots of plants grown with high sulfate concentrations.[76]

Dr. Pastor explains that the UMD research showed that seed nitrogen, seed count and seed weight were all markedly reduced in plants with high sulfate (300 mg/L) and black root surfaces, because the black iron sulfide precipitates inhibited the uptake of nutrients necessary for the filling and ripening of seeds necessary for propagation of wild rice. The amount of black iron sulfide on the roots of the plants and the effect on reduced seed production were proportionate to the concentration of sulfate in the experiments.[77]

Dr. Pastor's mesocosm experiments tripled the amount of sediment iron in the first growing season and removed litter to reduce carbon supply for microbes under high sulfate conditions. During the three years of this experiment, sulfate reduced seedling survival, plant growth, and seed production, regardless of iron amendment and litter removal. In mesocosms without added sulfate, neither litter removal nor added iron affected wild rice. When sulfate levels were increased, adding iron temporarily ameliorated the effects of increased sulfate on seedling survival compared with seedlings grown only with sulfate loading. However seedling survival in the tanks with both iron and sulfate additions was still less than in control tanks, particularly over time.[78]

In addition, precipitation of iron sulfide plaques on roots during the flowering and seed production period of wild rice's life cycle resulted in fewer and smaller seeds with reduced nitrogen content. The effect of sulfate additions in mesocosms, including those where iron was

[76] Pastor Technical Review 2017, *supra*, pp. 3-4.
[77] *Id*., p. 4. The iron and sulfate experiments are detailed in Attachments C (Pastor Slide Presentation 2016), D (Pastor Sea Grant Annual Report 2016), E (Pastor Progress Report 2017) and F (LaFond Hudson Thesis 2016) to the Pastor Technical Review.
[78] *Id*., pp. 4-5. *See also* Attachment E (Pastor Progress Report 2017).

added, was to drive the populations to extinction within 4 or 5 years in concentrations of 300 mg/L and to greatly reduce population viability at lower concentrations.[79]

Based on this experimental research, Dr. Pastor summarized, "Setting sulfate limits based on the level of porewater iron is premature and is not reasonable."[80] He explained,

> How and whether iron mitigates sulfide toxicity to wild rice is not fully understood and appears not to be related to the amount of reactive iron in sediments in the simple way assumed by MPCA's model. Therefore, setting sulfate standards based on the amount of reactive iron in sediments is premature at best. Based on current scientific evidence, an equation determining "protective" sulfate levels based on iron in sediments and available carbon is not a defensible strategy to protect wild rice.[81]

MPCA first learned of the UMD experimental research to test the iron mitigation hypothesis in the summer of 2016. MPCA's lead scientist for this rulemaking, Ed Swain, Ph.D., reviewed Sophia LaFond-Hudson's thesis on wild rice, iron and sulfur,[82] stating in June 2016, "Sophie's thesis (which read like a paper ready to submit) is very impressive."[83] In August 2016, Dr. Pastor presented his iron and sulfur research and the data from Ms. LaFond-Hudson's thesis to MPCA staff and the Wild Rice Standards Study Advisory Committee.[84] None of this UMD research on iron mitigation or detriment is discussed in either the MPCA's SONAR or Technical Support Document (TSD) for the MPCA's proposed rulemaking.

The Peer Review Panel also raised questions about the chemistry behind the MPCA's equation-based flexible standard. The chair of the Panel, Patrick L. Brezonik, Ph.D., a chemist with expertise in the kinetics of chemical processes in aquatic systems,[85] suggested the MPCA had gone too far in asserting that the multiple quantile regression analysis model could accurately predict concentrations of sulfide in sediment porewaters. Dr. Brezonik noted that if sulfate reduction (change to sulfide) occurred, ferric oxy-hydroxides (iron compounds) presumably would be depleted.[86] He suggested that the complexity of chemistry made the MPCA's proposal to predict a maximum sulfide concentration from surface water sulfate and iron content unrealistic; "If for no other reason than the uncertainties in the kinetics of solid-phase FeS formation, the statement at the beginning of the paragraph is not realistic."[87]

Dr. Pastor's Technical Review also questions the MPCA's assumption that concentrations of

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[79] *Id*. Iron was also present in groundwater in the well used to replenish mesocosm water levels. *See* Attachment B (Pastor *et al*., Ecol. App. Paper 2017, p. 325).
[80] *Id*., p. 2.
[81] *Id*., p. 5.
[82] LaFond-Hudson Thesis 2016 is Attachment F to Pastor Technical Review 2017.
[83] MPCA (E. Swain), N. Johnson, J. Pastor and P. Maccabee Emails re Wild Rice Sulfate, Sulfide and Iron Research, June 13 to June 30, 2016, autop. 2, Exhibit 40. Email also indicate MPCA also received Dr. Pastor's 2016 Sea Grant Report, Attachment D to Pastor Technical Review 2017, in June of 2016.
[84] Pastor Slide Presentation 2016, Attach. C to Pastor Technical Review.
[85] Curriculum vitae of Dr. Patrick L. Brezonik attached in Exhibit 41is available online at https://www.waterboards.ca.gov/lahontan/water_issues/programs/tmdl/lake_tahoe/docs/peer_review/brezonik_cv.pdf.
[86] Excerpts from Peer Review Summary Report, *supra* Exhibit 38, autop. 5.
[87] *Id.* Dr. Brezonik referred to the paragraph in MPCA, Draft for Scientific Peer Review (June 9, 2014), SONAR Ex. 6, lines 1258-1260 at p. 52.

sulfide, sulfate, reactive iron, and organic matter will remain in a steady state over long periods of time. He explains that once sulfate from discharge is added to wild rice bed from wastewater discharge, an ecosystem would no longer be in a steady state. Microbes in the sediments will convert some of the sulfate to sulfide, which will then precipitate with some of the reactive iron, and the iron bound up in the precipitate will no longer be available to precipitate any additional sulfide.[88]

Dr. Pastor cautioned, "In an ecosystem, it cannot be assumed that natural inputs of reactive iron from streams and groundwater or from weathering of sediments will keep pace with sulfate pollution."[89] This principle of chemistry would be salient for the protection of wild rice. "If the ecosystems are not in steady state, then the calculation that a certain sulfate concentration in surface water creates lower-than-toxic levels of sulfide during one year may not apply to subsequent years. A sulfate concentration deemed "protective" in year one could become toxic in subsequent years."[90] Dr. Pastor concluded that the MPCA's proposed equation based standard is based on assumptions that cannot be scientifically supported,

> MPCA's proposed flexible standard equation makes important assumptions about the ameliorative effects of iron and the continuation of a steady state over time despite sulfate addition to the ecosystems. These assumptions cannot be defended based on scientific evidence.[91]

Since the MPCA first proposed an equation-based water quality standard for sulfate, the Agency has proposed three different statistical models from which individual waterbody sulfate standards would be calculated. In 2014, the MPCA proposed a multiple quantile logistic regression model for the Peer Review Panel.[92] In 2015, the MPCA proposed a structural equation model (SEM) in its draft rule proposal.[93] Now, in 2016, the MPCA has proposed a multiple binary logistic regression (MBLR) model.[94]

The MPCA's SEM approach was a deterministic model allowing direct calculation of the expected sulfide level and comparison of that expected sulfide level with the actual observed level of sulfide in field survey sediments. John William Shipley, Professor in the University of Sherbrooke Department of Biology and the author of two scientific textbooks and 16 peer-reviewed publications regarding the development and ecological application of structural equations modeling, reviewed the MPCA's proposed SEM model. In addition to criticizing technical aspects of the SEM approach, Dr. Shipley concluded that the MPCA's model had "quite poor 'within-sample' predictive ability and could not reliably distinguish between lakes whose porewater sulfide concentration is below or above the critical value."[95]

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[88] Pastor Technical Review 2017, *supra*, pp. 5-6.
[89] *Id*., p. 6.
[90] *Id*., p. 5.
[91] *Id*., p. 8.
[92] MPCA Analysis of the Wild Rice Sulfate Standard Study: Draft for Scientific Peer Review (June 9, 2014), SONAR Ex. 6.
[93] MPCA Proposed Approach for Minnesota's Sulfate Standard to Protect Wild Rice (Draft Proposal) (March 24, 2015), SONAR Ex. 10.
[94] MPCA Technical Support Document (TSD), SONAR Exhibit 1.
[95] Bill Shipley, Evaluation of the structural equations model described in the document entitled "March 2015 proposed approach for Minnesota's sulfate standard to protect wild rice" by the Minnesota Pollution Control Agency, dated March 24, 2015, prepared Nov. 4, 2015, pp. 4-5, Exhibit 42.

Dr. Joel Roberts, Mathematics Professor emeritus at the University of Minnesota, compared the 2015 SEM equation's expected sulfide results with the observed field survey results and concluded that the MPCA proposal appeared to be "an unreliable method to protect wild rice from excess sulfide.[96] Dr. Roberts was particularly concerned that the equation might significantly underpredict sulfide in high-sulfide waters, such as Sandy Lake in St. Louis County, where sulfide levels as high as 3,080 µg/L had been measured, despite the presence of high levels of iron in the sediments.[97]

MPCA's 2016 new MBLR equation calculates a "protective" sulfate concentration based on the probability that sulfide levels will be below a certain threshold (120 µg/L), rather than by calculating an expected sulfide level. More than half of the "protective" sulfate concentrations calculated with this formula for field survey sites are above the existing standard of 10 mg/L and many far exceed this standard.[98]

Internal MPCA documents raise questions about the development of MPCA's new equation. The MPCA based its formula on the "Class B" data set, which excludes multiple samples, although sulfate was higher when multiple samples were included,[99] and 70% of the variability in sulfide variables was due to differences in the repeated measures within the sites.[100] The MPCA stated that the "general consensus" based on analysis of the experimental and field data was that the EC10 (10% effect concentration) for wild rice presence was between 50 and 100 µg/L.[101] However, the MPCA seems to have selected an EC10 sulfide threshold of 120 µg/L based on statistical error rates in predicting sulfide.[102]

The Technical Support Document (TSD) acknowledges that the "most defensible" EC10 based on the field research is 58 µg/L for all sites or 93 µg/L for sites with sufficient transparency to support wild rice.[103] MPCA's method of selecting an EC10 of 120 µg/L appears to combine a statistical approach and visual identification of the point where the proportion of sites with any wild rice present appears to decline.[104] In addition, the MPCA's probability equation was derived to equalize the risk that it would be over-protective (reducing sulfate more than necessary) and under-protective (reducing sulfate less than needed to protect wild rice).[105]

Dr. Joel Roberts reviewed the MPCA's 2016 multiple binary linear regression (MBLR) formula to evaluate whether it resolved concerns with the MPCA's 2015 SEM model and to

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[96] Joel Roberts, Memorandum Regarding Wild Rice Sulfate Standard Calculations Comparing Expected and Observed Sulfide Levels in Field Study Data and Interpreting Statistical Analysis, December 16, 2015, p. 1, Exhibit 43.
[97] *Id*., pp.
[98] MPCA Field Survey Data with calculated protective sulfate level (sorted by CPSC), Exhibit 44.
[99] MPCA (M. Shore), Which data set should we use? Feb. 9, 2016, p. 5, Exhibit 45.
[100] MPCA (M. Shore), Which data set should we use? Updated, Feb. 12, 2016, p. 5, Exhibit 46.
[101] MPCA (M. Shore), Developing a logistic regression model for the sulfate standard, Mar 10, 2016, p. 2 Exhibit 47.
[102] MPCA (M. Shore), Looking at the CPSC for different sulfide values Updated, Mar. 29, 2016, Exhibit 48.
[103] MPCA, TSD, p. 36.
[104] *Id*., pp. 36-39.
[105] *Id.*, p. 46.

see if it raised new questions.[106] Dr. Roberts noted that the type of impartial direct comparison with actual field data that he had performed in 2015 to determine the quantitative goodness of fit was not possible with the new equation, since it predicted a probability rather than an actual sulfide level.[107]

He found that some limited comparisons could be made using the tools provided in the TSD. First, Dr. Roberts verified the calculated protective sulfate concentration (CPSC) obtained by the MPCA for each sampling event in the field survey. He then compared the CPSC with the actual surface water sulfate level at each site. Reviewing data for all field survey sampling other than rice paddies, for 170 of the 238 (71%) sampling events, the CPSC calculated was higher than the existing sulfate level.[108]

Dr. Roberts pointed out that, in addition to the added cost, implementation of an equation-based standard also involves the possibility of sampling error, a concern that had not been resolved by the new formula. Dr. Roberts cited the degree of uncertainty reflected in the MPCA's 2015 proposal and reviewed comparable calculated protective sulfate concentrations for the same water bodies using the 2016 equation. He found a wide divergence in prediction of a protective sulfate level, particularly in sites where the CPSC is higher than the current 10 mg/L standard.[109]

At Second Creek, based on sampling dates within the same year, CPSC ranged from 166.92 mg/L to 657.30, nearly four times higher. At Mississippi Pool 5, again within the same sampling year, the CPSC ranged from 132.16 mg/L to 1160.97, a level 8.78 times higher. For Lake Monongalia, where various locations within the water body were sampled, calculate CPSC ranges from a low of 3.66 mg/L to 455.39, more than two orders of magnitude of variation.[110]

Dr. Roberts examined the equation structure with an iron exponent approaching two, and expressed the concern that, like the prior 2015 formula, this function would be likely to lead to inflated estimates for sulfate concentrations at the upper end of the range.[111]

Dr. Roberts noted that he had compared CPSC values for field survey sites using the MPCA's 2015 formula with its EC20 sulfide threshold of 165 µg/L and the 2016 formula with its EC10 sulfide threshold of 120 µg/L. Somewhat surprisingly given the change from EC20 to EC10, spreadsheet calculation showed a seemingly random pattern of changes.[112] When both the 2015 SEM formula and the MPCA's new MBLR equation were used to calculate a protective sulfate concentration for the same EC10 120 µg/L sulfide threshold, *in every case the new formula resulted in a less protective sulfate standard than the 2015 formula*. In almost 80% of the cases, the 2015 SEM equation would have resulted in sulfate standards less than half of those

[106] Joel Roberts, Ph.D., Memorandum Regarding Proposed Wild Rice Rule Change, November 22, 2017, submitted herein with Attachments 1 through 4 (Roberts Memorandum 2017).
[107] *Id*., pp. 1-2.
[108] *Id*., p. 2, comparison data provided in Attach. 2 to Roberts Memorandum 2017.
[109] *Id*., pp. 3-4.
[110] *Id*., pp. 3-4, pertinent data provided in Attach. 3 to Roberts Memorandum 2017.
[111] *Id*., pp. 4-5.
[112] *Id*., p. 5.

currently proposed by MPCA.[113]

Dr. Roberts questioned why the 2016 MBLR did not lead to more protective calculated sulfate levels even as the sulfide threshold became more stringent. He reviewed the change from a deterministic to a probabilistic formula. He then questioned the structure of MPCA's 2016 formula, which predicts a 50% chance that wild rice will be protected at the EC10 level. Dr. Roberts suggested that a 50/50 chance of meeting the EC10 "seems inadequate for protecting wild rice."[114]

Dr. Roberts concluded that the MPCA's proposed MBLR equation "is inadequate for explaining the data from the Wild Rice Field Study. It does not resolve all of the concerns raised by the 2015 SEM equation. And it is inadequate for protecting Minnesota's Wild Rice."[115]

Mesocosm experiments have exposed flaws in the underlying hypothesis that sediment iron protects wild rice from sulfide toxicity. In addition, both expert analysis and review of field survey data reveal problems with predictions and policy in the MPCA's proposed formula. Finally, real world evidence of effects on wild rice health and abundance of sulfate concentrations similar to those MPCA has proposed as "protective" undermines the claim that MPCA's proposed equation-based sulfate standard would adequately protect wild rice.

In 2015, a technical advisor to the MPCA, Dr. David Schimpf, commented that the MPCA's proposal based on the "presence" of wild rice, without regard to its abundance, "redefines 'protect wild rice' into a much weaker sense than that of the existing standard."[116] Rather than accept a finding of wild rice "presence" at various sites as an indication that wild rice can tolerate elevated sulfate levels, it is necessary to review what has happened to wild rice abundance under high sulfate and sulfide conditions.

In his Technical Review, Dr. Pastor noted that data from MPCA's field survey demonstrates a decline in wild rice abundance at sulfide concentrations above 75 µg/L, which is below MPCA's proposed EC10 of 120 µg/L. He cautioned that a standard that is based on 5% wild rice cover may not protect wild rice sustainability.[117] Dr. Pastor further explained that the MPCA's proposal to calculate a "protective" sulfate concentration to attain a sulfide level of 120 µg/L, would allow sulfate concentrations more than an order of magnitude above the current sulfate limit of 10 mg/L in many cases and could sometimes result in allowing sulfate concentrations two orders of magnitude higher than the current standard, noting that a "protective sulfate concentration" for the St. Louis River Estuary would range from 99.5 mg/L to 241.1 mg/L, while the MPCA's "protective" concentration of sulfate for the Embarrass River would be 1248.9 mg/L.[118]

Dr. Pastor reviewed MPCA field survey data showing that over 70% of wild rice ecosystems in in the field survey sites were found in sulfate concentrations of 10 mg/L or less and 94 % are

[113] *Id*., p. 6, pertinent data provided in Attach. 4 to Roberts Memorandum 2017.
[114] *Id*., p. 7.
[115] *Id*., p. 7
[116] Schimpf Comments, 2015, *supra*, Exhibit 21, p. 2.
[117] Pastor Technical Review 2017, *supra*, p. 6.
[118] *Id*., pp. 6-7.

found in lakes or streams with sulfate concentrations below 50 mg/L.[119] He concluded that even though the MPCA field survey was designed to study sites with wild rice present despite high sulfate levels (MPCA, 2014), the field survey findings strongly corroborate Moyle's (1944) conclusions.[120]

Dr. Pastor highlighted data from Sandy Lake, a water body that has received sulfate and iron discharge since the mid-1960s from U.S. Steel's Minntac tailings basin, as an example of the decline of wild rice populations in the presence of sulfate exceeding the existing 10 mg/L standard despite high sediment iron concentrations. The MPCA sampled water and sediment and counted wild rice stem density in Sandy Lake 10 times from June through September in 2013, finding wild rice largely absent except for two sampling events with very low densities (0.6 stems per m^2 on Sept. 17 and 3.8 stems per m^2 on Sept. 21 in another location).[121]

The sediment of Sandy Lake has high iron content, an average of 23,540 ug/g, which is nearly three times the statewide average (8800 ug/g) for all non-paddy wild rice water bodies sampled by MPCA. Dr. Pastor found that the average calculated allowable sulfate concentration using MPCA's flexible standard (79 mg/L) is not significantly different from the sampled average actual sulfate in Sandy Lake (95 mg/L).[122] Reviewing this data and his knowledge about wild rice ecology at Sandy Lake, Dr. Pastor concluded:

> If MPCA's model is correct, then wild rice should be present and abundant in Sandy Lake because of the high sediment iron content and the similarity of the concentration of sulfate in the water compared to the allowable sulfate concentrations. And yet, despite the high iron content of the sediment, MPCA could barely find any wild rice in Sandy Lake. Although wild rice is present in Sandy Lake and thus appears in MPCA's modeling as a lake with wild rice despite high sulfate concentrations the populations of wild rice in Sandy Lake are clearly not healthy, especially compared to what is known to have been present in the past.[123]

Sandy Lake historically "produced good stands of wild rice" and, "Wild rice harvesters utilized the lakes when suitable crops were present." The 1854 Treaty Authority summarized, "Rice production generally declined through the 1970s and 1980s, with little or no rice found in the lakes during a 1987 survey. Rice production has since remained poor."[124] MPCA has also acknowledged that Sandy Lake is near the largest tailings basin in Minnesota "which is known to leak sulfate into surface and ground water" and that "The site is controversial, having lost its documented wild rice population."[125]

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[119] *Id*., p. 7.
[120] *Id*.
[121] *Id*., p. 8.
[122] *Id*.
[123] *Id*.
[124] 1854 Treaty Authority, Sandy Lake and Little Sandy Lake Monitoring (2010-2016), Dec. 2016, autop. 2, Exhibit 49.
[125] Email MPCA (E. Swain) to C. Pollman re Sandy Lake Sites, May. 14, 2015, Exhibit 50.

Sandy Lake is not unique. Other water bodies demonstrate impairment of wild rice downstream of mining sulfate discharge despite high levels of sediment iron.[126]

The lower Partridge River is a wild rice water impacted by historic and existing iron and sulfate discharge from the LTVSMC taconite mine and tailings basin; it would be downstream of sulfate discharge from the proposed PolyMet copper-nickel mine project.[127] MPCA's Technical Support Document states that the lower Partridge River (S007-443) should be considered a "false positive," where wild rice is present despite sulfate levels above 10 mg/L (average sampled level of 24.1 mg/L) and sulfide levels below 120 µg/L.[128] Under the MPCA's proposed equation, calculated "protective" sulfate concentrations ranged from 104.3 mg/L to 571.7 mg/L depending on the sampling date, any of which would allow PolyMet a massive potential increase in sulfate.[129]

However, if Minnesota's existing wild rice sulfate rule were preserved, the lower Partridge River would be considered an impaired water under the Clean Water Act[130] subject to study and reduction of sulfate levels. In fact, in its August 2013 draft proposal for an initial list of wild rice impaired waters, the MPCA proposed to list the lower Partridge River as an impaired water.[131]

In asserting that the lower Partridge River should be considered a "false positive," the MPCA looked only at its equation, not at the wild rice. Leonard Anderson, a biology teacher, avid researcher, hand harvester, and citizen scientist for decades, reported his field observations of wild rice in the lower Partridge River to the MPCA in 2010:

> Four of us paddled the lower Partridge and adjacent St Louis River reaches. Above the junction with the Partridge River at river mile 161, the St Louis River was full of high quality rice with several hundred waterfowl feeding and resting in the rice. Next, we entered the lower Partridge River and searched for wild rice. There were stands there, but they were in such poor health that even though we were there to harvest wild rice, the plants were so stunted that you could not bend the stalks over the side of a canoe to harvest the grain. The plants averaged about 10 inches in height and the color was more reddish than green. Most plants had no viable seed. [132]

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[126] Although information on calculated protective sulfate concentrations is not widely available – WaterLegacy obtained spreadsheets used in this report under the Data Practices Act – mining companies have shared with MPCA their analysis of MPCA's equation results. See Barr, Sampling Locations with Data Used to Calculate Proper Proposed Sulfate Concentration (165 µg/L), 2015 (found in MPCA, E. Swain paper files), Exhibit 51.

[127] MPCA proposes to list the lower Partridge River (04010201-552) as a wild rice water in Minn. R. 7050.0471, Subp. 3(B)(44) This is the same water body as S007-443, as shown in MPCA Wild Rice Waters database July 19, 2016, Exhibit 52. For relationship to PolyMet proposed mine, see MPCA Staff Recommendation, Revised Draft Waters Used for the Production of Wild Rice – Partridge and Embarrass Rivers, Aug. 13, 2012, Exhibit 53 (MPCA, Draft PolyMet WR Waters).

[128] MPCA, TSD, p. 61.

[129] MPCA Field Survey data with CPSC, Attach. G to Pastor Technical Review 2017, *supra*.

[130] Clean Water Act Section 303(d), 33 U.S.C. § 1313(d)

[131] Exhibits to WaterLegacy Petition for Withdrawal of Authority, *supra*, Exhibit 16, p. 400.

[132] Preserve Minnesota's Wild Rice Standard, *supra*, Exhibit 1, Field Observation of Wild Rice Waters, pp. 3-4.

Len Anderson noted that data from John Moyle, documented in DNR Fisheries Report No 69, April 2, 1944, showed sulfate concentrations of only 0.3 mg/L in the Partridge River. He concluded, "Recent impacts of mining have raised sulfate levels to the point that natural wild rice beds are no longer productive, but are still alive."[133]

Embarrass Lake is another wild rice water downstream of historic LTVSMC taconite mining discharge and downstream of potential discharge from the proposed PolyMet copper-nickel mine tailings basin.[134] According to the MPCA, survey results from 2009 and 2010 showed "the presence of several small areas of sparse wild coverage along much of the shoreline" of the lake, "indicating that lake/shoreline conditions are conducive to the presence of wild rice" in amounts sufficient to be used as a food source for wildlife, although 2011 surveys found no wild rice.[135] The U of M field survey found no wild rice in either 2012 or 2013.[136]

Tribal scientists have long expressed concern about the impacts of mining pollution on the Embarrass River chain of lakes, including Embarrass Lake. A 2010 letter from the Grand Portage Band of Chippewa to state and federal agencies explained, "natural wild rice is no longer dense in the upper portion of the Embarrass River due to inundation of polluted water from the LTV area 5 mine pit lake and tailings basin discharges," The Band emphasized that the historic concentration of sulfate measured by Dr. Moyle in the 1940's, before the mining impacts was 0.2 mg/L.[137]

Field survey sulfate levels in the Embarrass Lake averaged 18.5 mg/L. Based on high but fluctuating iron levels, the MPCA's proposed equation would set a "protective" sulfate concentration of 1248.9 mg/L based on the 2012 sampling or a sulfate "limit" of 1,821.2 mg/L based on the 2013 sampling.[138] Even the lowest sulfate standard calculated under the new MPCA formula would be 120 times the existing 10 mg/L sulfate rule and at least 66 times higher than the existing sulfate levels. Either of these sulfate limits could extirpate aquatic life,[139] as well as eliminating requirements for sulfate controls at PolyMet's proposed copper-nickel processing plant and tailings basin.

From his decades of hand harvesting and experience in the field, Len Anderson cautioned, "Wild rice may survive above 10 mg/L, but it does not thrive." He pleaded, "The remnant stands of wild rice in the Partridge, Embarrass and entire St Louis must be protected. . . Anything less would be a betrayal of the rights of us that harvest and eat this valued wild grain and the waterfowl that depend on it."[140]

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[133] *Id.*, p. 4
[134] MPCA proposes to list Embarrass Lake (69-0496-00) as a wild rice water in proposed Minn. R. 7050.0471, Subp. 3(B)(18). *See also* MPCA, Draft PolyMet WR Waters, Exhibit 53, *supra*, regarding location downstream of proposed PolyMet mine.
[135] *Id*., autop. 6.
[136] MPCA Field Survey data with CPSC, Appx. G to Pastor Technical Review 2017, *supra*.
[137] Grand Portage Band, Comments on PolyMet's Refined Embarrass Lake Wild Rice Mitigation, Nov. 4, 2010, pp. 3-4, Exhibit 54.
[138] MPCA Field Survey data with CPSC (sorted by water body), Attach. G to Pastor Technical Review 2017, *supra*.
[139] Concerns about sampling implementation are discussed in these comments *infra*, Section 7.
[140] Preserve Minnesota's Wild Rice Standard, *supra,* Exhibit 1, Field Observation of Wild Rice Waters, p. 4.

Based on his academic and research experience, Dr. John Pastor has concluded:

> Both experimental research and field data suggest that sulfate concentrations above 10 mg/L may not protect wild rice and that sulfate concentrations an order of magnitude or more above 10 mg/L, as would be allowed in some water bodies by MPCA's proposed flexible standard, are likely to result in decline and extinction of wild rice over time.[141]

MPCA's proposal to use a formula to allow elevated sulfate concentrations in the presence of iron would not protect the designated use of waters for wild rice. This proposed rule would violate the Clean Water Act and its implementing regulations, would relieve the obligation of mining industry dischargers to control sulfate pollution, and would impair wild rice.

Changes to MPCA Proposed Rule Sections

The following sections of the MPCA's proposed rule must be rejected as unnecessary, unreasonable and inconsistent with Clean Water Act requirements:

Proposed addition to **Minn. R. 7050.0220, Subparts 3a** (line 3.17), **4a** (line 4.12), **5a** (lines 4.23 to 4.24, 5.8), **6a** (line 5.24), applying the equation in proposed 7050.0224, subpart 5, to replace the sulfate limit.

Proposed rule **Minn. R. 7050.0224, Subp. 5** (lines 7.17 to 9.12) prescribing use of an equation that would fail to protect wild rice, as well as a rule for exceedance of standards that allows excessive pollution, implementation methods biased against the protection of wild rice, and error-prone sampling of parameters by dischargers.

5) MPCA's proposal to restrict the water bodies in which any wild rice sulfate standard would apply to an arbitrary and exclusive list would remove a designated use protected under existing Minnesota rules and de-list wild rice waters identified by Minnesota state agencies, including waters downstream of existing and potential mining discharge. Such de-listing is neither needed nor reasonable and exceeds the MPCA's delegated statutory authority under the federal Clean Water Act.

Claims made in the MPCA's SONAR and in public hearings that the proposed rule would "keep the beneficial use substantially the same"[142] use an imprecision of language to obscure the MPCA's proposal to arbitrarily and capriciously remove the protection of wild rice from sulfate currently afforded by Minnesota Rules.

Minnesota Rules currently limit sulfate to 10 mg/L in waters where wild rice is "present," Minn. R. 7050.0220, Subparts 3a (31), 4a (31), 5a (19 and 6a (14), which waters are also described as "waters used for the production of wild rice." Minn. R. 7050.0224, Subp. 2. Minnesota's rules designating waters used for the production of wild rice and waters where wild rice is present were enacted in 1973 and approved by the EPA under the Clean Water Act.

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[141] Pastor Technical Review 2017, *supra*, p. 8.
[142] SONAR, p. 13. The term "beneficial use," used by the MPCA in this rulemaking is not defined in the proposed rules or in existing rules, and its meaning is unclear.

Minnesota's existing wild rice water quality standard protects wild rice from sulfate for "wildlife designated public uses and benefits." Minn. R. 7050.0224, Subp. 1. The rule also describes the value of wild rice as "a food source for wildlife and humans" and as a resource of "ecological importance." *Id*. The text of this rule, similar language in other Minnesota laws, EPA's advice on the rule's implementation, a Minnesota district court decision, and the internal record of MPCA's understandings all contradict any assertion that the existing rule protects "substantially the same" designated use as the MPCA's proposed truncated list of wild rice waters.

Rescission of Minnesota's existing protection of waters used for the production of wild rice where wild rice is present and adoption in its stead of a list of waters that excludes many known and previously designated wild rice waters is arbitrary and capricious, has no basis in science, delists wild rice waters identified by the Minnesota Department of Natural Resources in consultation with tribes, and presents a clear violation of the Clean Water Act. As with the MPCA's proposed rescission of Minnesota's existing wild rice sulfate limit of 10 mg/L in favor of an equation that would allow high concentrations of sulfate in the presence of sediment iron, the MPCA's proposed rules would fail to protect wild rice and would specifically fail to protect critical wild rice waters directly downstream of existing and proposed mining industry discharge.

The structure of the Clean Water Act is based on the states' delegated authority to establish "designated uses" of waters, set water quality standards to protect those uses, and impose effluent limits to protect the "designated uses" of waters.[143] Under the Clean Water Act and implementing regulations a state may not use a new designation to remove an existing use of a water body.[144] Existing uses are uses "actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards,"[145]

Where a "designated use" pertains to fish, shellfish, recreation or wildlife, this type of use has special protection under Section 101(a)(2) of the Clean Water Act[146] and may not be removed as a designated use of that water body without a use attainability analysis specific to that water body.[147] A use attainability assessment is a specific structured scientific assessment of the factors demonstrating that the attainment of the use is not feasible.[148] Where the designated use of a water body also involves an *existing* wildlife use protected under Section 101(a)(2) of the Clean Water Act, such as a water where wild rice has been present any time since November 28, 1975, the State may not remove that use under the Clean Water Act.[149] As the EPA has explained, "If a designated use is an existing use for a particular water body, the existing use cannot be removed unless a use requiring more stringent criteria is added."[150]

Minnesota's existing wild rice rule was enacted in 1973. On its face it would apply a sulfate limit

[143] *See e.g*. 40 C.F.R. §131.3(b)(f).
[144] 40 C.F.R. §131.10(h)(1).
[145] 40 C.F.R. § §131.3(e); 131.12(a); *See e.g.*, *Ohio Valley Envtl. Coalition v. Horinko*, 279 F. Supp. 2d 732, 751 (W. D. Va. 2003).
[146] Section 101(a)(2) of the Clean Water Act is 33 U.S.C. §1251(a)(2).
[147] 40 C.F.R. § 131.10(j).
[148] *Id*.
[149] 40 C.F.R. §131.10(h)(1).
[150] EPA, Water Quality Standards Handbook, Ch. 2: Designation of Uses (EPA-823-B-12-002-2012), p. 9, available at https://www.epa.gov/sites/production/files/2014-10/documents/handbook-chapter2.pdf

to any water body where wild rice was present or any water used for the production of wild rice as of that date. Although the Minnesota Chamber of Commerce, on behalf of its mining industry members, has asserted that the only waters "used for the production" of wild rice are agricultural rice paddies, the clear intent of Minnesota's wild rice sulfate standard was to protect "the natural and cultivated growth of wild rice."[151] In dismissing the Chamber's lawsuit challenging the existing wild rice sulfate standard as "unconstitutionally vague," a Minnesota district court judge held, "MPCA's application of the wild rice sulfate standard to protect naturally growing wild rice in ambient waters of the state is legally valid because it is consistent with the plain language of the water quality standard."[152]

Understanding the term "production" of wild rice to mean natural growth of a wildlife resource is consistent with other Minnesota statutes. Minnesota law pertaining to dams in the Mississippi River headwaters requires a plan to consider water elevations "desirable for the production of wild rice in the wild rice producing areas" and "desirable for the production and maintenance of wildlife resources."[153] State laws provide funding for wetlands and lakes for "maximum migratory waterfowl production," and explain how people can enter, use and hunt in a federal "waterfowl production area."[154] The MPCA has not disputed that Minnesota's wild rice sulfate rule refers to "the growth and harvesting of natural stands of wild rice."[155]

The plain language of Minnesota's existing wild rice sulfate water quality standard does not impose any specific numerical or narrative acreage or density requirement. The structure of Minnesota water quality designations and the history of Minnesota practice belies MPCA's claim in this proposed rulemaking that a proposed "beneficial use" of wild rice based on a minimum acreage and density is "substantially the same" as a wild rice designated use under existing law.

A joint report of the MPCA and the DNR for the Mining Simulation Project in 1990 explained the rule unequivocally; "MPCA applies a sulfate criterion to effluent discharges to waters where wild rice is present."[156] In 2001, an MPCA staff internal email from Gerald Blaha explained that the listings of specific wild rice waters in 7050.0470 "were not all inclusive, not even for the Lake Superior Basin." As a result "a determination as to whether a water supports, or has historically supported, wild rice is reflected by current and past observations of the presence of wild rice stands."[157] Mr. Blaha clarified that Class 4 waters are considered wild rice waters when wild rice is present, citing Minnesota rules preventing material degradation of fish "and other biota normally present" in any class of waters by the discharge of sewage, industrial waste, or other wastes."[158]

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[151] Wild Rice Hearing Testimony Excerpts 1973, *supra*, Exhibit 4, autop. 5.
[152] *MCC v. MPCA* (Minn. Dist. Ct.), *supra, slip op.* 14, Exhibit 2.
[153] Minn. Stat. §103G.421, Subd. 3(a)(2) and (3).
[154] Minn. Stat. §97A.075, Subd. 2(a)(1); Minn. Stat. §97A.098; Minn. R. 6240.2600.
[155] MPCA, SONAR p. 29
[156] MDNR, MPCA and Project Environment Foundation, Report on the Mining Simulation Project, Jan. 1990, p. 30, autop. 3, excerpted in Exhibit 55.
[157] MPCA (G. Blaha) Email re MOA with Indian Bands regarding Wild Rice Beds, Aug. 22, 2001, included in email string of MPCA (G. Blaha) re MOA with Indian Bands regarding Wild Rice Beds, Mar. 10, 2010, autop. 2, Exhibit 56.
[158] *Id*., quoting Minn. R. 7050.0222, subp. 7 emphasis in the original removed. Minnesota rules were recently amended so that this subpart doesn't specify biota, but it appears that biota are included in the definition of fish and the aquatic community in Minn. R.7050.0150, Subp. 4, Item I.

In its comments on the PolyMet Draft environmental impact statement (EIS) in 2010, the EPA recommended that a revised EIS apply the 10 mg/L sulfate limits given "the presence of isolated patches of wild rice in the Upper Partridge River."[159] When, in 2010, the MPCA began asking mining companies to help assess the applicability of the wild rice sulfate standard for waters in a project area, the MPCA requested a field survey "to observe whether wild rice is actually present in all waters in the project area that were determined to have the potential for wild rice."[160] In 2013, when the MPCA was proposing to list wild rice/sulfate impaired waters,[161] the MPCA stated that a water body would be considered a "water used for the production of wild rice" through an evaluation process similar to that for discharge permits: "These wild rice stands can be existing stands in a waterbody or they can be previously documented stands present within a waterbody in the recent past dating back to November 28, 1975."[162]

MPCA's proposed rules are a radical departure from Minnesota's existing rule limiting sulfate in waters where wild rice is present or was present in the recent past. MPCA's proposed rules are also a radical departure from Minnesota's existing rule and practice allowing an evidence-based process to determine whether a water supports or has historically supported wild rice.

The MPCA's proposed rule limits "wild rice waters" to the *identified* water bodies newly named in Part 7050.0471:

> Minn. R. 7050.0130, Subp. 6c. Wild rice waters. "Wild rice waters" means those water bodies that contain natural beds of wild rice as defined by Laws 2011, First Special Session chapter 2, article 4, section 32, paragraph (b), and are identified in part 7050.0471.

To emphasize that only the MPCA's *identified* wild rice waters would be protected from sulfate discharge under the new rule,[163] the MPCA's proposal continues:

> Minn. R. 7050.0224, Subp. 5, Item A. The standards in items B and C apply to wild rice waters identified in part 7050.0471 to protect the use of the grain of wild rice as a food source for wildlife and humans.

Although the MPCA was reluctant to answer questions about whether *unlisted* wild rice waters would be protected under it proposed rule,[164]the SONAR clearly states that no sulfate standard could be applied to protect wild rice, irrespective of the evidence, unless and until a rule was enacted listing that water:

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[159] EPA, Comment on PolyMet Draft EIS, Feb. 18, 2010, *supra*, p. 15, Exhibit 10.
[160] As an example, see MPCA (A. Foss) Letter to Essar Steel re Request Information on Wild Rice, Jan. 12, 2010, Exhibit 57.
[161] This effort was forestalled as a result of political pressure. *See* WaterLegacy Petition for Withdrawal of Authority, *supra*, Exhibit 15, pp. 2, 21-24; and WaterLegacy Petition for Withdrawal of Authority Exhibits, *supra*, Exhibit 16, pp. 319-415, 434.
[162] MPCA, Proposed 2013 Wild Rice/Sulfate Impaired Waters Assessment Approach, May 1, 2013, Exhibit 58.
[163] The chimera that rulemaking might add wild rice waters in the future is not relevant to determine whether the MPCA's current proposed rule would remove protection from wild rice waters.
[164] Public hearing in St. Paul, Nov. 2, 2017.

> "The proposed revisions specifically identify each water to which the numeric sulfate standard is applicable, eliminating the existing phrase "water used for production of wild rice," which resulted in the need for case-by-case determination of whether a water body met the definition." (MPCA, SONAR, pp. 14-15)
>
> "The definition of a wild rice water requires that wild rice waters must be identified in Minn. R. 7050.0471; therefore, the standard does not apply until a water is specifically identified in rule." (MPCA, SONAR, p. 15)

There are thousands of water bodies in Minnesota where wild rice is present or was present in the recent past. In 2007, the Minnesota Legislature[165] required the Minnesota Department of Natural Resources, the Minnesota agency that has been studying wild rice since the 1920s, to prepare a study of natural wild rice waters to identify threats to wild rice and make recommendations to legislative committees on protecting and increasing natural wild rice stands in the state. To fulfill these requirements, the DNR established a technical team of wild rice experts from State, Tribal and Federal governments as well as academia and the private sector.[166]

In reporting its inventory of wild rice waters to the Legislature in 2008, the DNR identified 1,292 lakes or river/stream segments where "stands of natural wild rice were present or occurred in recent history."[167] The DNR cautioned that, despite the best efforts of participants, the inventory was not a comprehensive list of Minnesota wild rice waters: "Although this inventory provides a marked improvement in our understanding of natural wild rice distribution in Minnesota, it should be considered a minimum estimate. The data for many wild rice lakes, streams and rivers is incomplete of totally lacking."[168]

Should MPCA's proposed list of wild rice waters be adopted as the exclusive list of designated wild rice waters, *337* wild rice waters listed by DNR in its 2008 report to the Legislature would no longer be designated as wild rice waters.[169]

In 2013, the MPCA submitted a call for data to various agencies and to the public at large seeking information on additional wild rice waters. In response, the DNR submitted a list of approximately 800 wild rice waters in addition to those in the DNR's 2008 inventory.[170] However, MPCA excluded from this call for data the listing of any wild rice water that did not have estimated wild rice acreage of two acres or more.[171] MPCA then declined to list

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[165] Minnesota Session Law 2007, Chapter 57, Article 1, Section 163.
[166] MDNR, Natural Wild Rice in Minnesota, Feb. 15, 2008, provided as MPCA SONAR Ex. 21, p. 1 available online at http://files.dnr.state.mn.us/fish_wildlife/wildlife/shallowlakes/natural-wild-rice-in-minnesota.pdf
[167] *Id*., p. 53
[168] *Id*., p. 12
[169] MPCA, Wild Rice Development Spreadsheet Oct. 20, 2017 (sorted), Exhibit 59; *see also* Excerpt from Oct. 20, 2017 Wild Rice Development Spreadsheet to show only listed MDNR 2008 waters rejected by MPCA for insufficient information, Exhibit 59A.
[170] MDNR (A. Geisen) and MPCA (G. Blaha) Emails re "Call for Data" Request for Wild Rice Waters, Apr. 30-May 13, 2013, with attached MDNR spreadsheet, Exhibit 60.
[171] MPCA SONAR, p. 44.

approximately 625 water bodies that DNR identified in 2013 as wild rice waters.[172] In total, for this rulemaking the MPCA declined to list 997 water bodies that others, primarily wild rice scientists at state and tribal agencies, had identified as wild rice waters.[173]

The MPCA conducted no analysis pursuant to the Clean Water Act to determine whether any wild rice waters that would currently be considered waters used for the production of wild rice met federal criteria for removal of their wild rice designated use.

The MPCA also provided no criteria in its proposed rule to justify denying protection from sulfate and sulfide of "water bodies that contain natural beds of wild rice" but are not listed in proposed Minnesota Rule 7050.0471.[174]

The record establishes that Minnesota's existing wild rice sulfate rule protects all waters where wild rice is present or has been present in recent history as waters used for the production of wild rice. What MPCA has suggested in its SONAR, despite the lack of text in its proposed rule, is that limitation of Minnesota's wild rice sulfate standard to approximately 1,300 named waters is based on defining the wild rice designated use to require "a demonstrated harvest of the wild rice by humans or evidence of the use of the grain as a food source by wildlife."[175] Even if adding another layer of proof to an existing designated use of waters were permissible under the Clean Water Act - which we believe it is not - the MPCA has failed to demonstrate any scientific basis for applying an acreage or density requirement to demonstrate a wildlife benefit.

To the extent that MPCA has "developed and applied criteria" to limit its list of wild rice waters,[176] those criteria have been a moving target. In 2013, the MPCA proposed that wild rice waters must have one-acre coverage in a lake or 0.1 acre coverage per river mile with a density of 1 stem per 0.5 square meter so that wild rice would provide 11.5 days worth of food for one Mallard duck.[177] In 2014, the MPCA proposed a minimum of 9,000 wild rice stems for a lake or 900 stems per river mile.[178] In March 2015, the MPCA proposed that a wild rice population must have a minimum of 8,000 stems in a lake or a minimum of 800 stems over a river mile, stating this amount of wild rice would feed approximately 12 ducks during a one-week migratory stop.[179] In July 2016, the MPCA proposed requiring 0.25 acres of wild rice with a stem density of at least 8 stems per square meter or 0.5 acres with a stem density of at least 4 stems per

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[172] The number of wild rice waters proposed by DNR in 2013 that are not listed by MPCA is approximate, since this information was provided in the MPCA Wild Rice Waters Draft List updated as of Jan. 25, 2017, as reflected in Exhibit 52A, showing "insufficient information" waters derived from Exhibit 52. The MPCA's October 2017 Wild Rice Development Spreadsheet, *supra*, Exhibit 59, did not separately break out which agencies proposed wild rice waters in 2013 that MPCA rejected from listing.
[173] MPCA, Wild Rice Development Spreadsheet, Oct. 20, 2017, *supra*, Exhibit 59.
[174] *See* MPCA proposed rules Minn. R. 7050.0130, Subp. 6c and Minn. R. 7050.0224, Subp. 5, Item A.
[175] MPCA, SONAR, p. 12.
[176] *Id*., p. 41
[177] MPCA, Draft Discussion Document: Defining "Water Used for the Production of Wild Rice," Jan. 7, 2013, Exhibit 61, autop. 2-3.
[178] MPCA, WUFPOWR Determinations, Mar. 3, 2014, Exhibit 61, autop. 4.
[179] MPCA's proposed approach for Minnesota's sulfate standard to protect wild rice, Mar. 24, 2015, SONAR Ex. 10, pp. 9, 21

meter.[180] Using yet a new metric for feeding ducks, the MPCA believed that this size wild rice bed would, at a minimum, meet the food energy needs of a pair of ducks for two months.[181]

MPCA staff had learned long before the current rule was proposed that there is no scientific basis to require any specific acreage or density for wild rice to benefit wildlife. In 2011, the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) staff pointed out that they knew of no "research that defines the number of plants or the density of a rice bed that would make it usable to blackbirds, muskrat, geese, or other wildlife. A single plant can provide nutrition to wildlife."[182] By spring 2016, MPCA staff had reached a similar conclusion, noting that 2015 scientific research by leaders in the field called into question whether "giving-up densities" exist, showed that ducks don't leave a location even when they are no longer feeding, and showed that food availability may be only one of the factors that determine where ducks eat.[183] The bottom line: "How small a patch would ducks use? Don't know. Many things influence this other than food availability such as lack of disturbance, escape cover and thermal cover."[184]

Tribal scientists with the Fond du Lac and Grand Portage Bands criticized the MPCA's "incongruous rationale" based on protecting a certain amount of food for ducks, emphasizing that there is "no supporting evidence that demonstrates it would be protective of wild rice waters." For trout streams, they noted, "[A] relevant analogy might be if the MPCA considered the question 'how much does a merganser duck eat?' "[185]

DNR biologists have also suggested that a plant ecology approach would be appropriate to identify wild rice waters:

> I [Donna Perleberg, DNR biologist] offered a "plant ecology" approach to the question of "what constitutes a wild rice population?" I suggested that the objective seems to be to distinguish between a "viable population" of wild rice and single plants that may be "incidental occurrences" in the waterbody. As an analogy, I suggested that if our goal was to identify cedar forests, we would not include a single cedar tree planted in a parking lot.
>
> Welby [Smith DNR botanist] supported the "plant community" approach and noted that when folks see "very dense" stands of wild rice (the MPCA photos that are being used as "good examples" of wild rice), those are anomalies from a statewide, ecological viewpoint. Wild rice may be present at a range of densities and the monotypic stand may not necessarily be the "typical" state.[186]

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[180] MPCA Draft Technical Support Document: Refinements to Minnesota's Sulfate Water Quality Standard to Protect Wild Rice (July 18, 2016), SONAR Ex. 12, pp. 8-9
[181] MPCA, SONAR, p. 61.
[182] GLIFWC, Comments on Draft Staff Recommendation: Waters Used for the Production of Wild Rice – Partridge and Embarrass Rivers, Nov. 17, 2011, p. 4, Exhibit 62.
[183] MPCA, Wild Rice Waters Criteria and Summary of discussions with DNR wildlife and wild rice staff on May 17, 2016, autop. 1, 3, 5, Exhibit 63.
[184] *Id*., p. 2.
[185] Fond du Lac and Grand Portage Bands, Comments on MPCA's March 2015 Proposed Approach for Minnesota's Sulfate Standard to Protect Wild Rice, Dec. 18, 2015, p. 4, Exhibit 64.
[186] MDNR (D. Perleberg) Email and Notes of Meeting with MPCA on Waters of Wild rice Production, Jan. 4, 2014 to Jan. 13, 2014, autop. 3, Exhibit 65. MPCA has acknowledged in discussions with Wild

MPCA's statements in the SONAR that water bodies must be two acres in size or described as "thick," "dense" or "lush" to serve as a wild rice use[187] are contrived as well as unscientific. These factors may be sufficient to justify *listing* named wild rice waters. However to exclude all other wild rice waters from sulfate water quality standard protection would conclusively presume, without evidence or recourse, that such wild rice waters provide no wildlife benefits and that they have provided no benefits at any time since November 28, 1975. Such an exclusion and conclusive presumption would be arbitrary, capricious, lacking in scientific basis, and inconsistent with the Clean Water Act.

Exclusion of wild rice beds that are small or sparse from the protection of sulfate water quality standards would not protect wild rice. Since DNR began keeping records of wild rice in the 1920s, wild rice has been lost or has greatly declined in many lakes.[188] Wild rice populations have inherent cyclic variability, so even a healthy wild rice bed may appear sparse or may not be observed during a particular monitoring year. Small isolated populations of wild rice may be necessary to preserve the genetic diversity of wild rice.[189] Perhaps most troubling, failure to protect relatively sparse wild rice from sulfate pollution may result in the complete extinction of wild rice beds already impaired as a result of sulfate discharge.

In objecting to the MPCA's proposed acreage and density criteria as insufficiently protective of wild rice, Wild Rice Advisory Committee member Len Anderson highlighted an additional concern, "Do the stands on the Partridge and Embarrass River constitute a "stand" of wild rice? I am sure the ducks think they do. If PolyMet can get these stands in effect "declassified" as a stand, then they are home free. The same could be said for Minntac and Western Lake Superior Sanitary District and many others."[190]

Even a brief review of the MPCA's proposed listing of wild rice waters demonstrates that Mr. Anderson's concerns may be well founded. Critical waters immediately downstream of existing and proposed mining discharge are excluded from the list of wild rice waters. They would receive no protection from sulfate pollution if the MPCA's proposed rule were adopted.

At the U.S. Steel Minntac tailings basin, sulfate pollution has impaired wild rice for decades and the MPCA has failed to update its discharge permit or control sulfate pollution for a quarter of a century.[191] On the east side of the tailings basin, Sandy Lake, Little Sandy Lake and the Sand River have declining stands of natural wild rice.[192] On the west side of the tailings basin, Dark

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Rice Advisory Committee members that other beneficial uses (such as trout streams) don't require a certain density of fish, so long as there is evidence that finding a fish is not an "anomaly."

[187] MPCA, SONAR, pp. 44, 47-49.

[188] MPCA (Swain), Email re historical wild rice records, Oct. 12, 2015, Exhibit 66. *See also* MPCA, Post-Hearing Response, Wild Rice Rule Amendments, described *infra*, Exhibit 78, autop. 2.

[189] L. Anderson Email to MPCA re Wild Rice Advisory Committee Meeting and attached discussion, Protecting the genetic diversity of wild rice, June 4 -8, 2015, autop. 5-6, Exhibit 67.

[190] *Id*., autop. 5.

[191] *See* WaterLegacy Petition for Withdrawal of Authority, *supra*, Exhibit 15, pp. 17-19, WaterLegacy Petition for Withdrawal of Authority Exhibits, *supra*, Exhibit 16, pp. 207-303.

[192] *See* discussion, *supra*, at p. 27.

Lake is the only water body where wild rice is present. Minnesota's wild rice water quality standard would only apply to control sulfate discharge on the west side of the Minntac tailings basin if Dark Lake were recognized as a wild rice water. [193]

The University of Minnesota field survey done for the wild rice sulfate standards study demonstrates that Dark Lake is a wild rice water. Dark Lake was surveyed on four occasions, and *wild rice was present on each occasion*.[194] MPCA has stated, "Where a site was identified as having wild rice, the MPCA added it to the proposed list of wild rice waters, with four exceptions," which were excluded because "sparse or limited wild rice plants were observed." Dark Lake was one of those four "exceptions."[195]

MPCA's exclusion of Dark Lake doesn't pass the smell test. Review of the U of M field survey data demonstrates that wild rice cover at Dark Lake wasn't exceptionally sparse. On September 5, 2013, Dark Lake had 12.8% wild rice cover and 11.8 stems per square meter. Ranked by the percentage of wild rice cover, Dark Lake was not peculiarly sparse; 67 sampling events below it and 36 individual water bodies where wild rice was present had lower rates of wild rice cover.[196] In excluding Dark Lake from its list of wild rice waters, MPCA knew that wild rice observed in Dark Lake was mature and appeared healthy.[197]

Even more salient, MPCA knew that Minntac tailings basin discharge since the mid-1960s had impacted sulfate levels in Dark Lake; sulfate measured in the field survey of Dark Lake averaged 175 mg/L, more than 17 times higher than Minnesota's sulfate standard of 10 mg/L.[198] If wild rice in Dark Lake did not currently appear abundant, MPCA need look no farther than the failure to control sulfate pollution from Minntac to understand the cause.

Even more troubling, the MPCA's proposed list of identified wild rice waters excludes the Upper Partridge River east of Colby Lake, the wild rice water that would be in closest proximity to the proposed PolyMet copper-nickel mine and potential seepage and discharge of sulfate from mine pits and mine site waste storage.[199] Both PolyMet and Great Lakes Indian Fish and Wildlife Commission (GLIFWC) maps document the presence of wild rice in the Upper Partridge River, immediately downstream of the proposed PolyMet mine.[200] The EPA's comments on the

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[193] WaterLegacy, Minntac Tailings Basin Draft Permit Comments, Dec. 23, 2016, p. 11, Exhibit 68; *see also* MPCA, Minntac Tailings Basin Aerial Photo from Draft Permit, Exhibit 69.
[194] U of M Field Survey Data for MPCA (pertinent columns sorted by water body), Feb. 6, 2015, Exhibit 70.
[195] MPCA SONAR, p. 44.
[196] U of M Field Survey Data for MPCA (pertinent columns sorted by wild rice coverage), Feb. 6, 2015, Exhibit 70A. Sorting by average stems per square meter has a similar result; 61 sampling events below it and 36 individual water bodies where wild rice was present had lower stem counts.
[197] MPCA (G. Blaha) Emails re Dark Lake 9/5/2013 Survey Update, Sept. 6, 2013, autop. 1, Exhibit 71.
[198] U of M Field Survey Data (sorted by water body), *supra*, Exhibit 70. Porewater sulfide also averaged 156 µg/L, above the MPCA's proposed sulfide threshold.
[199] MDNR et al. PolyMet NorthMet Final EIS, Figure 4.2.2-1 Watersheds Map, Nov. 2015, Exhibit 72.
[200] PolyMet, 2009 Wild Rice and Sulfate Monitoring and 2010 Wild Rice and Water Quality Monitoring Report excerpt maps, autop. 8, 16, Exhibit 73; GLIFWC, Comments on Draft Staff Recommendations Waters Used for the Production of Wild Rice – Partridge and Embarrass Rivers, *supra*, map on autop. 10, Exhibit 62

PolyMet draft EIS in 2010 also specifically cited the presence of wild rice in the Upper Partridge River.[201]

In this case, there is no question that, absent the MPCA's proposed delisting of wild rice waters, the Upper Partridge River would have been protected from sulfate pollution. MPCA's internal documents confirm that, by August 13, 2012, the MPCA had determined, "*The lower portion of the 'upper' Partridge River, from river mile approximately 22 just upstream of the railroad bridge near Allen Junction in the NW1/4, Sec. 15, T58N, R14W to Colby Lake, is a water used for production of wild rice."*[202]

Although the MPCA's proposed list of wild rice waters includes three segments of the Partridge River, the latitude and longitude for each of these reaches indicates that they are in the "lower" Partridge River, west from Colby Lake and farther downstream of the impacts of sulfate discharge from the proposed PolyMet sulfide mine.[203] The Upper Partridge River is neither identified in the MPCA's table of wild rice waters rejected for listing due to "insufficient information" nor illustrated on the MPCA's public map of wild rice waters.[204] The SONAR does not mention, let alone explain why the water used for production of wild rice closest to the proposed PolyMet mine has been excluded from protection from sulfide discharge.

WaterLegacy doesn't know how many other wild rice waters downstream of existing sulfate dischargers and proposed sulfide mines have been excluded from the MPCA's proposed list of wild rice waters. Whether this exclusion is intentional, inadvertent or simply due to the limits of a listing process which does not consider evidence case-by-case when the threat to wild rice is imminent, the failure to list critical wild rice waters downstream of the Minntac and proposed PolyMet mine facilities highlights deficiencies of the MPCA's proposed rule. Changing Minnesota's existing designation of waters protected from sulfate pollution when wild rice is present to an arbitrary and exclusive list of wild rice waters is unreasonable, unnecessary, capricious, and inconsistent with the MPCA's delegated authority under the Clean Water Act and would fail to protect the use of waters for wild rice to benefit wildlife as well as human beings.

Changes to MPCA Proposed Rule Sections

The following sections of the MPCA's proposed rule must be rejected as unnecessary, unreasonable and inconsistent with Clean Water Act requirements:

> Proposed phrase in **Minn. R. 7050.0130, Subp. 6c** (line 2.3) stating "and are identified in part 7050.0471," which sets an arbitrary limit excluding hundreds if not thousands of "wild rice waters." Water Legacy proposes either to place a period after the words "paragraph (b)"

[201] U.S. EPA, Comment on PolyMet Draft EIS, *supra*, Exhibit 11 at p. 15, autop. 19.
[202] MPCA, Draft PolyMet WR Waters, *supra*, Exhibit 53, autop. 2 and map at autop. 13.
[203] Excerpt from MPCA Wild Rice Development Spreadsheet, *supra*, Exhibit 59, providing latitude and longitude of proposed Partridge River wild rice waters, Maps of (Lower) Partridge River locations by longitude and latitude, Exhibit 74.
[204] MPCA's listed and "insufficient information" wild rice waters are shown in MPCA's Wild Rice Development Spreadsheet, Oct. 20, 2017, *supra*, Exhibit 59. See also MPCA's maps and listing at https://public.tableau.com/profile/mpca.data.services#!/vizhome/wild_rice_v4/Story?publish=yes

on line 2.3 or to change the phrase after "paragraph (b)" to read " ~~and are~~ including wild rice waters identified in parts 7050.0470, subp. 1 and 7050.0471."

Proposed deletion of **Minn. R. 7050.0220, Subparts 3a (31)** (lines 3.15 to 3.16), **4a (31)** (lines 4.10 to 4.11), **5a (19**) (lines 5.7 to 5.8), **6a (14)** (lines 5.22 to 5.23) removing existing limit for sulfates of 10 mg/L where "wild rice present." WaterLegacy would not object to using the phrase "in wild rice waters" in place of the phrase "wild rice present" if the definition of "wild rice waters" were changed as proposed immediately above.

Proposed phrase "4D when applicable to a wild rice water listed in part 7050.0471" arbitrarily limiting protection of water quality standards to certain wild rice waters in proposed rule change for **Minn. R. 7050.0220, Subp. 1 (B)(1)** (lines 2.19 to 2.20), **(B)(2)** (lines 2.22 to 2.23), **(B)(3)** (line 3.3), **(B)(4)** (line 3.5); Subp**. 3a** (lines 3.8 to 3.9); **Subp. 4a** (line 4.3); **Subp. 5a** (lines 4.20 to 4.21); **Subp. 6a** (line 5.14). If MPCA's equation is rejected, "4D" waters also need not be specified.

6) MPCA's proposed rule stating criteria by which wild rice waters can be added in future rulemaking is unnecessary, arbitrary and provides no benefit to those seeking to protect wild rice from sulfate pollution.

The MPCA's proposed rule section requiring that the commissioner must solicit evidence that supports identifying additional wild rice waters as part of triennial review[205] is, at best, superfluous.

The triennial review process is mandated by the Clean Water Act and its implementing regulations. Federal regulations already require that, at least once every three years, States must hold public hearings for the purpose of reviewing applicable water quality standards. In this process, "Any water body segment with water quality standards that do not include the uses specified in section 101(a)(2) of the Act shall be re-examined every three years to determine if any new information has become available." Further, if new information indicates that a Section 101(a)(2) use such as a wildlife use is attainable, "the State shall revise its standards accordingly."[206]

As compared with having no language at all, the proposed rule adds *no* requirements that would increase the likelihood that additional wild rice waters would be listed in rulemaking. It would provide no benefit to citizen stakeholders or tribal rights holders who seek to protect wild rice.

More troubling, the MPCA's proposed text on triennial review perpetuates the arbitrary and unscientific barriers to listing wild rice waters that were described in the preceding section and provides a particular barrier to acceptance of tribal oral histories. MPCA's proposed Minnesota Rule 7050.0471, Subpart 2 should be rejected in its entirety as unnecessary, unreasonable and inconsistent with the protection of wild rice from sulfate pollution.

[205] MPCA proposed Minn. R. 7050.0471, Subp. 2 (lines 11.18 to 12.6).
[206] 40 C.F.R. §131.20(a).

The MPCA's removal of designated uses of Minnesota waters for the production of wild rice by excluding all waters where wild rice is present that are not on its list is not "saved" by the triennial review provisions. The MPCA has used this provision to underscore that - irrespective of evidence - it will not add any wild rice water prior to additional rulemaking.[207]

Although the MPCA's proposed text requires triennial solicitation of evidence for identifying additional wild rice waters, it neither requires rulemaking at any future time nor describes any situation where the MPCA would be required to list an additional wild rice water.[208] MPCA's SONAR makes it clear no one should expect new rulemaking to add wild rice waters: "Amending water quality standards is a complicated, time consuming, and resource-intensive process and a number of factors determine when the MPCA proposes rulemaking."[209] To ensure that nobody would think that listing acceptable evidence of wild rice waters might create an obligation to list an additional wild rice water, the MPCA has also insisted that types of information the Agency will seek "are not criteria that automatically identify a water as a wild rice water."[210] In fact, any additional wild rice water proposed would require a Statement of Need and Reasonableness.[211]

As discussed in the preceding section, there is no scientific basis for requiring a cumulative total of at least two acres of wild rice in order to identify a water body where wild rice provides a benefit to wildlife. The concept that a "wild rice beneficial use" can only be demonstrated by showing human harvest or the "use of the grain for food for wildlife" suggests that an undefined something beyond the fact that wild rice was present must be proved, [212] creating yet another barrier to the listing of wild rice waters.

The way in which the proposed triennial review describes written or oral histories provides yet one more reason to reject this proposed text. Oral histories of wild rice harvest are particularly salient to protection of tribal Treaty resources and are often referenced in tribal comments. Although the SONAR[213] and MPCA's hearing presentations may suggest that MPCA "recognizes the validity of written or oral histories about wild rice," the proposed rule text belies this assertion. Written or oral histories about wild rice are only "acceptable" as evidence if they "meet the criteria of validity, reliability, and consistency."[214] No other form of evidence must meet these criteria to be considered "acceptable."

This "triennial review" provision is at best ineffectual and, at worst, an impediment to protection of additional wild rice waters and an unfortunate disrespect of oral histories. It should be rejected as unnecessary and unreasonable.

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[207] MPCA, SONAR pp. 58-59
[208] MPCA proposed Minn. R. 7050.1471, Subp. 2.
[209] MPCA, SONAR, p. 59.
[210] *Id*., p. 63.
[211] *Id.*
[212] Proposed Minn. R. 7070.0471, Subp. 2 (lines 11.20 to 11.24) states "The evidence must demonstrate that the wild rice beneficial use exists or has existed on or after November 28, 1975, in the water body, such as by showing a history of human harvest or use of the grain as food for wildlife."
[213] MPCA, SONAR, p. 62.
[214] MPCA proposed Minn. R. 7050.0471, Subp. 2, Item A.

Changes to MPCA Proposed Rule Sections

The following sections of the MPCA's proposed rule must be rejected as unnecessary, unreasonable and inconsistent with Clean Water Act requirements:

Proposed subpart **Minn. R. 7050.0471, Subp. 2** (lines 11.18 to 12.6) should be rejected in its entirety.

7) MPCA's proposed implementation mechanisms for its sulfate equation are biased against protection of wild rice and inconsistent with any effective implementation of water quality standards. They are neither needed nor reasonable and conflict with the MPCA's delegated authority under the Clean Water Act.

MPCA's proposed implementation mechanisms for its sulfate equation are biased against protection of wild rice. They protect dischargers rather than wild rice under low-flow conditions. Although the MPCA has acknowledged that maintaining a seasonal limit on sulfate is inconsistent with scientific research, annual averaging of pollution levels and allowance of years of exceedance is unprecedented and inconsistent with application of chronic water quality standards under the Clean Water Act. The proposed sampling by dischargers invites manipulation, exacerbating the unprotective nature of an equation allowing elevated sulfate discharge in the presence of iron.

In addition, MPCA's proposed methods for divergence from equation-based standards are one-sided, facilitating implementation of a less-stringent water quality standard but not a more-stringent limit. The proposed rules contain a prohibition on setting wild rice sulfate limits if the commissioner determines that wild rice beneficial use won't be harmed. This provision has the potential to undermine the application of any water quality standard at all. In its supporting documents, MPCA seems to invite variances and predict years of delay, suggesting that the proposed rules are intended to continue the State's practice and policy of avoiding the imposition of controls on sulfate discharge irrespective of adverse impacts on wild rice and aquatic ecosystems.

None of these provisions were suggested by the Session Law authorizing the rulemaking. Most of these provisions were never discussed with the Wild Rice Standards Study Advisory Committee. Many are inconsistent with Clean Water Act regulations and guidance as well as unprecedented in Minnesota law.

Low Flows
First, the MPCA's proposed rules adopt a novel rule undermining the protection of wild rice from sulfate under low-flow conditions. Under Minnesota water quality standards, point and nonpoint sources of water pollution "shall be controlled so that the water quality standards will be maintained at all stream flows that are equal to or greater than the 7Q10 for the critical month or months unless another flow condition is specifically stated as applicable in this chapter." Minn. R. 7050.0210, Subp 7.[215] A 7Q10 is the lowest seven-consecutive-day average in 10 years.

[215] A thirty-day ten-year flow (30Q10) is allowed under Minnesota rules for ammonia discharge. Minn. R. 7053.0205, Subp. 7, Item B; 7053.0135, Subp. 4. A122Q average over the summer months is allowed in

Requiring that water quality standards be maintained at the "7Q10" means that, even with low dilution based on the lowest 7-day flow in a 10-year period, the concentration of the pollutant won't be exceeded. For a small stream, the 7Q10 might be zero, so no dilution at all might be applicable to relax the application of a pollution standard.

Protection of fish, aquatic biota, wildlife or recreational uses from pollutants under low-flow conditions is part and parcel of Clean Water Act regulations requiring that water quality criteria protect designated uses.[216] EPA guidance explains, "To ensure that adopted criteria are protective of the designated uses, states and tribes generally establish critical low-flow values to support implementation of the applicable criteria through such programs as NPDES permitting."[217] Under the Clean Water Act, appropriate low-flow values are important to protect designated uses, "Low flows in the receiving water typically aggravate the effects of effluent discharges because, during a low-flow event, there is less water available for dilution, resulting in higher instream concentrations of pollutants."[218] EPA has generally approved a 7Q10 value to implement chronic criteria, and has also approved a "4B3" value, representing the lowest four-consecutive-day average flow event expected to occur within three years.[219]

The MPCA's proposed rule for control of sulfate would apply a "365Q10," allowing dilution based on the annual average ten-year flow.[220] Uniquely, discharges of sulfate in sewage, industrial waste or other wastes affecting wild rice waters would be able to relax the applicable pollution standard to take into dilution averaged over an entire year.[221]

In practice, the MPCA would allow every sulfate discharger to use year-round dilution based on averaging of snow melt and other highest water flow conditions even if the discharge were taking place during the driest week of the year, when far less flow would be available to dilute sulfate pollution. MPCA's proposed rule would relax pollution limits based on annual average flow even in shallow streams, common natural habitats for wild rice, which may have little or no flow available to dilute pollution.

The MPCA's proposal to use a dilution rate based on annual average flows would make application of sulfate criteria in discharge permits less stringent. This unprecedented dilution allowance would conflict with Clean Water Act regulations and guidance and fail to protect the designated use of waters for growth of wild rice.

Annual Average Sulfate

Current Minnesota law limiting sulfate to 10 mg/L in waters where wild rice is present applies to "periods when the rice may be susceptible to damage by high sulfate levels." Minn. R.

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reservoirs, where the volume of water and residence time is controlled. Minn. R. 7050.0150, Subp. 4, Item W.

[216] 40 C.F.R. §131.11(a). State implementation policies pertaining to low flows are specifically subject to EPA review and approval under the Clean Water Act. 40 C.F.R. §131.13.

[217] EPA, Water Quality Standards Handbook, Ch. 5: General Policies, EPA 820-B-14-004 Sept. 2014, p. 11, https://www.epa.gov/sites/production/files/2014-09/documents/handbook-chapter5.pdf

[218] *Id*.

[219] *Id*., p. 13.

[220] MPCA proposed definition in Minn. R. 7050.0130, Subp. 2a and Minn. R. 7053. 0135, Subp. 2a, where this definition is incorporated by reference.

[221] MPCA proposed text describing sulfate control requirements in Minn. R. 7050.0224, Subp. 5, Item D and 7053.0205, Subp. 7, Item E incorporates the average annual flow.

7050.0224, Subp. 2. In 2012, MPCA applied this provision to avoid application of an effluent limit based on the10 mg/L sulfate standard for the Mesabi Nugget iron processing facility. Mesabi Nugget, which accumulated sulfate and other pollutants in a huge pit, was issued a permit that restricted discharge from this pit during spring and summer months, rather than applying an effluent limit for sulfate to protect wild rice.[222] WaterLegacy objected to MPCA's plan to allow seasonal release of elevated sulfates rather than require pollution prevention and control.

As required by the 2011 legislation, the Wild Rice Sulfate Standards Study included research to determine during what times wild rice was susceptible to sulfate discharge. University of Minnesota scientists concluded that, regardless of cold temperatures, a vast majority of the sulfate added to sediments reacts to form sulfide.[223] The MPCA accepted this finding; "The current scientific understanding is that sulfide in the porewater affects wild rice health and that the creation of this sulfide occurs throughout the year . . .the phrase "periods when the rice may be susceptible" is no longer scientifically supported. Essentially, wild rice is susceptible at all times.[224]

Research demonstrating that wild rice is susceptible to sulfate discharge and formation of sulfide year-round should preclude a permitting strategy, like that used for Mesabi Nugget, to allow elevated sulfate discharge during the fall and winter to avoid the wild rice sulfate standard. But the MPCA's proposal to use an annual average concentration of sulfate to determine if a numeric sulfate standard is exceeded[225] could similarly reduce the need for strict compliance. Applying an annual sulfate average means that on any given day or in any given month sulfate concentrations in a wild rice water could be higher than the numeric limit, "as long as the value averaged over the whole year is below the numeric sulfate standard."[226]

MPCA attempts to justify use of an annual average since sulfate is not a direct toxicant upon wild rice.[227] However, other pollutants controlled by water quality standards are not direct toxicants. Discharge limits for mercury, for example, are set to prevent the methylation of mercury and the bioaccumulation of mercury in the aquatic food chain. Mercury monitoring and effluent limits are generally based on a daily maximum and a calculated monthly

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[222] *In the Matter of the Reissuance of NPDES/SDS Permit No. MN0067687, Including a Variance from Water Quality Standards, to Mesabi Nugget Delaware, LLC, St. Louis County Hoyt Lakes, Minnesota*, Findings of Fact Conclusions of Law and Order, Oct. 24, 2012, p. 15, Exhibit 75. The MPCA also granted Mesabi Nugget a variance from water quality standards for hardness, bicarbonates, total dissolved salts and specific conductance, which variance was overturned by the EPA as a result of litigation by the Fond du Lac and Grand Portage Bands, WaterLegacy and MCEA. *See* U.S. EPA Letter to MPCA re EPA Disapproval of Variance for Mesabi Nugget Delaware, LLC, July 2, 2014, Exhibit 76. The Mesabi Nugget plant has not operated since January 2015, and the permit has not been updated.

[223] W. DeRocher, N. Johnson, *Temperature Dependent Diffusion Rates of Sulfate in Aquatic Sediments*, Report Dec. 31, 2013, available at ftp://files.pca.state.mn.us/pub/wild_rice/Johnson_Sediment_Incubation_Experiment/Temperature_Dependent_Diffusion_Rates_of_Sulfate_in_Aquatic_Sediments_final.pdf

[224] MPCA, SONAR, p, 20.

[225] MPCA proposed Minn. R. 7050.0224, Subp. 5, Item B.

[226] MPCA, SONAR, p. 79.

[227] MPCA, TSD, p. 91.

average.[228] EPA guidance generally recommends that water quality criteria for chronic water quality standards be implemented with an averaging period no longer than 30 days.[229]

MPCA further proposes that its implementation of any equation-based wild rice sulfate limit would include no maximum daily sulfate concentrations, since to do so would be "over-protective" or "overly restrictive."[230] In an NPDES permit, MPCA proposes that effluent limits for sulfate "will typically be expressed as a 12-month moving total mass," rather than with concentration limits.[231] We have been unable to identify any other modern water quality standard applied in this manner.

With a mass-based annual limit, a sulfate discharger could discharge hundreds or even a thousand of parts per million of sulfate in wild rice waters during a time of low water flow, threatening wild rice sustainability and aquatic life. The MPCA's proposal for annual averaging and mass based limits is inconsistent with Clean Water Act guidance and with the protection of the designated use of waters for wild rice.

Years of Violation

MPCA's proposed rules discussed so far would allow a higher level of sulfate than that suggested by the calculated sulfate standard due to the use of annual flow averaging. They would further would reduce the need for sulfate controls by using an annual average for compliance, rather than the customary and recommended daily maximum and monthly average. In addition, even if sulfate was elevated over an entire year, the proposed rules would only consider this an "exceedance" of the standard if the discharger violated the wild rice sulfate standard for more than one year out of ten.[232]

Minnesota rules describe "frequency" as the number of times that a water quality can be exceeded in a specified period of time without causing acute or chronic toxic effects on an aquatic community, human health or wildlife.[233] There is no scientific data supporting the MPCA's recommendation that a wild rice sulfate standard could be exceeded for a full year every ten years without harming wild rice.

The MPCA has assumed that porewater sulfide would diminish if sulfate in surface water is reduced after a year,[234] but there is no experimental or field evidence to confirm that assumption. The MPCA cited Dr. Pastor's 2016 mesocosm research[235] where three plants in two mesocosms

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[228] See for example, Aitkin Agri-Peat Inc. – Cromwell Location NPDES/SDS Draft Permit MN0055662, June 2013, Excerpts, Exhibit 77.
[229] EPA Water Quality Standards Handbook Ch. 3: Water Quality Criteria, EPA 823 B 17 001 2017, p. 15, available at https://www.epa.gov/sites/production/files/2014-10/documents/handbook-chapter3.pdf
[230] MPCA, TSD, p. 94; MPCA, SONAR, p. 80.
[231] MPCA, SONAR, p. 105.
[232] MPCA proposed rules Minn. R. 7050.0224, Subp. 5, Item B.
[233] Minn. R. 7050.0218, Subp. 3, Item AA.
[234] MPCA, TSD, p. 95.
[235] MPCA, TSD, p, 96 *citing* Pastor, J. 2017b, Progress Report on Experiments on Effects of Sulfate and Sulfide on Wild Rice, June 28, 2017, Report to the Fond du Lac Band of Lake Superior Chippewa, Cloquet, Minnesota. That Progress Report, provided with Dr. Pastor's Technical Review, *supra*, as Attachment E, described experiments designed to test the MPCA's theory that iron mitigated sulfide toxicity to wild rice resulting from elevated sulfate. The Progress Report concluded at p. 3, "Iron additions may partly ameliorate sulfide toxicity to seedlings in spring, but precipitation of iron sulfide

out of five had plants germinate when sulfate additions stopped for a year to claim that "it is unlikely that one year of elevated sulfate will have will have a long-term negative effect on wild rice growth and reproduction, so long as sulfate concentrations do not remain elevated above the allowable annual average for multiple years in a row."[236]

The MPCA did not explain how the germination (not even seed production) of three plants in less than half of a tiny sample in one year demonstrated the absence of adverse effects on a wild rice population or how the complete cessation of sulfate loading to a tank would compare to ongoing sulfate discharge, which would continue, even if a facility complied with its permit in future years. The MPCA cited no experimental or field data to support its assertion, "A waterbody's wild rice population will be able to persist at a high average stem density if the annual average sulfate concentration does not exceed the calculated standard very often."[237] MPCA then admitted it had little basis to define what "very often" means: "Because of the limitations of available environmental knowledge, the severity of an excursion cannot be rigorously related to the impact on a wild rice population. Nevertheless, MPCA expects that a wild rice population will not be significantly harmed by an exceedance that occurs only once in ten years."[238]

Dr. John Pastor reviewed the MPCA's claims, allegedly based on his mesocosm data, that concentrations of sulfate above the allowable standard in one year out of ten would not have a significant impact on wild rice populations in the long run. He disagreed with the MPCA's inference that his experiments support its conclusion:

> While I agree that it is important to determine the allowable frequency and degree of excursions to avoid impacts on wild rice, I must also point out that our experiments were not designed to determine what these might be. At present, a one-in-ten year allowable excursion is premature and requires further experiments designed specifically to determine what level of excursions does not harm the long term sustainability of wild rice populations.[239]

The Clean Water Act requires that implementation of water quality standards, including the length and frequency of allowable excursions, be set to assure the protection of the designated use of waters. There is no precedent and no federal guidance that would endorse one year out of ten years of excursion above a water quality standard, particularly when the exceedance itself would have resulted from year-long average pollution above the standard. MPCA's unsupported "expectations" that negative effects will not be "long-term" or that a population will not be "significantly harmed" are neither appropriate under Minnesota rule describing "frequency" nor consistent with the Clean Water Act. MPCA's proposal to allow standard must be rejected as unscientific, unreasonable and inconsistent with the Agency's delegated authority under the Act.

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plaques on roots during the flowering and seed production period of wild rice's life cycle appears to block uptake of nitrogen, leading to fewer and smaller seeds with reduced nitrogen content." Neither the MPCA's TSD nor its SONAR mention these tests of the iron mitigation hypothesis.

[236] MPCA, TSD, p. 96. *See also* MPCA, SONAR, pp. 82-83.

[237] MPCA, SONAR, p. 83.

[238] *Id*.

[239] Pastor Technical Review 2017, *supra*, p. 5.

Sampling by Dischargers
MPCA has proposed that, at least for new or expanding dischargers, the discharger rather than the Agency will be responsible for selecting sediment sample areas and conducting sampling. This implementation proposal is an invitation to mischief and should be rejected as unreasonable and unlikely to protect wild rice.

These comments have previously highlighted the degree of variability in sampling results for sediment iron and sulfide in the University of Minnesota field survey.[240] Even when researchers were unbiased and had no financial interest in the outcome of the sampling, a calculated "protective" sulfate concentration based on sediment sampling could allow more than eight times as much sulfate as would be allowed if a sample were taken on another date in the same water body. If samples were taken in different locations within a waterbody, the variability could exceed two orders of magnitude.[241] Sulfate concentrations in surface water are far less variable.[242]

Due to the potential that dischargers could pre-test and select sampling dates and locations to provide the least stringent calculated sulfate standard, members of the Wild Rice Standards Study Advisory Committee asked MPCA at the February, 2017 meeting who would be doing the sampling to set "protective" sulfate standards. MPCA manager Shannon Lotthammer assured the Committee that the MPCA would be doing most of the sampling and that the scrutiny will be there.[243]

However, under the proposed rule, at least for new or expanding discharges, the discharger not the MPCA will be responsible for sediment sampling and analysis.[244] The MPCA acknowledges, "The process of selecting the sediment sample areas can be very complex in a natural setting . . The sampler must use best professional judgement (sic.) to select sample areas that accurately characterize the wild rice water."[245]

Where with millions of dollars at stake, the best professional judgment of a consultant hired by a discharger would be to select a sediment sample date and area to maximize the calculation of a high "protective" sulfate concentration. Sediment sampling by dischargers further reduces the likelihood that the MPCA's proposed sulfate equation would protect wild rice.

Avoiding the Sulfate Standard
In addition to the provisions described above each of which make potential application of the MPCA's proposed equation-based standard less stringent, the MPCA's proposed rules have three provisions to facilitate avoidance of the sulfate limit. Each is inconsistent with the Clean Water Act and biased against the protection of wild rice from sulfate pollution.

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[240] *See* discussion pages 24-25, *supra*.
[241] Roberts Memorandum 2017, *supra*, pp. 3-4 and Attachment 3.
[242] *See* discussion page 24, *supra*; MPCA, Which data set should we use? *supra,* Exhibit 46, p. 5.
[243] Commenter was present and took detailed notes at this February 15, 2017 meeting.
[244] MPCA proposed rule Minn. R. 7050.0224, Subp. 5, Item B (1)(c) and d (2) and Item E describe the sampling needed and incorporate by reference the Sampling and Analytical Methods for Wild Rice Waters. MPCA, SONAR, p. 84 describes discharger responsibility for sampling.
[245] *Id*., p. 86.

Minnesota's existing rules for water quality standards require proof that a modification of a water quality standard is "more appropriate than the statewide or ecoregion standard for a particular water body, reach, or segment" before a site-specific standard can be applied.[246] MPCA's proposed rule for its wild rice sulfate equation would permit a less stringent "alternative" standard without requiring compliance with Minnesota's existing rule.

The MPCA could establish an alternative *less stringent* sulfate standard any time data demonstrates that sulfide concentrations in pore water are 120 μg/L or less when surface water concentrations are at the calculated sulfate standard.[247] This less stringent standard would be applied based only on the assumptions in MPCA's formula, without any consideration of the condition of the wild rice.

MPCA explains that its "alternative" standard provision responds to "false positives" in its equation and would forego the requirements for establishing a site-specific standard. A site-specific standard "requires detailed analysis, public notice and comment, and EPA approval," but all of these activities "are beyond the analysis and approval associated with determining the protective sulfate numeric value when porewater sulfide is below the protective threshold proposed in this rulemaking."[248]

Although the MPCA states that its equation creates the same number of "false negatives" as false positives,[249] MPCA's proposed rule provides no "alternative" standard automatically making a sulfate limit *more stringent* whenever actual sulfide porewater exceeds 120 μg/L despite sulfate concentrations above the calculated "protective" level.

The MPCA's next rule provision to undermine the application of any effective limits on sulfate discharge allows the commissioner to apply a different level of proof to set a site-specific sulfate standard than that required for any other water quality standard. Rather than presuming that statewide equation limit applies, MPCA's proposed rule would allow application of a *less stringent* sulfate standard at a specific site if "the beneficial use is not harmed."[250] Even if there were clear agreement about what is meant by a current showing that wild rice "is not harmed" and even if adverse impacts on wild rice from sulfate pollution were always immediately evident – neither of which are true – this proposed rule would erode the application of water quality standards by shifting the burden of proof and requiring case-by-case demonstration of harm in order to limit pollution.

Unsurprisingly, MPCA's proposed rules contain no corresponding provision allowing the MPCA to set a *more stringent* sulfate standard any time the commissioner finds that wild rice is harmed by sulfate concentrations at or below the calculated "protective" sulfate limit.

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[246] Minn. R. 7050.0220, Subp. 7, adopted consistent with Clean Water Act regulations 40 C.F.R. §131.11(b)(1)(ii).
[247] MPCA proposed rule Minn. R. 7050.0224, Subp. 5, Item B (2).
[248] MPCA, SONAR, p. 90.
[249] *Id*., p. 79.
[250] MPCA proposed rule Minn. R. 7050.0224, Subp. 5, Item C.

Most troubling, MPCA's proposed rules say that if the MPCA determines that a polluter's effluent will not affect "wild rice beneficial use in the wild rice water" the commissioner "*must not establish a water-quality based effluent limitation*" for sulfate to protect wild rice.[251] This type of language in a water quality standard is unprecedented and unreasonable. In fact, it undermines the very concept of water quality standards to control polluted discharge.

The fundamental premise of the Clean Water Act is that states and authorized tribes must set and apply water quality standards to control effluent in order to protect the designated uses of water bodies.[252] A water quality standard, by its nature, resolves the question in law and in practice of whether effluent exceeding that standard will fail to protect a designated use. Although a discharger can challenge the reasonableness of its permit, the question of whether a standard is more protective than necessary is not open to challenge each time a discharger receives a pollution limit.

This is not an academic question. Throughout this rulemaking process and in hearings before the Administrative Law Judge, the Minnesota Chamber of Commerce and industrial dischargers have advocated to eliminate Minnesota's existing 10 mg/L wild rice sulfate standard and apply no other sulfate limit to discharge to protect wild rice.[253] MPCA's proposed rules would give dischargers unprecedented ability to weaken or entirely avoid the new wild rice sulfate standard. Such provisions are unreasonable, inconsistent with the State's authority under the Clean Water Act and arbitrarily and inappropriately biased against the protection of the designated use of waters for wild rice.

Implementation Intent

MPCA has not proposed rule language explicitly facilitating variances or delaying the implementation of its proposed wild rice sulfate standard. However, the text of the SONAR appears both to encourage variances and to reassure mining facilities that they need not be concerned about imposition of sulfate limits in the near future.

The MPCA's SONAR states that, although variances have not been common in the past, "this is likely to change." The SONAR then seems to predetermine the outcome of dischargers' applications for variances, stating "the MPCA recognizes that sulfate treatment is currently prohibitively expensive for many dischargers" and that industrial and municipal dischargers may apply for variances from the standard "until economically feasible treatment systems can be designed and constructed."[254] Although no evidence has yet been adduced, the MPCA seems to have already decided that treatment is prohibitive and not economically feasible.

For municipal dischargers, the MPCA appears poised to approve variances as a matter of routine. MPCA has promised a "streamlined application and review process," that individual applications "will not require the level of staff effort normally required for a variance review" and that little more information will be needed to finalize a variance decision since much of the information needed by MPCA to decide on these variances is "already known."[255]

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[251] MPCA proposed rule Minn. R. 7053.0406, Subp. 1 (emphasis added).
[252] *See e.g.* 33 U.S.C § 1251 *et seq.*; 33 U.S.C. §§1311(a), 1313(c), 1319(a), 1342(b); 40 C.F.R. §131.3.
[253] This position was clearly articulated in testimony in St. Paul on October 23, 2017.
[254] MPCA, SONAR, p. 107.
[255] *Id.*, at 109.

The MPCA has also sought to reassure mines and related facilities that the Agency is sympathetic to "the potential for costs incurred by any business to affect shareholders, employees, purchasers of the product, and local communities" and that actually limiting sulfate discharge will not happen soon: "Obtaining sediment data, calculating the standard, establishing effluent limits, reissuing permits, and all the activities associated with permit reissuance will require many years."[256]

The MPCA's biased and unprotective implementation rules and the intent expressed in documents supporting the proposed rule undermine the application of sulfate standards to control sulfate discharge. The following proposed rule provisions should all be rejected as unreasonable, unnecessary, inimical to protection and protection of wild rice designated uses, and outside the MPCA's delegated authority under the Clean Water Act:

Proposed rule **Minn. R. 7050.0130, Subp. 2a** (lines 1.6 to 1.10) and **Minn. R. 7053.0135, Subp. 2a** (lines 66.11-66.12) defining 365Q10 flow with once in ten-year recurrence to make sulfate standards less stringent due to an excessive calculation of dilution.

Proposed rule **Minn. R. 7050.0224, Subp. 5** (specifically lines 7.22 to 7.24, 8.13 to 8.14, 8.18 to 9.12) proposing a rule for exceedance that allows excessive pollution for more than a year, implementation methods biased against the protection of wild rice that make application of sulfate standards less stringent or prevent their application, and error-prone sampling of parameters by dischargers.

Proposed rule **Minn. R. 7053.0205, Subp. 7, Item E** (lines 66.22 to 67.2) applying a flow rate that makes sulfate standards less stringent and cross-referencing the rule that allows extended exceedances.

Proposed rule Minn**. R. 7053.0406, Subp. 1** (lines 67.6 to 67.10) biasing implementation against application of a sulfate water quality standard.

8) MPCA's proposal to remove protection of thousands of wild rice waters from material impairment or degradation as a result of factors other than sulfate pollution - such as hydrologic alteration - is baseless and inconsistent with the rule's history, its stated purpose, and the Clean Water Act.

Minnesota's existing wild rice water quality standard includes a narrative standard to protect wild rice and its aquatic habitat from impairment or degradation. On its face, this narrative standard applies to all Minnesota wild rice waters. MPCA's proposal to restrict protection of the wild rice narrative standard to only a very limited number of wild rice waters lacks any basis in technical or scientific data and analyses, is arbitrary, unreasonable, and inconsistent with the Clean Water Act, and would fail to protect the designated use of waters for wild rice under a number of man-made alterations.

[256] *Id.*, at 148. See also p. 118, "The process of sampling and calculating the applicable sulfate standard will be an ongoing process the MPCA expects to take many years to complete."

Under the Clean Water Act, water quality standards "consist of the designated uses of the navigable waters involved and the water quality criteria for such waters based upon such uses." 33 U.S.C. §1313(c)(2)(A). Water quality criteria may be "expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use." 40 CFR § 131.3(b). The Supreme Court explained in *PUD No. 1 of Jefferson County v. Washington Dep't of Ecology*, 511 U.S. 700, 715-716, 114 S. Ct. 1900 (1994), that both designations of the uses of water and "criteria," including those expressed in "broad, narrative terms," may be needed to protect a designated use.

The Court also explained that a sufficient alteration of water quantity could destroy all of its designated uses. Citing the Clean Water Act's "definition of pollution as "the man-made or man induced alteration of the chemical, physical, biological, and radiological integrity of water,"[257] the Court found that the Act was intended to protect both "the physical and biological integrity of water." *Id.*, 511 U.S. at 719.

Minnesota's existing wild rice standard states at Minnesota Rules 7050.0224, Subp. 1:

> The numeric and narrative water quality standards in this part prescribe the qualities or properties of the waters of the state that are necessary for the agriculture and wildlife designated public uses and benefits. Wild rice is an aquatic plant resource found in certain waters within the state. The harvest and use of grains from this plant serve as a food source for wildlife and humans. In recognition of the ecological importance of this resource, and in conjunction with Minnesota Indian tribes, selected wild rice waters have been specifically identified [WR] and listed in part 7050.0470, subpart 1. The quality of these waters and the aquatic habitat necessary to support the propagation and maintenance of wild rice plant species must not be materially impaired or degraded. If the standards in this part are exceeded in waters of the state that have the class 4 designation, it is considered indicative of a polluted condition which is actually or potentially deleterious, harmful, detrimental, or injurious with respect to the designated uses.

The MPCA's proposed changes to Minnesota's wild rice standard would remove reference to the ecological importance of wild rice and restrict to only 24 Minnesota wild rice waters the wild rice narrative standard preventing material impairment or degradation of the quality of waters and the aquatic habitat necessary to support the propagation and maintenance of wild rice plant species.[258]

Although MPCA suggests otherwise in its current SONAR,[259] the Agency's post-hearing comments in the 1997 wild rice standard rulemaking did not state that the new narrative standard was applicable only to 24 Minnesota wild rice waters. The MPCA explained that the narrative standard was needed due to declines of natural wild rice throughout the State, not in a handful of

[257] Citing 33 U.S.C. § 1362(19).
[258] MPCA proposed Minn. Rule 7050.0224, Subp. 1 deleting narrative standard and Minn. R. 7050.0224, Subp. 6 excluding most wild rice waters from amended narrative standard.
[259] MPCA, SONAR, pp. 30, 116.

listed waters and specifically referenced the threat posed by hydrologic modifications. This text is excerpted below:

> There is evidence demonstrating a decline in the number and aerial distribution of natural wild rice stands throughout the State of Minnesota. Some of these declines may be attributable to responses to: plant diseases; animal, fish or insect destruction; competition from other aquatic plants; and loss of suitable growing habitat due to the natural succession of the wild rice water bodies. In other instances, these declines may be attributed to human activities resulting from hydrologic modifications or water quality impacts that can affect the habitat conditions necessary for the continued maintenance of this plant species. The proposed amendments which specifically list 24 wild rice waters in Minn. R. 7050.0470 and the wild rice waters narrative standard in Minn. R. 7050.0224 are intended to provide a greater public awareness regarding the ecological importance of wild rice and create a regulatory basis to promote the study of the physical, chemical, and biological factors that are needed to maintain and enhance the continued propagation of this unique plant species.[260]

The MPCA's Technical Support Document also states that it is important to keep in mind that porewater sulfide is not the only environmental variable that affects wild rice. Additional factors, including reduced water transparency, elevated temperature and unfavorable hydrology are also associated with the absence of wild rice.[261]

The wild rice narrative standard may be needed to protect wild rice waters from dams or discharge that flood wild rice beds, thermal pollution that increases water temperature, or nutrients that result in chemical changes that reduce transparency. MPCA's proposed rule change to restrict the wild rice narrative standard to 24 waters would fail to protect wild rice designated use in many other Minnesota wild rice waters that may be threatened by anthropogenic actions other than sulfate discharge. MPCA has provided no technical or scientific justification to restrict application of the narrative standard that protects wild rice.

Proposed rule provisions restricting to only 24 waters the narrative standards protecting wild rice from degradation and impairment are arbitrary, capricious, unsupported by an appropriate basis and inconsistent with the Clean Water Act and should be rejected:

> Proposed deletion of **Minn. R. 7050.0224, Subp. 1** (lines 6.8 to 6.14) and proposed rule at **Minn. R. 7050.0224, Subp. 6** (lines 9.13 to 9.18) arbitrarily excluding most wild rice waters so that they would not be protected from material impairment or degradation.

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[260] *In the Matter of Proposed Amendments to Rules Governing Water Quality Standards, Minn. R. ch. 7050, and Proposed New Rules Governing Water Quality Standards, Standard Implementation, and Nondegradation Standards for Great Lakes Initiative Pollutants in the Lake Superior Basin, Minn. R. ch. 7052,* MPCA Staff Initial Post-Hearing Response Excerpts, Oct. 14, 1997, Exhibit 78.
[261] MPCA, TSD, p. 39.

9) MPCA's failure to evaluate the impact of its proposed rules on eutrophication, aquatic life, methylmercury contamination of fish, and degradation of Treaty resources within tribal Ceded Territories, as compared to enforcement of Minnesota's existing rule is unreasonable, arbitrary, and inconsistent with the Clean Water Act.

If the MPCA were proposing a new water quality standard to protect wild rice by limiting sulfate pollution, the Agency might choose to examine the benefits of new sulfate pollution control to other designated uses of waters, but this analysis would not be required.

However, Minnesota has an existing water quality standard limiting sulfate to 10 mg/L in waters where wild rice is present. The EPA has instructed and the MPCA has repeatedly acknowledged that Minnesota is required to enforce its existing 10 mg/L wild rice sulfate standard under the Clean Water Act.[262] In fact, Minnesota's ability to maintain its legal authority to issue water pollution discharge permits, rather than have dischargers subject to federal control, is contingent on the state's compliance with its Clean Water Act delegated duties and responsibilities.[263]

The record is clear that MPCA's failure to enforce the existing rule is not due to any lack of understanding of the rule's requirements, but rather due to the extraordinary political pressure brought upon the regulatory agency, culminating in legislation actually precluding the MPCA's application of its existing wild rice rule.[264]It is unreasonable, arbitrary and inconsistent with the Clean Water Act for the MPCA to fail to evaluate the effects of its proposed rule as compared with enforcement of Minnesota's existing wild rice sulfate standard of 10 mg/L.

The MPCA's proposed rule would permit elevated sulfate concentrations in waters where sulfate dischargers would otherwise be required to control sulfate to comply with Minnesota's existing 10 mg/L wild rice sulfate standard. In addition to the effects of such elevated sulfate concentrations on wild rice discussed in previous Sections of these comments, elevated sulfate levels have the potential to increase eutrophication of lakes, mortality of aquatic life, and methylmercury contamination of fish, with resulting neurotoxicity to human beings as well as wildlife that eat contaminated fish.

Each of these adverse effects of elevated sulfate has the potential to have a disproportionate effect on low income rural communities and tribal members who rely on wild rice and fish for subsistence and in tribal Ceded Territories, where the existing wild rice sulfate standard, if appropriately enforced, would protect water quality and Treaty resources.

MPCA's failure to analyze each of these potential adverse effects of its proposed rule change is unreasonable and inconsistent with the Clean Water Act and the Agency's own policies.

The MPCA does not dispute that additions of sulfate to water bodies increases sulfide production, resulting in increased release of phosphorus from sediments both as a result of a chemical reaction of sulfide with iron in the sediments and as a result of increased decomposition

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[262] *See* comment discussion, *supra*, and Exhibits 5, 10, 11, 12, 15, 16, 18, 19, 120A, 20B, 20C, *supra*.
[263] *See* 33 U.S.C. §§ 1319(a)(2) and 1342(c)(3); 40 C.F.R. §§123.63, 123.64; WaterLegacy Petition for Withdrawal of Authority, *supra*, Exhibit 15 and Exhibits to the Petition, provided in Exhibit 16, *supra*.
[264] See comment discussion, *supra*, and Exhibits 14, 15, 16, *supra*.

of organic matter.[265] Dr. M. Siobhan Fennessy, an environmental scientist on the MPCA's Peer Review Panel, explained that increased sulfate and sulfate reduction to sulfide results in decomposition of organic matter and increased availability of nutrients such as nitrogen and phosphorus. Dr. Fennessy cautioned that "the focus on sulfide and iron to the exclusion of other sediment compounds oversimplifies the chemistry of these systems."[266]

The impact of increased eutrophication on water quality and aquatic life is summarized in Minnesota rules adopted in an attempt to control nutrient loading from anthropogenic sources:

> "Eutrophication" means the increased productivity of the biological community in water bodies in response to increased nutrient loading. Eutrophication is characterized by increased growth and abundance of algae and other aquatic plants, reduced water transparency, reduction or loss of dissolved oxygen, and other chemical and biological changes. The acceleration of eutrophication due to excess nutrient loading from human sources and activities, called cultural eutrophication, causes a degradation of water quality and possible loss of beneficial uses.[267]

Scientific research has also demonstrated that some aquatic insects upon which the aquatic food chain depends are vulnerable to impacts to sulfate. According to the MPCA, the lowest level at which it has been determined that sulfate may become toxic is 75 mg/L in soft-water conditions. The next most protective sulfate toxicity benchmark used by other jurisdictions is 124 mg/L, which is applied more generally to ambient water conditions.[268] In Northern Minnesota's St. Louis River watershed, the highest sulfate concentrations "are observed in small streams in the immediate vicinity of mining features."[269] Sulfate concentrations from several streams with impairments of biological integrity have exceeded 124 mg/L in at least one sample.[270]

In addition to the effects of sulfate alone, combinations of salts, including sulfate, that result in ionic concentrations above natural background levels can kill sensitive aquatic insects.[271] The MPCA has stated that the EPA benchmark (300 uS/cm) for conductivity should be considered to develop a standard to protect aquatic life in Minnesota streams and has documented locations in the St. Louis River Watershed where conductivity is elevated to the point it threatens aquatic life.[272] Excessive sulfate and/or elevated conductivity in mining-impacted streams (Spring Mine Creek, Wyman Creek) has been identified as a potential stressor resulting in low fish counts and limited aquatic diversity.[273]

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[265] MPCA, TSD, pp. 11, 99.
[266] MPCA Peer Review Panel Summary Report Excerpts, *supra*, Exhibit 38, autop. 6.
[267] Minn. R. 7050.0150, Subp. 4, Item L.
[268] MPCA, St. Louis River Watershed Stressor Identification Report, Dec. 2016 Excerpts, p. 39-40, autop. 11-12, Exhibit 79.
[269] *Id*., p. 37, autop. 9.
[270] *Id*., p. 40, autop. 12.
[271] See U.S. EPA, A Field-Based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams, (Final Report), EPA/600/R-10/023F, 2011, available at https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=233809
[272] MPCA, St. Louis River Watershed Stressor Identification Report, *supra*, Exhibit 79, pp. 33, 35; autop. 5, 7.
[273] *Id*., pp. 22, 35, 40, 286-288, 299-311; autop. 3, 7, 12, 35-37, 48- 60. For Wyman Creek, iron concentrations over five times higher than EPA's aquatic life standard of 1,000 µg/L were also cited as a potential stressor for aquatic life. *Id*., p. 268-269; autop. 17-18.

Finally, research has established that increased sulfide production resulting from sulfate loading can increase the conversion of inorganic mercury to methylmercury, the form of mercury that bioaccumulates in fish. Increased production of methylmercury is a significant concern, given that bioaccumulation of methylmercury in fish is a major cause of water quality impairments in Minnesota .[274]

The harmful effects of methylmercury contamination of fish are well-known. Dr. Margaret Saracino, a Duluth child and adolescent psychiatrist has explained the particular vulnerability of fetuses, infants and children to morbidity resulting from methylmercury exposure:

> When pregnant women eat fish high in methylmercury, the fetus is then exposed to this lipophilic heavy metal. The placenta is not protective and the blood brain barrier is not well formed until after age two years, which makes fetuses, infants and young children most vulnerable to methylmercury's neurotoxic effects. Neurons in the developing brain multiply at a rapid rate and are particularly vulnerable to toxic effects of heavy metals, hence brain damage is more likely to occur during this vulnerable time. Neurotoxicity is also transferred to the infant through breast milk.
>
> The adverse effects of methylmercury depend on timing and amount of exposure. Methylmercury is a strong toxin that influences enzymes, cell membrane function, causes oxidative stress, lipid peroxidation and mitochondria dysfunction, affects amino acid transport and cellular migration in the developing brain. Exposure in utero can cause motor disturbances, impaired vision, dysesthesia, and tremors. Even lower level exposure can result in lower intelligence, poor concentration, poor memory, speech and language disorders, and decrease in visual spatial skills in children exposed to methylmercury in utero. Fetuses, infants, and young children are four to five times more sensitive to the adverse effects of methylmercury exposure than adults.[275]

Research performed by Amy Myrbo, Ph.D., in connection with Dr. Pastor's experimental mesocosms has demonstrated that increased sulfide production resulting from sulfate loading both increases release of inorganic mercury from sediment into the water and increases the proportion of mercury that is converted to toxic methylmercury.[276] Dr. Myrbo found that in mesocosms with sulfate loading of either 100 mg/L or 300 mg/L, methylmercury increased 5.9 times as compared to the control experiment where no sulfate was added.[277] Sulfate loading also increased release of inorganic mercury from sediments to the water, with a maximum increase at sulfate loading of 300 mg/L of 2.2 times over the experimental control.[278]

It has long been suggested that that there is a "sweet spot" where sulfate and sulfide concentrations are optimal for mercury methylation. Dr. Myrbo concluded that there is substantial evidence that sulfide levels above concentrations of 300-3000 µg/L have an inhibitory effect on mercury methylation.[279] The levels of sulfate loading observed in mesocosms and the

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[274] MPCA, TSD, pp. 99-100.
[275] M. Saracino, Summary Opinion regarding Morbidity Associated with Methylmercury Exposure and other Neurotoxic Chemicals Potentially Released by the PolyMet NorthMet Copper-nickel Mine Project, Dec. 7, 2015, p. 2, Exhibit 80.
[276] Myrbo, et al., Increase in nutrients, mercury, and methylmercury as a consequence of elevated sulfate reduction to sulfide in experimental wetland mesocosms (2017*), J. Geophys. Research: Biogeosciences*, 122, Exhibit 81.
[277] *Id*., Table 1, autop. 25.
[278] *Id*.
[279] *Id*., autop. 4.

MPCA's proposed sulfide threshold of 120 µg/L are well within the sweet spot where increased sulfate loading would increase mercury methylation.

An example of potential mercury contamination effects of MPCA's proposed rescission of Minnesota's current 10 mg/L sulfate limit in favor of an equation is provided where the St. Louis River meets Lake Superior. Many reaches of the St. Louis River are impaired due to mercury in fish tissue and/or mercury in the water column.[280] MPCA research shows that walleye fish tissue in the lower St. Louis River, in particular, has significantly higher mercury concentrations than other walleye in the region.[281]

MPCA's calculated "protective" sulfate levels from applying its formula to field survey data for the St. Louis Estuary range from 95.5 mg/L to 241.1 mg/L,[282] levels that are not only up to 24 times higher than Minnesota's 10 mg/L sulfate standard but are also up to 24 times higher than actual sulfate standards in these waters.[283] According to Dr. Myrbo's recent paper, these calculated allowable sulfate concentrations and the sulfide threshold they are based on would be in the sweet spot for maximum conversion of mercury to toxic methylmercury.

In addition to impacts on wild rice presence and abundance,[284] increased sulfate loading under the MPCA's proposed rules would impact nutrients and eutrophication, aquatic ecosystems that support fish, and methylmercury contamination of fish in wild rice waters. These impacts would fall disproportionately on low-income citizens in Northern Minnesota who depend on wild rice and fish for subsistence.

Due to the geographic distribution of Minnesota's remaining wild rice waters - where the existing 10 mg/L sulfate limit would apply absent the proposed rule change - these adverse environmental and health impacts would also fall disproportionately on indigenous people whose culture and subsistence depend on the ability to harvest wild rice and fish. Although the MPCA mapped reservations as "Native American Lands,"[285] the Agency did not analyze the impacts of increased sulfate discharge on tribal Ceded Territories or Treaty resources. A map superimposing Ojibwe/Chippewa Ceded Territories and lands appropriated from or ceded by Dakota peoples is attached with these comments.[286]

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[280] MPCA, Draft 2018 Minnesota Impaired Waters List Excerpt (St. Louis River), Exhibit 82. Complete Draft Impaired Waters List available at https://www.pca.state.mn.us/water/minnesotas-impaired-waters-list

[281] MPCA (B. Monson), St. Louis River Fish Mercury, Feb. 10, 2012, p. 4, Exhibit 83.

[282] *See* MPCA, Field Survey Data with CPSC (sorted by water body), *supra*, Attachment G to Pastor Technical Review 2017, (sites S007-444, S007-206, S006-928).

[283] See Attachment 2 (Field Data CPSC and Actual Sulfate Ratios) to Roberts Memorandum 2017, *supra*, at row 45, St. Louis Estuary Pokegama Bay. Although MPCA's proposed rule would not classify the St. Louis River Estuary Pokegama Bay site (S006-928) as a wild rice water, MPCA Spreadsheet WR Dev Oct. 10, 2017, *supra*, Exhibit 59, there is field sampling evidence of wild rice in Pokegama Bay. See PolyMet 2009 and 2010 Wild Rice Reports, *supra*, Exhibit 73, autop. 10, 19.

[284] Since increased sulfate loading also reduced seed weight and viability in experimental mesocosms, Pastor Technical Review 2017, *supra*, p. 4, it is also possible that sulfate loading affects wild rice nutrition.

[285] MPCA's assertion with respect to proposed waters that are wholly or partially within a federally recognized Indian reservation, that "MPCA has the authority to identify and list wild rice waters as 4D waters to which the standard applies for all waters of the state, which includes waters within Indian reservations," SONAR, p. 52, seems to reflect a misunderstanding of law. See 33 U.S.C. §1377(e); 40 C.F.R. §131.7.

[286] Map, Anishinaabeg Ceded Territories and Dakota Ceded and Congressionally appropriated lands superimposed on MPCA Figure 7 map from page 139 of the SONAR, Exhibit 84.

It is unreasonable for the MPCA to propose to change the wild rice sulfate standard without analyzing the potential harms of eutrophication, decline in aquatic life diversity, and methylmercury contamination of fish resulting from sulfate concentrations above 10 mg/L in waters where wild rice is present and waters downstream of wild rice waters. These harms could be prevented or ameliorated if Minnesota's existing wild rice sulfate standard were enforced.

It is also unreasonable for the MPCA to dismiss environmental justice concerns[287] without comparing the proposed rule to enforcement of Minnesota's existing 10 mg/L sulfate limit, and without evaluating impacts of the changed rule on eutrophication, fish diversity and abundance and human health consequences of mercury contamination of fish to persons who rely on wild rice and fish for subsistence, particularly Native American people who depend on resources in Ceded Territories. The MPCA is obligated, under its own policy, to prevent such disproportionate negative environmental consequences.[288]

For the reasons stated in this Section, all of the MPCA's proposed rules previously identified in these comments are unreasonable, arbitrary, and inconsistent with MPCA's authority under the Clean Water Act and the Agency's own policies and should be rejected.

CONCLUSION

The MPCA's proposed rulemaking to change Minnesota's wild rice sulfate standard was initiated by the Minnesota Chamber of Commerce to protect its members - mining and other industrial dischargers - from the costs of controlling sulfate discharge. Political pressure from these dischargers and Iron Range politicians has prevented enforcement of Minnesota's existing sulfate standard and has tainted the process of developing the standard itself. The MPCA's SONAR for the proposed rules describe in detail mining facility sulfate discharge and potential challenges and costs to the mining industry if control of sulfate discharge were to be required.[289]

Neither the Clean Water Act nor the MPCA's stated purpose for this rulemaking allow these powerful interests to guide decisions on whether the proposed rules are needed, reasonable and within the scope of Minnesota's delegated authority under the Clean Water Act. The proposed rules must be judged on whether the rescission of the current numeric wild rice sulfate criterion; the adoption of a flawed equation that allows elevated sulfate where there are high levels of sediment iron; the revision of the designated use of waters to exclude thousands of waters where wild rice is an existing use; the use of implementation methods that bias against the protection of wild rice; and the restriction of a narrative criterion to protect wild rice from material impairment to only 24 waters in the state serves to protect Minnesota's wild rice. These are questions of chemistry, biology, population ecology, federal as well as state law and, ultimately of values.

The Minnesota Chippewa Tribe and the Minnesota Indian Affairs Council have emphasized, for both the Ojibwe and Dakota people wild rice "is the preeminent cultural resource of this region

[287] MPCA, SONAR, pp. 135-136.
[288] MPCA, Policy: Incorporating Environmental Justice Principles and Practices (EJ Policy) into Minnesota Pollution Control Agency Operations, Oct. 11, 2012, Exhibit 85.
[289] MPCA, SONAR, pp. 173-176, 184,

and central to our cultural heritage."[290] A technical advisor to the MPCA's Standards Study process has stated, "More than almost any other form of life in Minnesota afforded some protective measures by the State, its Zizania palustris variety palustris [wild rice] has national significance." Thus, "The State has a wider-than-usual responsibility here that must be addressed when considering revision of the sulfate standard."[291]

Elevated sulfate discharge threatens wild rice, increases eutrophication of lakes, impairs aquatic life, increases methylmercury contamination of fish – affecting human health, and disproportionately impacts low-income people and tribal communities. To protect all of these important values and designated uses of waters, it is time for Minnesota regulators not only to enforce Minnesota's existing wild rice sulfate standard but to determine what other water quality criteria for sulfate and other salts and ions are needed to more broadly protect aquatic life, fish and human health.

Based on the detailed arguments made in our preceding comments, the expert opinions and exhibits submitted with these comments, applicable science and law, WaterLegacy respectfully requests that each of the specific proposed rule provisions highlighted in our comments in the introduction to these pages[292] and in each individual Section be rejected on the grounds that it is unnecessary, arbitrary, capricious and unreasonable, and exceeds the MPCA's delegated authority under the Clean Water Act.

Rejection of these proposed rule provisions would provide clarity to control sulfate pollution of wild rice waters and most effectively protect wild rice.

Respectfully submitted,

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[290] Minnesota Chippewa Tribe letter to MPCA, *supra*, Exhibit 32, p. 1; Minnesota Indian Affairs Council letter to MPCA, *supra*, Exhibit 33, p. 1.
[291] Schimpf Comments 2015, *supra*, Exhibit 21, pp. 11-12.
[292] Pages 3-4 of these comments.