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See attached file with my comments

Review: 2023 Proposed MPCA Framework for evaluating site specific sulfate standards to protect wild rice

In summary, the framework for site specific standards (SSS) for wild rice waters would offer a deviation from the Minnesota standard for sulfate, a wa to allow sulfate standards and associated pollution higher than the current 10 parts per million (10ppm), and a way to avoid limiting sulfate discharge for individual sites using just about any approach as justification.

While the introductory section describes beneficial use in broad terms (production, biomass) and recognizes tribal interests and uses, and while apparently MN statutes allow for setting SSS, the proposed implementation of setting SSS is open-ended and seems not to recognize these principles of beneficial use. The proposed framework will not protect wild rice.

Determining the sulfate "effects threshold" is particularly concerning, as extensive research has shown that the current 10ppm standard is, in fact, the effects threshold.

MPCA's concept that sulfate discharge limits will not consider degradation but rather capacity to absorb pollution, will mean that a permit would allow sulfate discharge much higher than the sulfate standard if the wild rice waters downstream have a low sulfate concentration…an example is Big Sandy Lake with an average sulfate concentration of 1.2mg/l, which would ostensibly allow loading from the proposed Talon Metals to degrade the lake for wild rice and cause a huge increase in mercury in fish tissue and risk to human health.

The approaches in the framework suggest either setting the current sulfate standard or taking "novel approaches" which are not defined.

All the suggested "novel" approaches seem to open the door to justify sulfate loading into wild rice waters far above the current standard, in ways that are not supported by scientific evidence or knowledge. Where the document really breaks down is the section on demonstration of wild rice health using "experimental endeavors", which completely ignores the research and demonstrations by Minnesota scientists (Paster, Johnson, Myrbo and others…which are cited in the literature section). The two examples of historical data (Mississippi River and Perch Lake) are puzzling as they show in the first case that wild rice stands in backwaters likely have not been measured for sulfate, but nearby river channels have high amounts of sulfate. In the second case, sulfate caused a decline in wild rice. These examples offer nothing in terms of examples for this framework.

The last section on documenting ambient sulfate in regional waters seems irrelevant to the topic of SSS in wild rice waters. Figures show that sulfate is higher in samples from various waterbodies in SW Minnesota without connecting those data to any wild rice waters that may have been sampled. An examination of the MPCA map of wild rice waters shows that only a small handful of wild rice waters are located on the boundary between high and low sulfate waters in the state…the vast majority of wild rice waters in MN are located where sulfate levels

are generally far less than 10mg/l. There was no attempt to demonstrate how regional waters could effectively be used to predict wild rice beneficial use in an SSS.

In general, this document seems slapped together, poorly developed and lacks logic. The framework begins by setting a goal of protecting wild rice but then degenerates to a jumble of unjustified and open-ended approaches. It is also beyond belief that two mining companies applied in August 2023 for site specific standards; it would appear that this framework has been slapped together to accommodate private needs to exceed the current sulfate standard….

I recommend the following for this framework:

- **Must enforce standard.** MPCA must enforce Minnesota's wild rice sulfate standard of 10 parts per million under the Clean Water Act and decisions of the Minnesota courts. MPCA has no discretion to continue to delay or deny enforcement. 10ppm sulfate is the "effects threshold" for wild rice degradation.

- **Degradation prohibited**. Both the Clean Water Act and Minnesota law prohibit degradation of water quality in Minnesota lakes, streams, and wetlands. MPCA must not allow polluters to degrade high quality, low-sulfate wild rice waters. MPCA must not allow pollution discharge into known and listed degraded waters.

- **Protect low-sulfate waters**. Many of Minnesota's most abundant wild rice stands in the Boundary Waters, the Lake Superior watershed, and north central Minnesota (including the Big Sandy Lake area) have far less than10 parts per million of sulfate. MPCA permitting should not allow sulfate in these wild rice waters to increase at all, even to just below the standard.

- **Sulfate and mercury**. Sulfate pollution increases toxic mercury contamination of fish due to release mercury from sediments and increased mercury methylation. MPCA must consider the effects of lax sulfate standard enforcement on mercury and methylmercury.

- **Health threat of sulfate and mercury**. MPCA lax enforcement of the wild rice sulfate standard and increased mercury contamination of fish will damage the developing brains of fetuses, infants, children, and people who rely on fish for subsistence, and will impair the exercise of tribal Treaty-reserved rights.

- **Need proof to consider "site-specific standard."** The wild rice sulfate standard is not advisory. Any discharger asking for MPCA even to consider of a "site-specific standard" sulfate standard must prove that wild rice beneficial use will be protected long-term.

- **High iron does not protect wild rice.** Peer-reviewed scientific evidence does not support allowing more sulfate when there is also a high level of iron in sediments. Adding sulfate to waterbodies with high levels of iron coats wild rice roots with iron sulfide and interferes with wild rice seed quality, production and sustainability of this important annual plant.

- **MPCA's "equation" is not valid science.** MPCA's "equation" method to determine if wild rice production would be protected without the 10 parts per million standard was debunked in contested case proceedings in 2018. The "site-specific standards" loophole should not be used to resurrect this scientifically unsupported theory.

- **Current discharge – historic proof**. Before a "site-specific standard" can be considered for wild rice waters that currently exceed the wild rice sulfate discharger, the proponent (discharger or MPCA) must prove based on independent research—from the time historic sulfate discharge began to the present—the absence of harm to wild rice beneficial use, including harm to density, productivity, genetic diversity, and nutritional quality.

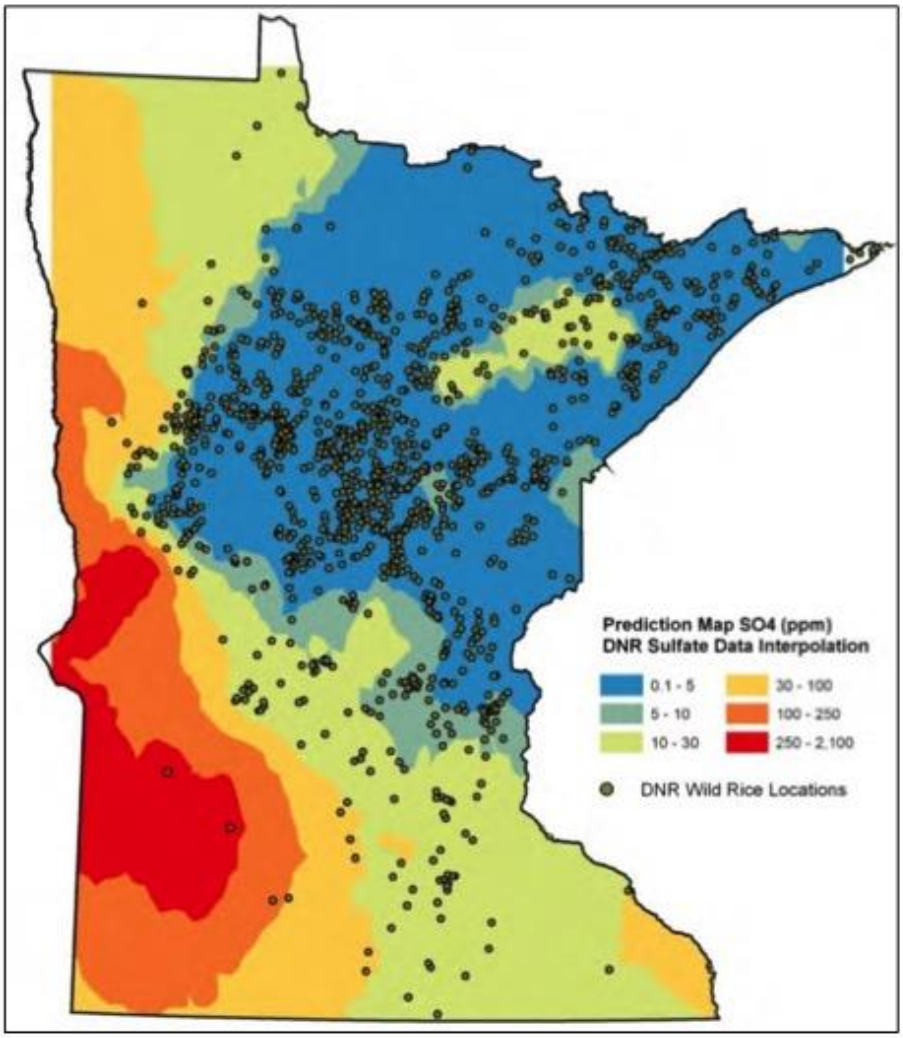
- **New or expanded discharge – long-term research**. Before a "site-specific standard" can be considered for a new or expanding discharge to wild rice waters, the proponent (discharger or MPCA) must prove based on at least 5 years of independent research using site-specific wild rice seeds and sediment that the proposed sulfate levels would not cause harm to wild rice beneficial use, including harm to density, productivity, genetic diversity, and nutritional quality

- **Tribal and public process.** No "site-specific standard" for discharge of sulfate to wild rice should be approved by MPCA without tribal consultation and tribal consent, and a formal and public rulemaking process.

- **Enforcement without further delay**. Unless and until a more? stringent "site-specific standard" is formally approved as required under state law and the Clean Water Act, the MPCA must apply the 10 parts per million wild rice sulfate standard in setting and enforcing permit limits and in preparing TMDL studies and implementation plans to restore wild rice waters listed as impaired due to excessive sulfate.

Supporting our recommendation are the following illustrations:

Wild Rice Locations and Sulfate Concentrations Map (MPCA & DNR Data)



Scientific Research Image from S. LaFond-Hudson, Iron sulfide formation on root surfaces controlled by the life cycle of wild rice, Biogeochem. (2018)

Fig. 2 Sulfate-amended (left) and unamended (right) roots.

Abstract: “We exposed a model annual wetland plant, Zizania palustris [wild rice], to elevated sulfate concentrations (3.1 mM) and quantified the development of iron oxide and iron sulfide precipitates on root surfaces throughout the plant life cycle. During the onset of seed production, root surfaces amended with sulfate transitioned within 1 week from iron (hydr)oxide plaques to iron sulfide plaques . . . Sulfate-amended plants produced fewer and lighter seeds with less nitrogen than unamended plants.”

In summary, this framework goes against the MPCA mission and purpose:

“The Minnesota Pollution Control Agency is committed to ensuring that every Minnesotan has healthy air, sustainable lands, clean water, and a better climate.

Through the authority of state and federal statutes and guidelines, the state agency focuses on preventing and reducing the pollution of air, land, and water, and leads Minnesota's efforts to protect against the devastating effects of climate change. We work with regulated parties, businesses, governments, organizations, and Minnesota's 11 tribal nations to develop innovative, community-centered approaches that protect our natural resources, improve human health, and foster strong economic growth.

The MPCA addresses statewide inequities in pollution exposure through its work to ensure that Black, Indigenous, communities of color, and low-income residents enjoy a healthy environment and fair treatment with respect to the development, adoption, and enforcement of environmental laws, regulations, and policies. The agency advances meaningful engagement with communities most impacted by pollution and programs intended to protect against it."

I urge the MPCA to remember its purpose and mission to protect our waters, especially including our wild rice waters and wild rice heritage and protect human health and wellbeing from sulfate and other pollution, by enforcing the current 10ppm wild rice sulfate standard. I especially encourage the MPCA to listen to our Tribal leaders and experts, as they depend on wild rice for community heath, culture and other benefits.