

February 14, 2024

VIA EMAIL

Chrissy Bartovich  
U.S. Steel Corporation  
Minnesota Ore Operations  
PO Box 417  
Mountain Iron, MN 55768

RE: Application for a Sulfate Site-Specific Standard for Hay Lake (AUID 31-0037-00), located downstream of the U.S. Steel – Keetac (Keetac)

Dear Chrissy Bartovich:

The Minnesota Pollution Control Agency (MPCA) received United States Steel Corporation's (U.S. Steel) application for a sulfate site-specific standard (SSS) for Hay Lake, dated August 17, 2022. This request seeks to modify the applicable Class 4A sulfate water quality standard for the protection of wild rice in Hay Lake from the statewide 10 milligrams per liter (mg/L) standard to a site-specific standard of 79 mg/L.

The MPCA reviewed the application for conformity with applicable regulations, scientific defensibility, and appropriateness for the site-specific context of Hay Lake. The application fulfills the required site-specific standard submission process but does not contain sufficient information to justify a modification to the existing wild rice standard. Therefore, the MPCA denies the sulfate site-specific standard request and has determined that the application is not suitable for approval and submission to U.S. Environmental Protection Agency (EPA) for final review.

Consistent with federal regulations (40 C.F.R. § 131.11) and state rules (Minn. R. 7050.0220, subp. 7), the application is insufficient because it does not demonstrate that the wild rice beneficial use will be protected at the proposed sulfate standard, the method used to derive the sulfate standard is not scientifically defensible, and the proposed sulfate standard is not demonstrated to be more appropriate than the currently applicable statewide standard.

During a conference call with U.S. Steel on November 27, 2023, MPCA shared its decision and feedback regarding the company's SSS application for Hay Lake. The following written comments provide more information about the MPCA's review of the Hay Lake SSS application and the basis for the Agency decision to deny the SSS request. The issues outlined below address broad themes and do not represent a comprehensive listing of MPCA's concerns on all aspects of the application. If U.S. Steel chooses to continue to pursue a SSS for Hay Lake, working to resolve these issues will be foundational in developing a sound application.

**Issue 1: Insufficient data are presented to demonstrate the beneficial use is protected (40 C.F.R. § 131.11(a)(1)).**

Applications for a SSS must demonstrate that the proposed numeric standard will protect the beneficial use. For a SSS request from the Class 4A sulfate water quality standard for waters used for production of wild rice (Minn. R. 7050.0224, subp. 2.), the applicant must articulate how the proposed standard will protect the wild rice beneficial use. This requires a demonstration that the waterbody will maintain a wild rice population that is productive, meaning the proposed sulfate standard allows for the continued generation of wild rice biomass into the future.

An approach recognized by the MPCA to make this demonstration is to apply the current ambient sulfate concentration as the proposed standard, if and only if the wild rice population is shown to be “productive” over the long-term and is not trending towards local extirpation. This method would need to include long-term data collection on wild rice population metrics, such as abundance and density, that yield valuable insight into productivity trends and potential boom-bust cycles in the waterbody of interest. The presence of any amount of wild rice in sporadic years does not, in and of itself, constitute sufficient evidence of a long-term, self-sustaining wild rice population.

U.S. Steel’s SSS application does not include sufficient information to demonstrate that the wild rice beneficial use is met, or will be met, in Hay Lake at the proposed numeric sulfate value. The wild rice population monitoring data from field surveys spanning 2009-2012, 2014, and 2021, are discontinuous and do not show a clear and consistent picture of wild rice health in Hay Lake (see section 3.2 of the application). The data from 2009-2012 and 2014 show varying degrees of spatial extent, density, and water levels, as expected given known annual variability in wild rice’s population growth. However, the most recent year of data, 2021, documents no wild rice after July. U.S. Steel acknowledges that hydrologic changes from documented upstream beaver activity is a contributing factor to the observed variable wild rice abundance, especially the years with low or absent wild rice. The limited extent of provided data and analysis are not sufficient to enable MPCA to identify a possible population trend or to ascertain whether such variations, especially the years of sparse or absent wild rice, are primarily due to natural cyclicity or anthropogenic causes.

U.S. Steel asserts that the presence of wild rice over a decade ago is evidence enough that the wild rice population is productive and that the beneficial use is met. However, providing historical documentation of wild rice presence and articulating a general expectation that it will be present into the future does not, by itself, establish that the beneficial use is protected. Further reflection on the condition and robustness (level of production and resilience of the population) of wild rice in Hay Lake is necessary to demonstrate that the beneficial use is protected.

Given the wild rice data provided in the application, MPCA is unable to determine with certainty that the wild rice beneficial use is currently being met. Further, because the application does not demonstrate that the wild rice beneficial use is currently met in Hay Lake, it is not possible to demonstrate that U.S. Steel’s proposed sulfate standard will protect the beneficial use in the future.

**Issue 2: Proposed sulfate standard derivation method must be scientifically defensible (40 C.F.R. § 131.11(b)(1)(iii)).**

In the Hay Lake SSS application, U.S. Steel derives a sulfate standard of 79 mg/L that relies exclusively on the sediment-based equation from MPCA's 2018 rulemaking effort to revise the sulfate water quality standard for waters used for production of wild rice. However, the equation output is a prediction, based on geochemical relationships, of the sulfate concentration at which wild rice is likely protected from harm due to elevated sulfate and the associated accumulation of sulfide in the sediment porewaters, but it neither reflects any on-site biological observations nor considers the long-term ecological production of the waterbody's wild rice population. Thus, MPCA does not support the use of this equation as the primary means to determine the proposed sulfate standard because it does not directly link to a demonstration of wild rice health and therefore cannot show beneficial use attainment (40 C.F.R § 131.11(a)(1)). Additionally, the use of the sediment-based equation may return sulfate concentration values that are thought to be generally unsupportive of wild rice, at least in some environments, as evidenced by growth experiments in mesocosms, and recent concerns have emerged that suggest the degree of protection against sulfide that is afforded by iron may not be as great as originally conceived.

Further, the Hay Lake SSS application does not include consideration of recent publications and updated scientific understanding of wild rice ecology. An applicant for a sulfate SSS should engage with the current state of wild rice science, reflect upon important recent scientific literature and reports, and identify whether their efforts are consistent with current knowledge about wild rice and suggested approaches to analyzing population robustness. This effort is necessary to establish a proposed standard that is derived through scientifically defensible methods and is scientifically sound itself. A list of important references (not exhaustive) is included as an attachment to this letter.

The derivation and analysis of the proposed sulfate SSS exclusively focuses on defining the magnitude (79 mg/L). The Hay Lake SSS application does not consider or mention the duration and frequency of the SSS, which are required elements of a water quality standard.

Lastly, the Hay Lake SSS application does not provide other lines of evidence to indicate that the proposed sulfate value will be protective of wild rice.

For these reasons, MPCA finds the method used to derive the proposed site-specific sulfate standard for Hay Lake to be scientifically indefensible.

**Issue 3: Proposed sulfate standard must be demonstrated to be more appropriate than currently applicable standard (Minn. R. 7050.0220, subp. 7).**

Minn. R. 7050.0220, subp. 7, authorizes the MPCA to approve a SSS where specific conditions in a waterbody indicate that a site-specific water quality standard is "more appropriate" than the currently applicable statewide standard.

The application should explain why a modified standard is more appropriate than the statewide standard. As submitted, the Hay Lake SSS application lacks adequate description and analysis on the matter of whether conditions in Hay Lake are unique and justify the application of a site-specific modification of the sulfate standard, i.e., what exceptional circumstances would allow wild rice to thrive and the beneficial use to be protected under a less stringent standard at this location.

**Other comments:**

1. The application does not include a review of all relevant historical data and information covering Hay Lake's wild rice population and sulfate concentrations. Meaningful reflection on how sulfate concentrations have changed in concert with wild rice would provide valuable background knowledge and is also critical in understanding the context of the current variations in sulfate concentrations and wild rice productivity.
2. The application should not seek to influence how effluent limits for the Keetac tailings basin would be determined. The MPCA requests that any subsequent site-specific standard application not contain any effluent limit determination for National Pollutant Discharge Elimination System/ State Discharge System (NPDES/SDS) permit holders, as it is outside the scope of a water quality standard action. It is the MPCA's responsibility to determine whether effluent limitations are needed in permits, not the site-specific standard applicant. Consistent with Minn. R. 7050. Subp. 7(c), any effluent limit determined to be necessary based on a modified standard shall only be required after the discharger has been given notice of the specific proposed effluent limits and an opportunity to request a hearing, as provided in Minn. R. 7000.1800. Additionally, any new or revised effluent limitation in a NPDES/SDS discharge permit is subject to public notification and comment during the re-issuance of that permit, and EPA has final authority to review effluent limitations.

The MPCA appreciates the considerable effort undertaken to develop a SSS application and hopes these comments provide greater clarity. U.S. Steel may submit a future SSS application should it compile the additional information, data, and justification needed to support an appropriate sulfate SSS for Hay Lake that protects the wild rice beneficial use. If you have follow-up questions, please reach out to me at [paul.pestano@state.mn.us](mailto:paul.pestano@state.mn.us) or 651-757-2090.

Sincerely,

*Paul Pestano*

*This document has been electronically signed.*

Paul Pestano  
Manager  
Water Assessment Section  
Environmental Analysis and Outcomes Division

PP:rjp

cc: See next page.

cc: Eric Williams, U.S. Steel Corporation (electronic)  
Tom Moe, U.S. Steel Corporation (electronic)  
Nicole Everson, U.S. Steel Corporation (electronic)  
Dana Vanderbosch, MPCA  
Darin Broton, MPCA  
Todd Biewen MPCA  
Courtney Ahlers-Nelson, MPCA  
Doug Wetzstein, MPCA  
Tanya Maurice, MPCA

*Important references (not exhaustive):*

- Johnson, N. W., Pastor, J., & Swain, E. B. (2019). Cumulative sulfate loads shift porewater to sulfidic conditions in freshwater wetland sediment. *Environmental Toxicology and Chemistry*, 38(6), 1231-1244.
- Kjerland, T. (2015). Wild rice monitoring handbook. The University of Minnesota Sea Grant Program. Publication #SH16. [https://drive.google.com/file/d/1GcWyVNQ-r\\_ywEdMZUnEThy0fj-uBltia/view](https://drive.google.com/file/d/1GcWyVNQ-r_ywEdMZUnEThy0fj-uBltia/view).
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- Vogt, D. J. (2023). *Wild Rice Monitoring and Abundance in the 1854 Ceded Territory (1998-2022)*. 1854 Treaty Authority. <https://www.1854treatyauthority.org/management/biological-resources/fisheries/reports.html?id=281&task=document.viewdoc>.