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Minnesota Pollution Control Agency
520 Lafayette Road North
Saint Paul, MN 55155-4194

Re: MPCA's Draft NPDES/SDS Permit Reissuance for USS Keetac Tailings Basin (MN0055948) and USS Keetac Mining Area (MN0031879)

To whom it may concern:

Thank you for the opportunity to provide comments on Minnesota Pollution Control Agency's (MPCA) Draft NPDES/SDS Permit Reissuance for USS Keetac's Tailings Basin and Mining Area, MN0055948 and MN0031879, respectively.

Minnesota's Wild Rice Sulfate Standard is Flawed and Must be Re-Evaluated

Minnesota's current 10 mg/L wild rice sulfate standard does not consider modern science nor include any consideration for observed or measured wild rice health in waterbodies. MPCA was directed to review and update the wild rice sulfate standard in 2011 but has not completed the task. Former Minnesota Governor Mark Dayton signed the 2011, 2015, and 2016 legislation relating to the revision of the wild rice sulfate standard, and he publicly stated that the standard is "antiquated" and "not even based on current science directly related to the conditions we're trying to deal with." *See* http://www.mprnews.org/story/2015/03/25/mpca-wild-rice. In the same news story, MPCA acknowledged that "no single sulfate value would be protective of wild rice at all sites" and "using the same limit for every river or lake where wild rice grows doesn't make sense because many factors influence whether wild rice will thrive."

MPCA must pursue another attempt at rulemaking that addresses the 2011 and subsequent years' legislation, resolves the Administrative Law Judge's finding from the failed 2017 rulemaking attempt, and reconsiders the modern scientific basis for a wild rice sulfate standard.

Modern research has consistently shown that aqueous sulfate has little-to-no direct impact on wild rice. Instead, conversion of sulfate to sulfide under a variety of environmental, sediment, and chemistry factors is the cause for potential, adverse outcomes on wild rice health. The numeric 10 mg/L surface water standard is based on outdated casual observations from a researcher's field notebook in the 1930's and 1940's and has undergone limited scientific review. MPCA must re-evaluate the basis for this standard and establish a more scientific-based numeric sulfate concentration or a narrative standard.

Since promulgation of the original wild rice sulfate water quality standard in 1973, there have been a significant number of peer-reviewed studies which could serve as the basis for modernizing the standard. For example, Tedrow and Lee (2022, paper attached) grew wild rice in two paddy-scale bioassays for two consecutive growing seasons (Paddy C) and three consecutive growing seasons (Paddy A) with sulfate concentrations at approximately 350 mg/L and 1,350 mg/L. No adverse influences on wild rice were observed in either case. Additionally, typical plant cell growth medium used for plant micropropagation purposes contains many times higher sulfate than the current standard. The following bullets and attached reference list following this letter provide additional information to support revised sulfate standard rulemaking.

- <u>Water depth and water depth fluctuations:</u> Wild rice is an annual aquatic grain, and as such must re-grow from viable seed each year. During early germination and seedling development, appropriately shallow water depth is critical to wild rice survival – light availability is more often the primary limiting factor for seedling development. Although influences on wild rice from water depth coincide with influences from other vegetation, suspended materials, and water coloration, overall water depth during seedling development in wild rice areas is of critical importance. Despite seedlings being more sensitive to overall water depth, observations and data indicate that the floating leaf stage of the seasonal wild rice growth cycle is more sensitive to water depth increases (Thomas and Stewart 1969; Stevenson and Lee 1987; Tucker et al. 2011; Tedrow 2020). This is due to physical root characteristics not being as thoroughly developed as in aerial phenology, and floating leaves themselves acting as 'sails' in water turbulence. Furthermore, following solar exposure a cuticle forms on the leaf's surface immediately following floating leaf development. Re-submersion of leaves with a formed cuticle can result in wild rice mortality due to gas exchange limitations (from cuticle development). Additionally, if the sampled water resource is more susceptible to increasingly intense precipitation events (i.e., creeks; rivers) wild rice habitats may be non-predictably adversely influenced by larger-scale weather pattern changes. Regardless of chemical water characteristics, if water sample locations, or water resources in general, are not conducive to wild rice growth and development due to water depth influences, identifying waters as "used for the production of wild rice" is not warranted.

- <u>Sediment characteristics:</u> Sediment in which wild rice tends to thrive is generally organic 'muck,' but of sufficient bulk density and integrity to allow rooted stability. This ties into water depth fluctuations – absent sufficient rooting stability due to loosely aggregated sediment, chemical water characteristics are a moot point. Wild rice can more easily uproot or become nutrient limited if sediment is too loosely aggregated (flocculent). Plant nutrient-element levels in sediment are also critical; in particular, ammonium nitrogen. Multiple studies have highlighted the importance of bioavailable ammonium nitrogen for wild rice growth and productivity; and how nitrogen sequestration in wild rice plant litter can result in a lack of bioavailable nitrogen (Archibold 1990; Walker et al. 2006, 2010; Sims et al. 2012a,b; Hildebrandt et al. 2012; Tedrow 2020; Tedrow and Lee 2021, 2022). Nutrient characteristics of sediment at water sample locations, or sampled water resources in general, also appear to be more critical than aqueous sulfate, or sediment sulfide, at much higher concentrations than measured in select waters proposed for sulfate-impairment listing (Tedrow 2020; Tedrow and Lee 2021, 2022). Regardless of chemical water characteristics, absent adequate, or more so, bioavailable sediment nutrient elements, and sufficiently dense aggregation of sediment materials, wild rice will not thrive in any water resources. Identifying waters with, based on existing data, sediment nutrient and / or bulk density limitations as "used for the production of wild rice" is not prudent.

- <u>Competing vegetation:</u> As an aquatic annual crop, wild rice must re-grow each year from viable seeds. In general, wild rice does not compete well with aquatic perennial plants, be they planktonic or emergent. Some aquatic plants have adapted a defense mechanism known as allelopathy. Basically, some aquatic plants produce compounds which are known to impair wild rice growth characteristics (Quayyum et al. 1999). Although not evaluated by Quayyum et al (1999), field observations suggest cattails (*Typha* spp.) may impede wild rice growth (Dysievick 2019). Multiple areas of cattail dominance (over 20 years in some areas), in previous wild rice harvest areas, were selected for a mechanical cattail removal project in Ontario. Following one mechanical removal event (Aug 2014), wild rice grew and thrived the following growing season (2015) in all areas where cattails had been removed. Following cattail removal, wild rice dominated each area the following growing season and continues to dominate each area. However, despite such rapid and dense wild rice re-growth, virtually no wild rice was (or is) growing in cattail dominated areas. This suggests, at the very least, idiopathic yet thorough adverse influences from cattails on wild rice. Regardless of chemical water characteristics, presence or development, of competing aquatic vegetation with either known or potential allelopathic effect on wild rice, can preclude any water resource from wild rice growth, development, and production.

<u>MPCA Improperly Evaluated Parent Corporation Finances, Ignored Facility Impacts and Did Not Examine Potential Widespread Community Socioeconomic Impacts</u>

MPCA erred when it conducted its evaluation of whether a variance is justified regarding 'Factor 6: Substantial and Widespread Economic and Social Impacts'. In its analysis, MPCA mistakenly relied exclusively on the profitability, liquidity, solvency, and leverage of the parent corporation and did not evaluate the economic impacts on the permitted facility. This approach is not consistent with EPA's Interim Economic Guidance (1995) (Guidance) which MPCA referenced as the proper basis for conducting this evaluation. EPA intended for this Guidance document to be used as a tool to examine the effects of water quality standards and treatments obligations on an affected facility. This is shown by EPA mentioning facility/facilities/discharger 147 times and only mentioning corporation/corporate four times.

First, in Chapter 3 of the Guidance, 'Evaluating Substantial Impacts: Private-Sector Entities', EPA clearly stated its intent to conduct the evaluation based on considerations at the individual factory/discharger/facility level – not based on the parent financial situation, as follows:

> *"After estimating the cost of the additional wastewater treatment, the next step is to measure the ability **<u>of the factory to pay for the additional treatment</u>**. If the analysis shows that **<u>the entity</u>** will not incur any substantial impacts due to the cost of pollution control (e.g., there will be no significant changes **<u>in the factory's level</u>** of operations nor profit), then the analysis is completed. If, on the other hand, the analysis shows that there will be substantial impacts on **<u>the entity</u>**, then the resulting impacts on the surrounding community must be considered (e.g. the impact of lost employment on the community's employment base, or the impact on the overall economy of the community). Impacts to the surrounding community, referred to as widespread impacts, are addressed in Chapter 4."* (emphasis added)

The Guidance goes on to state:

> *"Most of this Chapter is written in terms of evaluating whether there will be a **<u>substantial impact on a particular discharger</u>**. This type of analysis is necessary whenever there is a request for a variance. These same tests, however, can be used to analyze the impact on a group of **<u>dischargers</u>**, as might be the case in a use attainability analysis. For example, there may be several **<u>facilities</u>** that would confront similar requirements to improve their wastewater discharges in order to meet a higher water quality standard under consideration. The same primary and secondary tests would be used to measure substantial impacts in the dischargers. The difference would be, however, when the analysis moved to measuring widespread impacts. Here the impacts on the total group of dischargers (or all dischargers in the relevant reach) would be used to measure whether or not the impacts are considered widespread."* (emphasis added)

In the same Chapter, EPA's guidance further states, *"Since it is the* ***discharger*** *that will have to pay for the wastewater treatment, the* ***financial tests presented in this Workbook use data about the discharger's operations****"* (emphasis added). EPA goes on to describe that if information is not available at the discharge level, then the facility's data can be estimated as a portion of the economic information for the firm that owns or controls the discharger. EPA also discusses if a facility's products are not sold externally and are used or sold internally, then, "*the discharger's share of sales should be calculated by determining* ***the market value of the goods produced by the discharger****, using market prices for the year being analyzed"* (emphasis added). In other words, EPA never intended for the analysis to focus exclusively on the parent corporations' financial information in the manner that MPCA did when evaluating this request for variance.

EPA's Guidance describes one primary measure (profitability) and three secondary measures (liquidity, solvency, leverage) that should be used in the evaluation. Throughout this Chapter, EPA describes various tests that should be applied and frequently discusses the tests in the context of the discharger, not the parent corporation. For example, Chapter 3.2.a, Primary Measure: Profitability', the Guidance states,

> *"The Profit Test measures what will happen to the* ***discharger's*** *earnings if additional pollution control is required. If the* ***discharger*** *is making a profit now but would lose money with the pollution control, then the possibility of a* ***total shutdown or the closing of a production line must be considered****. Greatly reduced, but still positive, profits are also of concern. Likewise in the case of a proposed* ***facility*** *or proposed* ***expansion****; if estimated profits would drop considerably with pollution control, then the* ***development*** *might not take place."* (emphasis added)

EPA's Guidance does briefly discuss that the structure, size and financial health of the parent firm can be considered, but only in the context of determining the value of the applicant's product or operation to the parent firm. Nowhere in the Guidance document did EPA intend to base the economic impact analysis exclusively on the parent firm's finances and ignore the effects on the individual facility.

In the Fact Sheets for the two NPDES permits, MPCA did not attempt to evaluate the impact on the individual facility as required by EPA's Guidance document and as described in the preceding paragraphs. Also, MPCA did not properly evaluate whether the variance denial would cause widespread local economic and social impacts on the surrounding community as described in Section 2.4.4 of USS's sulfate variance application and in Chapter 4 of EPA's Guidance document. Therefore, MPCA's denial of the facility's variance request does not appear to follow EPA's Guidance document and should be re-evaluated. Accordingly, when MPCA conducts similar evaluations for other facilities' variance requests in the future, the analysis should focus primarily on the economic factors and affects associated with the individual facility.

In summary, before MPCA finalizes its decisions related to a sulfate variance and limit applicability in these draft individual NPDES/SDS permits and before MPCA places future limits in municipalities' or other industrial facilities' permits, MPCA must address the deficiencies identified in this comment letter.

Sincerely,

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Director – Environmental Compliance, Mining & Pelletizing

Enc.

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