"The LWRD opinion that 'There is insufficient data and information submitted that demonstrates that the aquifer and groundwater is being protected' is not supported by any factual information to indicate that the aquifer and groundwater are not protected and that the proposed mining presents a risk. For there to be a demonstration that the aquifer and groundwater are being protected, one must first explain the threats. Whatever the LWRD imagines as threats cannot be assumed to be public knowledge. The LWRD has provided no evidence to support the opinion that the aquifer and groundwater are at risk. Such statements are not scientifically based and are merely the personal opinion of the author."

"The fact is, the Wildcat Pit lake will not intercept and hold the water flowing toward the Sugar River. In general, the groundwater will flow through the pit lake, become surface water for a period of time and then flow through as groundwater. The Sugar River will remain the discharge point for groundwater flowing through the Wildcat Pit property."

"The proposed Wildcat Pit will also not have a negative impact on other nearby natural resources such as streams and wetlands."

LWRD acknowledges the Wildcat Pit will behave like a seepage lake, with some degree of groundwater flowing through and still ultimately discharging to the Sugar River or Badger Mill Creek. The threat is a potential change in local groundwater elevations and flow direction in proximity to the mining limits denoted by "Area of Concern" in Figures 1-3. Pumping and lateral effect (water naturally moving along a hydraulic gradient from higher to lower elevations) may decrease groundwater inputs to these waterbodies by changing the direction of shallow groundwater flow towards the mine (Figure 2). This is of particular concern during drought conditions when maintaining baseflow in streams is critical to protect water quality (temperature and dissolved oxygen) and aquatic life.

As mining activities proceed (excavation and hydraulic mineral extraction) groundwater will be drawn in contributing to a growing body of surface water. Impacts on local water table elevations and groundwater flow direction will be similar to the effects from a high capacity well (Figure 4), in concept, not necessarily in magnitude. An argument could be made that a high capacity well is an inaccurate analogy due to the mine operating as a closed loop system, where extracted groundwater will be returned to the surrounding aquifer post-processing, causing no changes to local groundwater elevations or flow paths. This is debatable due to:

1) Evapotranspiration from the lake surface
2) Water losses during processing
3) Unknowns related to:
    a. Rate of groundwater recharge from processed wastewater
    b. Rate of groundwater extraction from hydraulic dredging and lateral effect
    c. Connectivity with groundwater flow paths near the pumping zone of influence

The groundwater management plan included as Attachment 7 focuses solely on groundwater quality in terms of hazardous materials handling and spill response, with no mention of groundwater quantity.

The Applicant states in the discussion of groundwater quantity concerns that "the aquifer will have the capacity to provide the required water needs of the proposed mine with minimal impact on the groundwater table surface", and "with very little drawdown expected near the mine pit where water will be pumped and returned to the mine, there is no possible means to lower the water table near Sugar River or Badger Mill Creek." There are no details or quantitative assessments included to back up these claims, or to define what the required water needs/water balance of the mine will be or what is being labeled as "very little drawdown".

To demonstrate impacts the mine will have on local groundwater and surface waters (including wetlands) resources available to the Applicant include the 2016 Groundwater Flow Model for Dane County or consultation with local groundwater and water resources professionals at the Wisconsin Geological and Natural History Survey and/or United States Geological Survey. The MODFLOW software used in the model can simulate pumping and point source recharge, which could serve as an integrated quantitative analysis of the mining operations. Publications and research findings from applicable studies could also be used to support the Applicant's statement that the Wildcat Pit will not have a negative impact on nearby streams and wetlands.

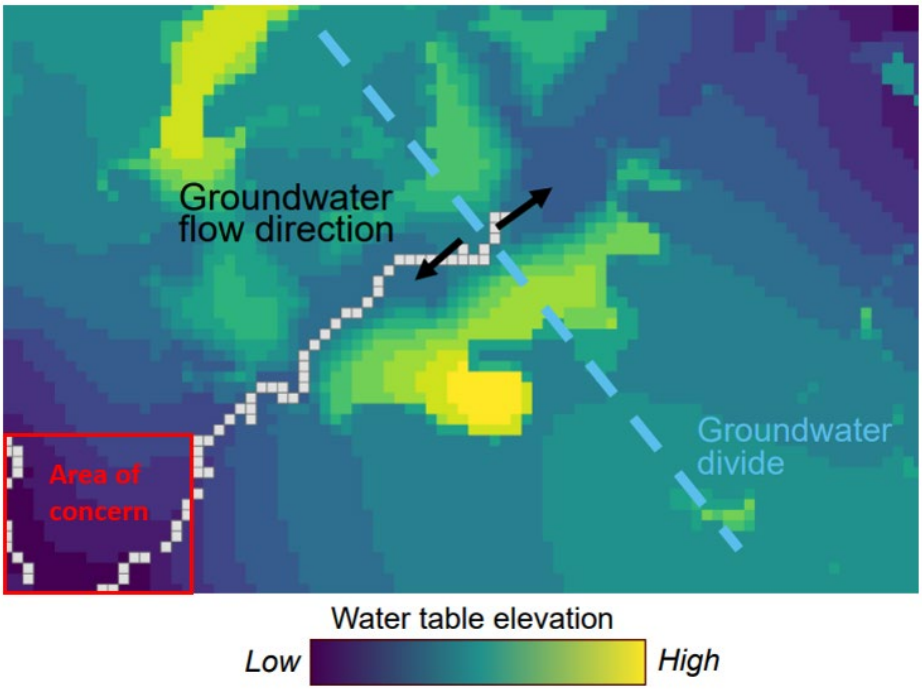

Figure 1. Badger Mill Creek-Sugar River groundwater flow direction and water table elevation.
Anna Fehling, Wisconsin Geological and Natural History Survey.

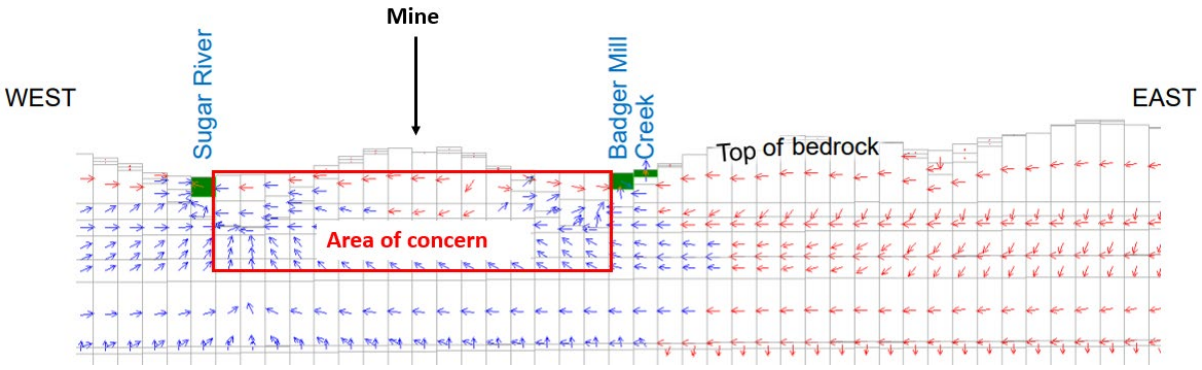

Figure 2. Badger Mill Creek-Sugar River groundwater flow direction. Anna Fehling, Wisconsin Geological and Natural History Survey.

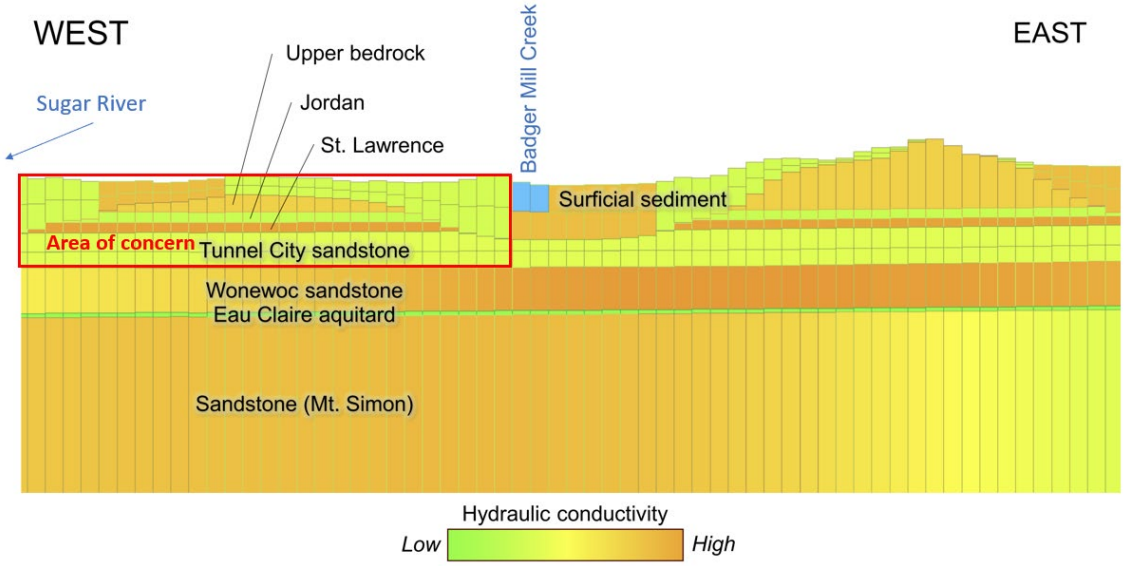

Figure 3. Geologic cross section north of confluence of Sugar River and Badger Mill Creek.
Anna Fehling, Wisconsin Geologic and Natural History Survey.

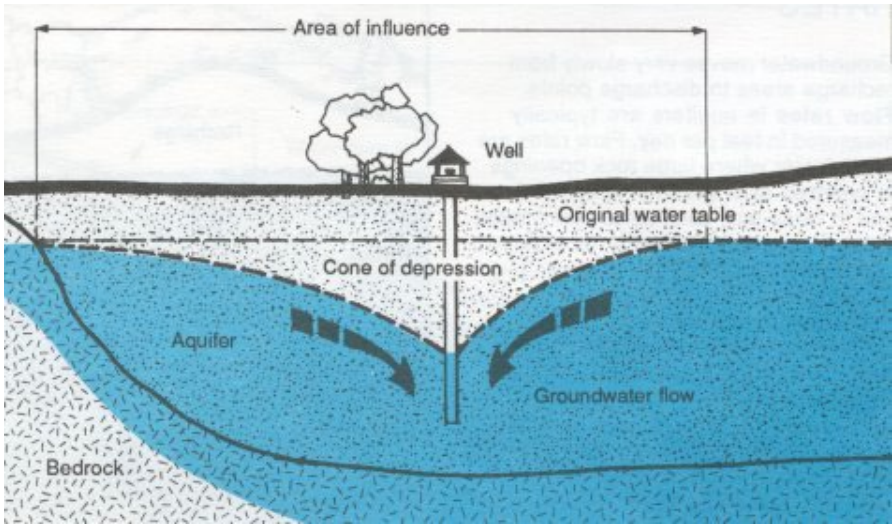

Figure 4. High capacity well effects on groundwater.
Source: Michigan State University Extension, Water Quality Bulletin # 35, August 1991.

"The Sugar River watershed is 217 square miles. The proposed Wildcat Pit lake may be about 70 acres, or 0.1 square miles. One-half the proposed Wildcat Pit lake area is in the Sugar River watershed and one-half is in the Badger Mill Creek watershed. One-half of the 70 acres, or 35 acres, represents 0.025% of the Sugar River watershed; insignificant by any measure."

Comparing the size of the Wildcat Pit to the area of the Sugar River and Badger Mill Creek watersheds is not a germane argument to illustrate the mine will not have an impact on nearby streams and wetlands. Evidence to support the Applicant's position should be appropriately limited, spatially, to the general vicinity around the proposed mine.

"Badger Mill Creek is a sewer."

Badger Mill Creek is classified by DNR as a Class 2 trout stream, meaning it is capable of supporting natural reproduction of trout with supplemental stocking, and is a valued recreational and environmental asset. Despite urban stormwater inputs and receiving treated wastewater discharges, the waterway is protected under the public trust doctrine as the foundation of Chapter 30, Wisconsin Statutes. LWRD has a shared responsibility in protecting the public interest in carrying out our mission, in addition to preserving and improving natural resources on our properties as an adjoining neighbor of the proposed mine (Parcels 060828385000, 060828380005, 060828395008 and 060828390003).

"There are no wetlands on the proposed mine property."

"Although wetland delineations may be necessary, the timing of that work is not justified before issuance of a CUP. The Applicant will delineate wetland areas prior to excavation in potential wetlands."

"The proposed mining operation will comply with County stormwater and erosion control standards under Chapter 14 during mine development."

The Applicant states there are no wetlands on the property, but there are multiple depressions and approximately 32.5 acres of mapped hydric soils within the 160 acres associated with the CUP application (Figure 5). Wetlands should be delineated to determine if adequate protection and buffering can be accomplished in administering Dane County Ordinances Chapter 11 and 14, relating to stormwater management and shoreland-inland wetland regulations.

Even with a wetland delineation, the conceptual stormwater management plan included as Attachment 10 lacks the detail needed to determine what impacts the mine will have on water quality (sediment and thermal). The Applicant acknowledges, as stated in Appendix G – Surface Water Fact Sheet, that "potential surface water quality impacts may arise from stormwater or process water used to wash sand, gravel, and crushed stone of fine clay and silt particles." For a proposed land use and disturbance of this size, type and duration additional information regarding stormwater management is warranted at this time to inform if environmental standards can be met as part of the CUP application review.

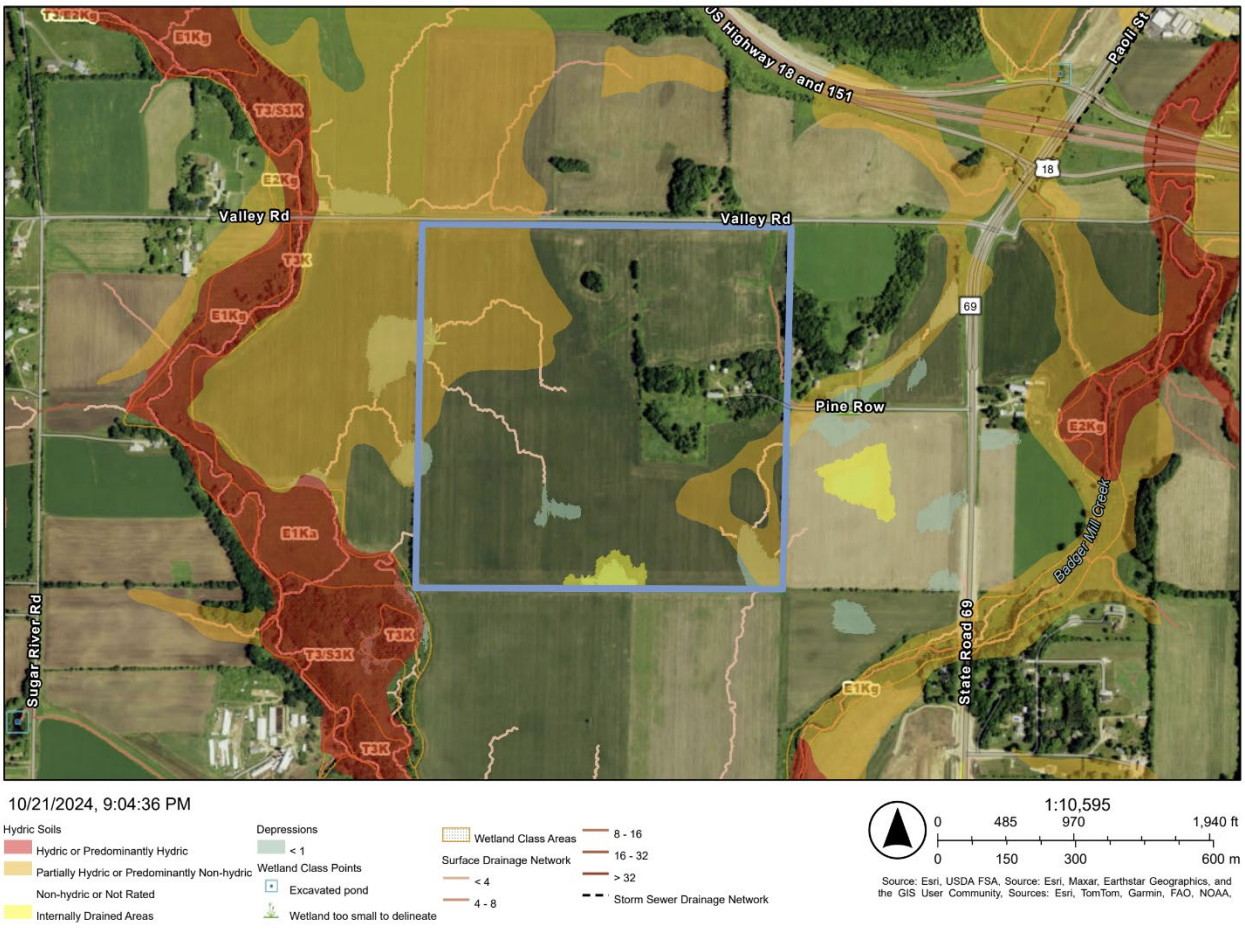

Figure 5. Hydric soils, depressions, internally drained areas and drainage patterns within the proposed mine site. Source: Dane County DCiMap Version 5.6.

"A much greater risk to the rivers in the area are the livestock that are free to enter the river affecting the stream banks and bottoms and add waste directly into the water or as stormwater runoff."

Dane County addresses this risk through the implementation of Dane County Ordinance Chapter 49 (Agricultural Performance Standards and Manure Management). The purpose of this ordinance is to "provide for proper and safe storage, handling, and land application of manure and to reduce the delivery of manure, other waste materials, fertilizers, and sediment to surface waters and groundwater through the use of conservation practices and implementation of state performance standards and prohibitions for agriculture." Chapter 49.08(6) Manure Management Prohibitions applies to all livestock operations and states that operations shall have: "no unconfined manure piles within a water quality management area; no direct runoff from feedlot or stored manure to waters of the state; no unlimited access by livestock to waters of the state in a location where high concentrations of animals prevent the maintenance of adequate sod or self-sustaining vegetative cover". Chapter 49.23 Enforcement also outlines the options for ensuring compliance with this ordinance. Therefore, the risk of having manure entering streams and livestock damaging streambanks is reduced as agricultural operations are required to comply with Chapter 49; and, if they do not, Dane County has specific options to implement to bring them back into compliance.