Mining Action Group
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Additional Public Comments

Aquila Back Forty *"Wetland Augmentation" Plan*

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Wetlands Augmentation: Awful, Lawful?

WHAT IS AQUILA PROPOSING?

According to a new file uploaded to MiWaters, the company has created a Wetland Augmentation Plan. Augmentation in this case means artificially refilling to offset the industrial impact to a wetland. Augmentation involves moving water from one regulated waterbody to another, or pulling from groundwater to flood a wetland, or the reuse of industrial "process water" or municipal wastewater to "improve wetlands." The legal term for this movement is "Water Transfer." Aquila is planning a transfer or diversion of water from the Menominee River to refill wetlands that will be impacted by drawdown during the project's Life of Mine — ostensibly, this will address only the impacts beyond their current wetland

impact estimates, or beyond their currently predicted modeling. Will this help the company slip past full environmental permit considerations?

The Mining Action Group's previous public comments did not address the "wetland augmentation" issue. Reviewing Aquila's response to the EPA, we note that the company has significantly hedged the validity of their wetland impact assessment:

> ***"As a final comment on the assessment of potential indirect impacts, it should be reiterated that confirmation of the findings pursuant to the modeling can only be accomplished by wetland hydrology and vegetation monitoring during mining operations.*** *As such, adaptive management measures, such as augmentation of wetland hydrology, will be considered based on monitoring results. The monitoring and adaptive management measures are discussed in the Proposed Wetland Monitoring and Adaptive Management Plan found in Appendix B-10 of the Application."*

We disagree. In this statement, the company's position appears to be "We don't know for sure, but if our hydrological predictions were inaccurate, we'll use WETLAND AUGMENTATION to keep everything wet."

The role of the "adaptive" management measures was understated in the Wetland Permit application, but is now taking a more important role – that of glue – as Aquila's hydrological modeling falls apart.

WHAT IS WETLAND AUGMENTATION?

> "Streamflow and wetland augmentation is the addition of waters to surface water bodies to supplement low flows, thereby sustaining the surface body ecosystem (Guerra et al. 2011). Augmentation, therefore, can minimize the effects of low-flow drought and provide benefits such as aesthetics or habitat conservation (USEPA 2012). Over-allocated water resources, where water taken from a surface body exceeds the flow or does not meet the needs of downstream users, can be ideal situations for produced water augmentation (Guerra et al. 2011). The designated use of the water body is a critical consideration, as is the presence of native aquatic life (USEPA 2012). Salts, hydrocarbons, VOCs, trace elements, and chemical additives within the produced water can potentially cause toxic effects to aquatic organisms and wildlife. Some produced waters can also have high temperatures, high pH, and low dissolved oxygen, so their direct discharge to open waters can be detrimental to the health of aquatic organisms. Other important parameters to consider include impacts of elevated flows (e.g., erosion) and total quantity losses due to evaporation (Guerra et al. 2011). Similar considerations need to be taken when using treated produced water to support natural wetlands. The benefits include helping systems gain beneficial wetland acreage, and supporting habitat diversity as well as biodiversity, healthy fisheries, and nursery grounds. Wetland creation can also mitigate flooding and provide recreational and educational benefits (USEPA 2012). In addition to augmenting water flow in natural wetlands, artificial wetlands can be constructed for the treatment of produced water. Clemson University, in partnership with industry, developed and applied treatment using constructed wetland systems to decrease targeted constituents in produced waters. Pilot scale studies were conducted at the university and a demonstration project was performed within a producing coal bed methane field near Berry, Alabama. Treatment performance results indicated that these systems can be designed and built to promote specific environmental and geochemical conditions to reduce COPC concentrations (Castle et al. 2013). In another study, feasibility of

treating produced water using constructed Downloaded by [Mr Earl L. Hagström] at 10:16 05 May 2016 130 E. L. HAGSTRÖM ET AL. wetlands at the Rocky Mountain Oilfield Testing Center indicated improved water quality with wetland functions similar to those found in natural wetlands (Veil et al. 2004)." [1]

WHAT TRIGGERS THE PROPOSED AUGMENTATION?

Aquila will be directly (destroying) and indirectly (impairing) wetlands at the Back Forty site. The diagrams included show two new pipelines in the river feeding multiple wetlands, but the total amount of water to be pumped seems very low and uneven. None of these pipelines were included in site diagrams for the Mine Permit, or NPDES. Construction of the northern pipeline appears to pose a new disturbance threat to archaeological/cultural sites identified as important to the Menominee Indian Tribe of Wisconsin.

Augmentation appears directed to all three main wetland complexes that will be "indirectly impacted" through deprivation of groundwater, surface water recharge, or both. Their Augmentation plan is extremely fuzzy but refers to "trigger" conditions (water levels?) but also triggering "events."

The plan does not appear to describe a legal requirement but rather a list of potential options (could, would) for handling additional wetland impacts – even though wetland impacts themselves require compensatory mitigation by law. Augmentation was newly described in the Company's March 8th response to EPA, as follows:

> **Miscellaneous Comments from USEPA Letter Enclosure**
> These comments appear in the USEPA letter enclosure and were not included with the summary comments. In an effort to address all comments comprehensively, responses are provided below.
>
> **Adaptive Management**
> To address the suggestion that the Adaptive Management Plan should include specific adaptive management metrics and impact thresholds, Aquila is proposing the following:
>
> **Establish Off-Site Control/Reference Wetlands**
> ***Up to*** *six off-site control/reference wetlands* ***could*** *be established in 2018 in consultation with MDEQ. Ongoing access to these wetlands will be dictated by off-site landowners who* ***would allow*** *such activities, e.g., Michigan Department of Natural Resources. The data collected* ***would*** *include an established baseline and continue over the life of mine, focusing on comparative hydrology. Potential wetlands to be used for this purpose* ***would be*** *identified and* ***proposed*** *to MDEQ* ***for a determination*** *as to the appropriateness of their use as control/reference areas. The wetlands* ***would be*** *well outside of potential influence from the Project and other significant interferences. Piezometers* ***would be*** *installed in each wetland and data* ***would be*** *regularly collected of near-surface water levels throughout the growing season. Vegetation surveys* ***would be included.***
>
> **Identify Thresholds** *Identification of a Project-related impact (threshold) would be based on a comparison of the on-site and off-site hydrology data to the appropriate baseline data. A threshold* ***may be met if*** *during the growing season there is a 6 inch or greater decrease in the*

[1] http://files.brattle.com/files/7295_produced_water_emerging_challenges_risks_and_opportunities.pdf

near surface water table elevation compared to the near surface water table elevations being monitored in control/reference wetlands. [2]*The threshold* ***would be*** *further supported with monitoring data on wetland plant community changes. Each on-site wetland has baseline data established in accordance with MDEQ Wetland Identification Program. Pre-construction vegetative data will also be collected in 2018 in accordance with the proposed "Wetland Vegetation Assessment Reporting" as outlined in Appendix B-10.* ***Over the life of mine,*** [3]***a change to the average "Wetland Indicator Number" index value for a sample point exceeding 2 in any individual wetland will be considered a threshold.*** *Additionally, should an individual wetland with an average "Wetland Indicator Number" index value of zero or less develop an average score greater than 0, this will be considered a threshold of impact for that wetland.*

Regarding the verification that augmentation would be a "viable long-term strategy," Aquila proposes the following: *Augmentation of near surface wetland hydrology would be implemented by the installation of a multi-outlet pumping/irrigation system, using the Menominee River as a water source. Subject to MDEQ review and approval, the implementation would likely involve the placement of an irrigation system in the upland areas immediately adjacent to each potentially impacted wetland. Appropriate volumes of water (as determined by MDEQ) would be discharged evenly around any given wetland,* ***most likely early in the growing season in such a manner as to recharge the near surface waters and imitate natural/ pre-operation conditions.*** [4]

WHAT DOES THE LAW SAY?

Has "Wetland Augmentation" been specifically authorized under Michigan law? Unclear. For example, an article discussing augmentation using wastewater in North Carolina law: "The new term for this wastewater dispersal process is "wetland augmentation" and **would be approved in North Carolina if a "net environmental benefit" can be quantified."**[5] If Wetland Augmentation is an approved method for off-setting wetland impacts in Michigan, where is this detailed? What, if any, is the "NET ENVIRONMENTAL BENEFIT" claimed by Aquila?

- On the federal level, water transfer appears to be exempt from NPDES. That has been a contested issue for the past decade but apparently "decided" earlier this year: https://www.americanbar.org/groups/environment_energy_resources/resources/wotus/water-transfers.html
- Last year's legal case on Water Transfers Rule, 14-1823 (L) *Catskill Mountains Chapter of Trout Unlimited, Inc. v. EPA (Catskill III)* https://cases.justia.com/federal/appellate-courts/ca2/14-1823/14-1823-2017-01-18.pdf?ts=1484753412
- Good summary of issues (where water transfers are between bodies of water): https://www.jdsupra.com/legalnews/epa-s-water-transfers-rule-resurrected-29293/

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[2] This threshold should trigger formal permit amendment or review, consideration of additional wetland impacts, additional compensatory mitigation, etc. – not simply a trigger to pull water from the Menominee River to offset the new loss!
[3] Since the Life of Mine remains highly disputed, this phrase should be avoided.
[4] This simplistic view fails to consider wetland impacts related to groundwater, seasonal precipitation changes, etc. In October 2017, for example, many vernal wetlands in Upper Michigan contained levels of water normally seen during April or May.
[5] http://people.uncw.edu/hillj/classes/EVS595/Dortch%20-%20Wetland%20Augmentation.pdf

What are the legal requirements of wetland augmentation are under federal wetland permitting, and where is it being used in the mining industry? Comparable examples are requested. On a wildlife level, USFWS projects have used augmentation to create habitat for migratory waterfowl, for example.

COMPENSATORY MITIGATION?

Can wetland augmentation be used to replace or bypass the mine's wetland compensatory mitigation requirement? The answer must certainly be no: compensatory mitigation planning still comes first, required by federal and state law. Augmentation appears to be a fairly new idea – a "mop-up" approach for dealing with the mess created by shoddy permit applications, or fuzzy math contingency planning, enabling a mine project to exceed calculated wetland impacts, should the operation cause 'unanticipated' wetland impacts. This seems unacceptable, since it would sidestep full disclosure of impacts in the Compensatory Mitigation review, and all questions pertaining to LEDPA.

The (EPA's Water Transfers) rule allows transfers of waters from one body to another without a permit under the Clean Water Act "if there is no intervening pollutant added through the transfer or a treatment." So we recognize there appears to be an exemption[6] from NPDES for the proposed water transfers, even when the water (Menominee River) contains pollutants, and the receiving body (Back Forty site wetland complexes) would be clean or pristine.[7] Nevertheless, the practice of "wetland augmentation" using water from the Menominee River will endanger the more pristine water bodies -- in this case, these are "headwater" wetlands[8] at the mine site -- three wetland complexes, with nothing 'upstream' from them except the mine/mill site. Is Aquila's proposed wetland augmentation legal, given the obvious risks of contamination and wetland degradation posed to these wetlands? Due to their relative elevations, Back Forty wetlands do not receive inputs of river water.

WHO IS DOING THIS?

In a regional example, the Polymet Mine project in Minnesota is proposes to "augment" some loss of flow in streams and wetlands caused by their tailings operation, pulling water from Colby Lake, which was previously diverted to provide process water for historic tailings processing at the same milling site. **By comparison, however, the Aquila Back Forty site has no historic brownfield or contamination.**

Locally, Eagle Mine's Humboldt Mill will soon be requesting to pull water from the Middle Branch of the Escanaba River (via pipeline) and pump it to the "Humboldt Wetland Mitigation Bank" owned by Lindberg & Sons, which is upstream of the pumping site, and north of the Humboldt Pit. Lundin said they are not planning to use or treat the river water, just transfer it and release it. This plan sounds like augmentation, but we haven't seen anything specific calling it a wetland augmentation plan. **As a State of Michigan Wetland Bank, the "Humboldt Wetland Mitigation Bank" is not monitored for water chemistry** (the assessment of the wetland bank, while supposedly protected in perpetuity, is limited to visual assessments looking for obvious contamination like oil slicks, garbage, foaming...).. If the water transfer is accomplished using the pipeline previously authorized under the Humboldt NPDES permit, and using the Humboldt Mill Water Treatment Plant to pump the water, will the transfer / augmentation be regulated by

[6] https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P10099U2.txt
[7] https://www.reuters.com/article/us-usa-court-water/u-s-supreme-court-rejects-challenge-to-epa-water-regulation-idUSKCN1GA1V4
[8] https://www.martenlaw.com/newsletter/20080618-water-transfers-exempt

a NPDES or other WRD permit? Since the water will be diverted toward a previously established mitigation bank regulated (loosely) by MDEQ, will a wetland permit be needed?

Will the Wetland Augmentation plan (pipelines, pumps, triggers, contamination) be regulated by law under Part 301, 401, NPDES, other?

Wetland Augmentation may have beneficial uses for municipal water treatment, or creation of waterfowl habitat, but appears to function as a loophole in the case of mining companies.

OUR UNANSWERED QUESTIONS – AQUILA's WETLAND AUGMENTATION PLAN

- What will be the impacts to aquatic life (salamanders, frogs)? The Wetland Augmentation Plan does not mention biological monitoring onsite or reference wetlands.
- How will the collected data (wetland drawdown, wetland impacts) be shared? No mention of data transparency or publication of the monitoring data (and they have no CEMP monitoring).
- The Wetland Augmentation Plan proposes transfers at various times throughout the entire year. Will augmentation (inputs) mimic seasonal water level changes?
- Will augmentation be used to correct for droughts, or follow a local trend? For example, will augmented wetland water levels be pinned to match those in "control wetlands", or pinned to pre-mine water levels? Not mentioned in the plan.
- Will the proposed water transfer cause invasive species (zebra mussels, plants) from the river to colonize these inland wetlands, causing further degradation?
- Will metals, VOCs, mercury, or phytotoxic elements from the river water accumulate in the wetlands, creating contaminated soil? A detailed comparison of their water quality is needed, for baseline purposes, but this is not detailed in the Augmentation plan.
- Aquila's well-documented intent is to pursue underground mining, If the company amends the mining permit to pursue the Back Forty orebody through underground mining, it will more-than-double the mine's life, and expand the dewatering. Will the Back Forty Wetland permit need to be revised at that time? or will the Wetland Augmentation plan be dramatically revised (outside of the Wetland permit or public comment), with water transfer compensating for increased duration of dewatering and indirect impacts due to water balance loss?
- River water and wetland water pH are mismatched. How will this hinder, prevent or artificially stimulate plant growth (eutrophication), changing the natural aquatic ecosystem of the wetlands and impacting species that rely on them?
- It is MDEQ's mandate in the wetland permitting program to make a fully-informed assessment of the functions and values of wetlands that would be impacted from an applicant's proposed actions, and if a permit is to be issued, to require mitigation that fully compensates for the impacts to those functions and values, including the acreage of impact. Aquila's proposed water augmentation plan leaves it to the future to detect and measure indirect impacts to wetlands from their operations. This is unacceptable, and makes it likely that impacts will not be detected on a timely basis, and that the mitigation of those impacts may further impact the wetlands receiving augmented water input, as detailed in these comments.
- Aquila's suggestion that reference wetlands be established on State (MDNR) property is completely unacceptable. This would be convenient and without cost for Aquila, but would be an unacceptable use of resources that belong to the citizens of Michigan, and should not be contemplated.
- There is no timeline specified in Aquila's plan for monitoring and/or augmentation. *Would this "augmentation plan" be for the full life of mine? In perpetuity?* If impacts may be expected to

continue for an indeterminate time, funds must be assured to continue for these activities in perpetuity. Once the mine is played out and closed, who will do the mining and augmentation? How will funds be assured to pay for these activities?

In sum, we are extremely concerned that wetland augmentation using diversions of Menominee River water could present new problems. Any pollutants from the Menominee River, transferred into the wetlands during the Augmentation process, will undoubtedly have a long residency, exacerbated by the inputs of heavy metals from the mine site dust.

The Wetland Augmentation plan requires additional public comment and due regulatory consideration to avoid unintended impacts, since the Back Forty site wetlands are more vulnerable to pollution than the river due to water volume, flushing rate, etc.

Significant additional wetland impacts have come to light at the Back Forty site, following the recalculations of groundwater modeling using Pierce methodology. Aquila fails to demonstrate that these wetland impacts are unavoidable, and fails to identify feasible alternatives for their proposed milling operations, required under proper LEDPA review. The applicant's compensatory mitigation plan has not been adequately modified to reflect the additional wetland impacts, and uses the "least desirable method of mitigation." The applicant's new "Wetland Augmentation Plan" is a bandage on a broken limb.

We ask the State of Michigan to deny the Wetland permit application.

Thank for your consideration of our comments, questions and requests.

Kathleen Heideman
Submitted on behalf of the Mining Action Group of the Upper Peninsula Environmental Coalition