Mining Action Group
Attn: Upper Peninsula Environmental Coalition
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Public Comments

Humboldt Mill Permit Amendment Request

"Condition F.4 of MP-012010"

Submitted December 26, 2017
Attn: MDEQ Office of Oil, Gas, and Minerals

Aerial photograph showing Humboldt Mill Wastewater Treatment Plant, and the north end of the Humboldt Pit Lake, referred to by the permit amendment request as the "Humboldt Tailings Disposal Facility" (HTDF) or the "facility." Photo by Jeremiah Eagle Eye, 2017.

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REFERENCES

Note: Our comments reference application materials submitted by Lundin Mining, including the Request for Amendment of Mining Permit MP-012010 Condition F.4 (HTDF pit); the Mining Permit Application Amendment (Vol. I) ; and the Environmental Impact Assessment (Vol. II) . Other references include Lundin's Annual Mining and Reclamation Report on Humboldt Mill 2016; Michigan NREPA; and Part 632 Nonferrous Metallic Mining Regulations.

CONCERNS

Applicant Fails to Meet "Burden of Proof"

The Mining Action Group (MAG) of the Upper Peninsula Environmental Coalition (UPEC) finds that Lundin's requested Permit Amendment is unsupported by relevant evidence or data. It is unclear why the amendment request was deemed "administratively complete" given the total lack of supporting reports or Environmental Impact Assessment updates as expressly required by Part 632 (see Rule 425.206, Amendment of permits). Our concerns, in reviewing this permit amendment, are largely based upon a troubling absence of supporting information, in part due to the Company's failure to respond to multiple requests by stakeholders (KBIC, CEMP, MAG and statements by other concerned individuals) for additional data.

As the DEQ's Joe Maki acknowledged during the recent Public Meeting, held to discuss this amendment request, the burden of proof remains on the applicant. Part 632, 324.63205 states: **"(3) The applicant has the burden of establishing that the terms and conditions set forth in the permit application, mining, reclamation, and environmental protection plan, and environmental impact assessment will result in a mining operation that reasonably minimizes actual or potential adverse impacts on air, water, and other natural resources and meets the requirements of this act."** Clearly, the applicant has failed to meet the "burden of proof" as required under NREPA and Part 632.

Additional information relevant to this permit, and an expanded monitoring regime, have been requested by CEMP, as follows:

- The parameter list being used for Eagle Mine's Humboldt Tailings Disposal Facility (HTDF) geochemistry monitoring program (66 parameters).
- The HTDF geochemistry monitoring program data.
- Periodic split sampling at locations included in the HTDF monitoring program.
- Addition of parameters to CEMP split sampling of the Humboldt Mill water treatment plant influent and effluent, *including non-permit required parameters identified from the HTDF geochemistry monitoring program.*

The failure of the applicant to provide geochemistry monitoring data and modeling reports with the permit amendment application is a serious omission that should result in the application being considered administratively incomplete. MAG fully supports CEMP's request.

We are especially concerned about the expanded parameter list used for monitoring the HTDF's geochemistry. These "66 parameters" were first mentioned during a presentation by Devin Castendyk, a senior geochemist working for Hatch Consulting on behalf of Eagle Mine. While Castendyk's presentations to the public were informative and appreciated, and acknowledged and referenced by the DEQ during the recent Public Meeting, most of the information discussed by Castendyk is wholly outside of the permit amendment: his presentations relied upon data and visualizations of "proprietary" modeling and monitoring results for the HTDF that were not provided to the public during this permit review. Following the lecture, a number of stakeholders requested digital copies of Castendyk's slide presentations and copies of the modeling report and geochemical monitoring data, but these materials have not been provided by Lundin, to whom he deferred the request. Castendyk's slide presentations were also not included as supporting documents with this permit amendment, and therefore cannot be used to substantiate the permit request.

DEQ Determination – Humboldt Pit Lake is NOT "Waters of the State"

Most fundamentally, we must ask again whether the Humboldt Pit Lake is a lake, or not? Are these "waters of the state"? If so, how is the State protecting this natural freshwater resource?

The Lake, according to Lundin's water balance data (reviewed in previous permits) is comprised of water from precipitation, groundwater inflow, and tailings process water. Michigan's Part 31 program defines "waters of the state" as ".... groundwaters, lakes, rivers, and streams and all other watercourses and waters, including the Great Lakes, within the jurisdiction of this state." [Part 31, 324.3101 (aa).] **This definition would appear to include the Humboldt Pit Lake, albeit compromised by the addition of toxic mine tailings.** Other lakes are comprised of precipitation and groundwater, if not mine tailings process water.

If the Humboldt Pit Lake is considered "waters of the state", the DEQ is obligated to protect and enhance its water quality. Instead, the DEQ has permitted a steady **degradation of water quality** under this mining permit, and the **water quality of the lake would be worsened under the proposed amendment.**

According to the amendment application: "There are **no performance requirements to maintain a certain water quality within the HTDF during operations,** provided the treated water quality is acceptable." How about post-operations? Define "acceptable"? **Applicant should clearly explain how, when, and to what extent the water of the Humboldt Pit Lake will "maintain a certain water quality" after milling operations have ceased.**

According to Michigan NREPA Part 4. Water Quality Standards R 323.1041 Purpose. Rule 41, *"The purpose of the water quality standards... is to establish water quality requirements applicable to the Great Lakes, the connecting waters, and all other surface waters of the state, to protect the public health and welfare, to enhance and maintain the quality of water, to protect the state's natural resources, and to serve the purposes of Public Law 92-500, as amended, 33 U.S.C. 1251 et seq., Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, MCL 324.3101 to 324.3119, and the Great Lakes water quality agreement enacted November 22, 1978, and amended in 1987. These standards may not reflect current water quality in all cases. Water quality of certain surface waters of the state may not meet standards as a result of natural causes or conditions unrelated to human influence. Where surface waters of the state may have been degraded due to past human activities and attainment of standards in the near future is not economically or technically achievable, these standards shall be used to improve water quality. These standards are the minimum water quality requirements by which the surface waters of the state shall be managed."* Part 4 makes no exceptions for man-made lakes, or lakes containing tailings process water. It is possible that waters in the epilimnion layer, due to clean inflow, currently meet water quality standards. Without additional geochemistry data from the applicant, it is impossible to know the current "water quality" of the pit lake though. Absent this hard data, is seems reasonable to assume that the lake's water quality is steadily degrading. Damages to natural resources appear likely.

According to the DEQ, "Water Quality Standards are the foundation of the water quality-based pollution control program mandated by the Clean Water Act. Water Quality Standards define the goals for a waterbody by designating its uses, setting criteria to protect those uses, and *establishing provisions such as antidegradation policies to protect waterbodies from pollutants.*"[1] **If this permit amendment request is granted, however, water quality in the Humboldt Pit Lake will be further degraded.**

Lundin recently described proposed changes to their NPDES and WTP technology: under the Humboldt NPDES permit, Lundin would leave the epilimnion layer untouched – letting the freshwater cap increase in depth, in essence. Lundin will instead start to pull water from the hypolimnion layer, where it is most polluted, treat it in the WTP, and pump the remaining waste material (now contaminated by TDS brines and heavy metals) back down to the hypolimnion for disposal, creating an ever-more polluted bottom level of the pit lake. According to the Mining Journal's interview with Amanda Zeidler of Lundin Mining:

[1] http://www.michigan.gov/deq/0,4561,7-135-3313_3681_3686_3728-350340--,00.html

"Eagle is going to start treating the dirty water from below, while the mill too will begin taking processed water from lower down. Since Eagle won't use this clean water anymore, that cleaner layer in the pit should get bigger and the dirtier water should lessen because it will be treated, said Zeidler, who pointed out changes also are planned for the water treatment process."[2]

While this may be a cost-effective method of waste disposal for Lundin, it is not clear how this method could be legal – especially as the bottom level of the pit would be raised incrementally as the additional tailings are deposited, bringing the contamination closer to the surface. Water quality should be ensured at all depths of a lake. The State of Michigan's Part 4 Rules, Water Quality Standards (of Part 31, Water Resources Protection, of Act 451 of 1994), **specify water quality standards which shall be met in <u>all waters of the state</u>.** If Humboldt Pit Lake is regulated as a lake, its water quality should be protected.

The State has denied any responsibility to protect water quality in this lake, yet the State of Michigan issued a Part 301 Inland Lakes and Streams permit, recognizing the Humboldt Pit Lake as a LAKE, and "regulating the elevation of tailings deposited in the Humboldt pit (lake)" – "permit to fill the HTDF with 1.83 million m^3 of tailings to a maximum thickness of 23 m" which was subsequently expressed as "2.4 million cubic yards of tailings to a maximum depth of 75 feet in thickness." This Inland Lakes and Streams permit was granted a "minor revision" in April 2017, without the opportunity for public input, increasing the maximum thickness to 95 feet, without changing the total quantity of tailings. This "minor revision" was accompanied by an unreadably poor map, and the application failed to provide some of the basic information that a Part 301 review request, such as:

No	10B	Part 115 of NREPA	Part 301 and Part 325: If the project is in an Area of Concern (AOC) or in an area of suspected contamination, has a sediment analysis or other option for spoils disposal been submitted?

These permits are only issued for fill added to inland lakes and streams; for projects where "in general, the applicant must show the project <u>will not adversely affect the public trust."</u>

We strongly believe that the Part 301 Permit issued for the filling of Humboldt Pit Lake with tailings adversely affects the public trust. If the requested amendment of the Humboldt Mill Permit MP-012010 is granted, the Part 301 Permit will also need to be revised again, as the two permits essentially authorize the same activity (deposition of tailings), and the total quantity of tailings is now proposed to increase. These permits should be discussed in a coordinated manner.

Under Michigan law, *"Part 301, Inland Lakes and Streams, of the Natural Resources and Environmental Protection Act, 1994, Public Act 451 (...) requires a permit from the Water Resources Division of the DEQ for certain construction activities on inland lakes and streams. The Inland Lakes and Streams Program is responsible for the protection of the natural resources and the public trust waters of the inland lakes and streams of the state."*[3] Under Part 301, the Humboldt Pit is clearly being regulated as a "lake", and it IS treated as "waters of the state." In light of delegated authority for the Clean Water Act, Michigan DEQ should treat the Humboldt Pit Lake as "waters of the state" and the DEQ should work to <u>protect existing water quality</u>, rather than allowing degradations from the additional loading of toxic tailings materials, as proposed by this permit amendment request.

According to DEQ's Steve Casey, there is an *exemption* to the Part 301 statute *for lakes used for the purpose of treating sewage waste* – in which case, according to Casey, such lakes are considered *facilities*, and not required to meet Michigan water quality standards. The passage he cited is: <u>" (c) "Surface water" means all of the following, but does not include drainage ways and ponds used solely for wastewater conveyance, treatment, or control.</u> Casey cannot point to a single example, however, of a similar lake or mine pit lake treated similarly. When asked for more information about this statement – *"determination that the HTDF is a disposal site and is not "waters of the state"* – Casey stated that the determination was not a *formal decision* and that there was "probably no record of decision" or paperwork documenting the determination. **It is important to remember that**

[2] http://www.miningjournal.net/news/front-page-news/2017/11/changes-coming-to-facility-tailings-disposal-site/
[3] http://www.michigan.gov/deq/0,4561,7-135-3313_3681_28734---,00.html

an exemption under one Part of NREPA does not exempt an activity from the requirements of other Parts.

There remains some regulatory confusion about this. Again, according to the State's original response to public comments on the Humboldt Mill Permit MP-012010, "*The DNRE has made the determination that the HTDF is a disposal site and is not 'waters of the state' with respect to water quality issues."* Melanie Burdick of EPA Region 5[4], when asked why the DEQ does not consider the Humboldt Pit Lake to be "waters of the state", replied that she was sure that "Mr. Casey had misspoken."

By issuing a Part 301 permit, authorizing the placement of the tailings ("fill") within the Humboldt Pit Lake, the DEQ is treating a toxic mine waste product, loaded with salts and heavy metals, as if the tailings were a more benign or inert material like sand, crushed rock or mud. Obviously, the industrial *usefulness* of a water body should not determine or define the level of protection it receives under the Clean Water Act (CWA) which has been delegated to Michigan to uphold.

We find a fundamental contradiction, and a regulatory failure to protect natural resources under Michigan's NREPA, that the Humboldt Pit Lake is treated as an "Inland Lake or Stream" under Part 301, yet not regarded as "waters of the state" under Part 31. At some point, after years of further degradation, Lundin claims that this polluted pit lake will become an "integrated part" of the Escanaba watershed. The true test will come post-closure, when Lundin Mining is finished using this lake, when there is no active NPDES permit, and when Lundin no longer benefits from depriving the Humboldt Pit lake of CWA protections. Will the pit lake *automatically* revert to a "water of the state" designation? Will it be listed as an "impaired" waterbody? More importantly, how will it *function* at that point? Steve Casey recently said he could not answer that question, and perhaps this case has yet to be clearly determined, as it appears to be a legal outlier. Time will test this legal fiction, and may find that Michigan's regulators have failed this body of water.

DNRE's Assertion that *"HTDF is a disposal site and is not 'waters of the state' with respect to water quality issues"* Fails to Protect Migratory Birds or Raptors

Water quality in the Humboldt Pit has been seriously degraded by Lundin's milling activities, and this proposed amendment will significantly exacerbate this problem. The DEQ is apparently failing to protect natural resources that may depend on or interact with the lake. This includes not only fish but other aquatic organisms. As for the DNRE's earlier statement – *"As a consequence, the limited fish community will not be protected"* – does DEQ believe their failure to protect natural resources is limited to the HTDF's fish community? "Under the law of this state, although the riparian owner on an inland lake or stream owns the soil under the water, he does not own the navigable water, *and he does not own the fish. So far as they are capable of ownership, they belong to the state for the benefit of the people."*

Which segments of the surrounding ecosystem are being protected from the degraded water quality of the pit? Are migrating birds prohibited from landing on the surface of the lake, or feeding in the lake? Are small mammals such as muskrat found within the Humboldt Pit, as was recently reported? Are turtles and frogs found within the pit waters? None of this is mentioned in Lundin's amendment request. These questions should be addressed by an updated EIA.

According to the Humboldt Mill's annual reports, there is a heron rookery of more than a dozen nests, located on the Company's property, just east of the Humboldt Mill. There is also an active Bald Eagle nest on their property. According to the Mill's 2016 Wildlife Species Assessment report[5] : "The bald eagle nest on the north shore of Lake Lory was occupied by two adults and two juveniles over the course of May and June, 2016 (Fig. 1-3). In June of 2016, approximately 17 nests were identified in the great blue heron rookery just to the north of Lake Lory."

Heron and eagles feed extensively on aquatic organism, including fish, frogs, turtles and muskrats. Bald eagles were federally delisted in 2007 but remain protected under the Bald and Golden Eagle Protection Act, the Lacey Act and the Migratory Bird Treaty Act of 1918.[6] The federal Bald and Golden Eagle Protection Act "provides for

[4] Phone communication between Kathleen Heideman of Mining Action Group and Melanie Burdick of EPA.
[5] 2016 Wildlife Species Assessment, Humboldt Mill, Eagle Mine LLC January 2017, provided by CEMP.
[6] U.S. Fish & Wildlife Service, Florida Migratory Bird Field Office. https://www.fws.gov/floridacaribbeanwildlife/

the protection of the bald eagle (...) by prohibiting the "taking" of the birds, and the definition of "take" includes "poison, wound, kill (...) molest or disturb (16 U.S.C. 668c; 50 CFR 22.3).[7] Herons are protected by the federal Migratory Bird Treaty Act of 1918, under Fish and Game Code 3513. According to the Animal Legal Defense Fund, research shows that herons play an important role in the health of local ecosystems *"by eating primarily the diseased and weakest fish near the surface of the water."* [8] The State of Michigan acknowledged the presence of fish in the HTDF as of 2009, stating "It currently has a very limited fish population (mostly minnow species) due to low pond productivity and lack of littoral habitat." Explain how herons and eagles are being protected from accidental poisoning from organisms (like minnows or frogs) living in and near Humboldt Pit.

DEQ's Regulatory Failure to Protect Water Quality in Humboldt Pit Lake

As defined in NREPA 324.3106 Establishment of pollution standards; permits; determination of volume of water and high and low water marks; rules; orders; pollution prevention. "The department shall issue permits that will assure compliance with state standards to regulate municipal, industrial, and commercial discharges or storage of any substance that may affect the quality of the waters of the state. The department may set permit restrictions that will assure compliance with applicable federal law and regulations (...) The department may promulgate rules and issue orders restricting the polluting content of any waste material or polluting substance discharged or sought to be discharged into any lake, river, stream, or other waters of the state. The department shall take all appropriate steps to prevent any pollution the department considers to be unreasonable and against public interest in view of the existing conditions in any lake, river, stream, or other waters of the state."

As promulgated in Part 632 R425.206, Amendment of Permits, the DEQ has a statutory requirement under Section 324.63207 (6)(c) of Part 632 to "submit the request for amendment to the same review process as provided for a new permit application." The DEQ has not met this requirement.

- Lundin Mining's "amendment request" is essentially a letter, containing unsubstantiated assertions.
- The applicant has provided NO revised environmental impact assessment (EIA) evaluating the substantial changes they are requesting, as required by R 425, Rule 206(1)(a).
- The applicant offers no revised environmental protection plan or contingency plan, as required by Rule 206(1)(b) and (c).
- No additional financial assurances have been outlined, as required by Rule 206(1)(e).

The permit amendment request describes an unsupported scenario, backed only by the assurances of Lundin's geochemistry consultant, Devin Castendyk, in an optimistic presentation titled *"From open pit mine to flooded pit to tailings disposal facility to post-closure integrated watershed feature: learn about the physical and chemical processes currently used at the Humboldt Tailings Disposal Facility, located in Champion, MI, and the* ***monitoring*** *approach used by Eagle Mine and the* ***science*** *behind how the facility will be closed without the need for long-term maintenance."*[9]

We conclude:

- Neither monitoring data nor scientific rigor were used to support this permit amendment request.
- Because geochemical data supporting Castendyk's presentation has not been provided, it cannot be reviewed by the public and therefore cannot be accepted as supporting evidence for the amendment application by the DEQ.
- Nothing in the permit amendment explains how a waste "facility" not protected by the Clean Water Act will be transformed into a "post-closure integrated watershed feature."

We strongly suspect that the company's unsubstantiated assurance that the lake can be filled nearly to the brim with toxic mine waste, then closed "without the need for long-term maintenance", is simply an attempt by Lundin to simplify and streamline the permit approval process, allowing the company to avoid responsibility for problems

[7] https://www.fws.gov/midwest/eagle/protect/laws.html
[8] http://aldf.org/press-room/press-releases/aldf-wildlife-emergency-services-offer-6050-reward-for-information-leading-to-arrest-and-conviction-in-shooting-of-great-blue-heron/
[9] http://eaglemine.com/hostcommunityforums-2/

that may well occur long after the facility is closed. Neither the DEQ nor the EPA can provide a clear vision for how the Humboldt Pit Lake will function in the watershed post-closure, and which "designated uses" (if any) it may hope to attain.

Humboldt's future remediation phase and the ecological function of the HTDF appears to be vague and hypothetical. Relevant corollaries for such a lake simply do not exist. We request that the applicant present a clear and detailed remediation plan at this time, revised to reflect the addition of Eagle East, detailing how the lake will function, and specific water quality benchmarks anticipated at each phase of reclamation.

Proposed Amendment is Not Limited to "Condition F.4" Alone

The proposed "significant change" to the Humboldt Pit Lake will impact other Special Permit Conditions not mentioned in the amendment request, including studies listed under **Section F, HTDF:**

> **F.2.** The permittee shall base the design of the Water Treatment Plant on a **worst-case prediction of metal concentrations in the HTDF. This would include a prediction based on the long-term build-up of metals in the bottom waters without invoking the various chemical processes (e.g. oxidation-reduction, metal scavenging, particle settling) that are currently used in the HTDF Model to control metal concentrations.** The permittee shall initially use these predictions to decide how long treatment of the HTDF water would likely be required. The permittee shall, prior to tailings deposition, conduct a sediment trap study to assess the importance of metal scavenging in the HTDF. Three sediment traps are to be installed in the water column at -15 m, -35 m and -55 m to determine the particulate flux to the floor of the HTDF. Sediment trap samples will be analyzed for total dry weight flux, total organic carbon and total metals.

Clearly, Condition F.2 needs to be amended and updated. The Humboldt Water Treatment Plant, which now requires the additional use of reverse osmosis technology, was inadequate for new variables in their "worst case prediction" and Lundin describes it as being at capacity. The fact that it is "at capacity" is a clear admission that it will not have the additional capacity, without WTP amendment, to handle water treatment with increased metals and TDS, displaced by treatment tailings disposal to the pit.

In addition, the following Conditions and Special Conditions of the Humboldt Mill permit appear to be impacted by the proposed permit amendment request, and should also be amended, made subject to public comment, and updated:

Permit Condition J Monitoring 14 (f) Aquatic Biota Sampling and 14 (g) Fish Tissue Sampling – these conditions should be updated to include at least two monitoring points within the HTDF; sampling and the publication of biomonitoring results should continue through the Reclamation period and Post-Closure:

> f. Aquatic Biota Sampling: The permittee shall continue to monitor and assess the fisheries, aquatic macroinvertebrate communities, and aquatic habitat at currently selected baseline monitoring locations and at acceptable control sites. A long-term aquatic sampling plan including a description of proposed control sites, sampling methods, and a standardized monitoring schedule should be submitted for approval.
>
> g. Fish Tissue Sampling: The permittee shall continue to monitor and assess selenium and mercury concentrations in fish muscle tissue at currently selected baseline monitoring locations and acceptable control sites. A description of proposed control sites, sampling methods, and a monitoring schedule should be provided. In addition, fish liver samples from control and potentially impacted sites should be analyzed for selected metals.

Permit Condition J Monitoring 22 – this condition should be updated for greater clarity and transparency to require the permittee to make their "ongoing characterization of the geochemistry" of "HTDF" tailings available for independent and public review.

> 22. The permittee shall conduct ongoing characterization of the geochemistry of the tailings throughout the milling operation to be used in calibrating and adjusting the model and predictions of potential generation of acid, dissolved metals, and other related substances.

Information shared by Lundin Mining during a private meeting with stakeholders[10] make it clear that Humboldt's Water Balance calculations continue to change, while recent conversations with DEQ and EPA staff make it clear that the "predictions to decide how long treatment of the HTDF water would likely be required" are now in flux. <u>These fundamental uncertainties need to be answered before an amendment is granted.</u> Changes to these special conditions of the Part 632 permit must also be reviewed, opened to public comment, and amended as needed.

Special Condition F Humboldt Tailings Disposal Facility 2 – this condition should be updated to reflect recent modifications, since the Water Treatment Plan has been (already) been redesigned, to clarify whether "worst case" conditions for water treatment at the WTP (mixed conditions) are now the "normal" or "predicted" conditions of the HTDF, and to specify the applicant's proposed new "treatment" method (pulling water from the hypolimnion for treatment, with wastes being re-injected back into the HTDF, and to clarify, **using their updated HTDF Model predictions,** exactly "how long treatment of the HTDF water would likely be required.":

Special Condition F Humboldt Tailings Disposal Facility 9 – this condition should be update to reflect the current fate of treated wastewater discharges from the Humboldt Mill. Condition F 9 is deprecated, since Wetland EE is no longer the only NPDES outfall receiving discharges. Condition F 9 should be revised to reflect the current use of Outfall 002:

> 9. The permittee shall monitor the effectiveness and integrity of the containment wall in terms of hydraulic containment throughout the operating life of the WWTP by collecting the following information and data:
>
> a. Continuously monitor water levels in wells identified in Special Permit Condition J-8, Wetland EE, and the HTDF and compare them to the predicted water levels identified in Special Permit Condition F-5(b).
> b. Collect quarterly water quality samples from wells identified in Special Permit Condition J-8 and Wetland EE and compare to water quality in the HTDF to determine if there is a correlation between HTDF and up gradient groundwater chemistry and down gradient groundwater chemistry.
> c. Update the water balance model quarterly to more accurately bracket seasonal variations and limit the uncertainty in the predicted groundwater levels in Special Permit Condition F-5(b). Model input data should include but not limited to the following:

Shallow Water Cover: Wind Mixing of Pit Waters

The proposed amendment, if granted, would create a shallow pit environment, rather than the deep subaqueous tailings facility that was initially proposed. On page 5 of the application the company states that "Tailings peaks are calculated to reach an approximate maximum elevation of 1515 ft MSL, providing a **reasonable water cover of approximately 20-25 ft at closure."** The significant reduction in the depth of the proposed water cover – from **at least 95 feet of water cover** to a planned 20 feet (Application, p. 6) and as little as 10 ft at the peaks of the tailings "cones" - greatly increases the likelihood of fully-mixed pit waters (not seasonally stratified waters) becoming the normal condition of the lake.

[10]Meeting on June 9th, 2017 with Lundin's staff at Humboldt Mill offices: "private meeting with us (stakeholders) to *discuss the process of modeling the pit (past, present, and future), TDS, discharge proposal, etc."* (coordinated by CEMP). Participants included stakeholders from UPEC, MAG, KBIC, and Concerned Citizens of Big Bay.

This major change in water dynamics represents a significant departure from conditions assumed in the Humboldt Mill's original permitting review. In the State of Michigan's "Compiled Responses to Public Comments Regarding the Permit Applications and Related Regulatory and Administrative Concerns About the Proposed Kennecott Humboldt Mill Project" (2009), for example, concerns about the potential for "turnover" was answered by DNRE as follows:

> 26. **Comment:** "Turnover" of water in the Lake was not considered in the EIA, even though DEQ itself has identified that as an issue. The company is relying on chemical and thermal stratification of the water and apparently plans to treat only the uppermost portion of the Lake, relying on stratification completely and forever. This sets a precedent of allowing deep water bodies to be polluted at the bottom, if water at the top is purportedly clean. This negligent approach to water quality flies in the face of the letter and spirit of Part 632, the Clean Water Act, and other applicable laws.
>
> **Response:** The HTDF is currently chemically and thermally stratified with anoxic conditions that allow the hypolimnion to be chemically different than the above surface waters. The EIA describes a fully mixed scenario. The results of the fully mixed scenario were used as design criteria for the WWTP. In addition, an independent consulting firm, retained by the DNRE, with expertise in subaqueous tailings disposal, concluded the HTDF could be successfully used as a disposal facility. Furthermore, the HTDF has been determined to be a mine disposal treatment pond for the purpose of compliance with water quality standards and will be regulated as such.

Regulators stated clearly that the "HTDF is currently chemically and thermally stratified with anoxic conditions..." and that the wastewater treatment plant was designed to handle the "fully mixed scenario" (worst case scenario planning). According to the DEQ's unscheduled "NPDES Reconnaissance Inspection" report for the Humboldt Mill (8-31-17), Lundin Mining staff blamed a spring wind storm for water quality problems related to the water treatment plant: "Various potential sources (water chemistry of the Humboldt Tailings Disposal Facility HTDF, treatment chemicals, treatment units, and use of RO system) were evaluated using water chemistry, toxicity and jar testing, and historical data assessment for trends. The HTDF water chemistry changed during a turnover event in early April bringing up reduced water that dissolved iron and manganese. This decreased the treatment efficiency for nickel and was the source or significant contributor to the toxicity observed."[11]

Clearly, the wastewater treatment plant was NOT designed to handle the mixed scenario, since the company has been required to augment the treatment with reverse-osmosis technology, and is contemplating additional measures, not yet detailed in any permit application, to handle the increasing TDS problem.

In the permit amendment request, under "closure and reclamation" (p. 11) the company states without providing evidence that "seasonal stratification and turnover" will occur, creating a shallow, dimictic lake in which the bottom material is regularly exposed to oxygenated water. With a maximum depth of around 20 ft, this lake is very unlikely to develop seasonal thermal stratification, as the applicant is claiming. Data from a study of the stratification of 500 Wisconsin lakes indicate that a lake of 67 acres (27 hectares) and 20 ft deep (the claimed final dimensions of the HTDF) would be HIGHLY UNLIKELY to ever thermally stratify.[12] Instead, wind mixing will occur throughout the open-water season, creating acidification, and causing the liberation of dissolved toxic metals from the oxidation of sulfide metallic minerals of toxic metals from bottom sediments.

Apparently even the company doesn't believe that chemical stratification can be relied on to maintain anoxic conditions above the tailings anymore: Lundin's health, safety and environmental manager Amanda Zeidler was recently quoted as saying that, "As we continue to add tailings and processed water to the pit, this chemocline is

[11] Eagle Mine LLC-Humboldt Mill : 116297 NPDES - Reconnaissance Inspection

[12] Lathrop, R. C. and R. A. Lillie. 1980. Thermal stratification of Wisconsin lakes. Wisconsin Academy of Science, Arts and Letters 68: 90-96. See Figure 2. http://images.library.wisc.edu/WI/EFacs/transactions/WT1980/reference/wi.wt1980.rclathrop.pdf

actually moving up, so, as it moves up, there's more chance of it to turn over."[13] So frequent mixing should be considered to be the typical future condition of the lake in the permit amendment application.

Potential corollary lakes presented as "similar to Humboldt Pit Lake" by Dr. Castendyk are in fact wildly different: Green Lake, NY (a natural meromictic lake that is 195' deep with no seasonal mixing, much deeper than Humboldt's closure depth); Portsmouth Mine Pit Lake, MN (abandoned iron mining pit adjacent to an iron sintering mill, 450' deep, used for "public recreation" such as fishing and a "Designated Trout Lake" despite legacy environmental issues "involving the fine grained materials from former mines... this fine grained iron rich material erodes easily, causing significant shoreline loss and water contamination issues around former mine pit lakes. Efforts at planting and managing trees along these shores is an ongoing challenge"[14]; Falconbridge, Ontario (much of the data for this tailings facility, which was extensively limed to neutralize the water, and filled in sequential cells, is proprietary and unpublished, but water contamination threats appear to be significant) ; and Island Copper's Pit Lake on Vancouver Island (531 acres, remediated using diverted sea-water to fill the copper mine pit, creating "anoxic bottom waters into which the acid rock drainage could be injected and neutralized" under a freshwater cap that was breached by an upwelling saltwater plume). Each lake clearly presents a uniquely different scenario, and none closely matches the conditions, size, and tailings characteristics faced at the Humboldt Mill. It should also be noted that some of these corollaries continue to face their own unresolved reclamation problems. The Falconbridge pit lake, for example, has an extremely low pH; the Island Copper discharge remains actively managed.

For its static column tests the company assumes that this lake will thermally stratify, and that "Turnover of the upper surface layers would occur annual (sic) during regional lake turnover cycles in Conceptual Model 1." This assumption is almost certainly false, invalidating the conclusions of their earlier model.

At one of Lundin's Community Forums (Spring 2017) Kristen Mariuzza stated that significant wind mixing had taken place during a straight-line wind event in March or April of 2017. This wind event, while reaching high sustained speeds, was largely from the west. What are the anticipated impacts of wind-mixing from storm events on the pit, especially storms where sustained winds blow across the full length of the Humboldt Pit Lake?

Humboldt's Mine Permit must be revised to, at a minimum, to add monitoring for wind-mixing and high-wind events, in light of the long-term shallow water cap, and the obviously increased potential for wind-mixing events to distribute contaminants throughout the water column. Additionally, if the water cap is diminished, the use of best management practices for wind-mixing impediments on tailings ponds (such as booms, or sequential compartments) should be evaluated. These management methods are routinely implemented on mine tailings basins, including the ones apparently studied by Lundin's geochemistry experts.

Requested: Clarification of Stratified Model Prediction v. "Turnover" (Mixing)

Stratified pit waters: that was the confident modeling that the HTDF permit was based on. The company's modeling predicted a deep lake, with layers confined by the chemocline and thermocline, strictly limiting the exposure of tailings to oxygenated water. In a Spring 2017 meeting of the Upper Peninsula Environmental Stakeholders Group, however, Joe Maki and Steve Casey stated categorically (to the astonishment of many in the room) that the "Humboldt Pit is turning over – yes, it's turning over." This statement by DEQ regulators alarmingly and directly contradicts a statement in the Humboldt Mill's 2016 Annual Report: "Throughout 2016, the HTDF continued to be stratified." Is the Stratified Model, the basis of the Humboldt Mill permit, untrue? Do the DEQ permitting staff fully understand the modeling that was offered as the scientific basis of the HTDF permit, and the potential for adverse impacts, related to the changing model?

[13] Bleck, Christie. November 7, 2017. Changes coming to facility tailings disposal site. Marquette Mining Journal, page 1. http://www.miningjournal.net/news/front-page-news/2017/11/changes-coming-to-facility-tailings-disposal-site/ (December 26, 2017).
[14] https://www.industriallandscapes.org/ghost-plants/portsmouth-sintering-plant-crosby-mn

7.6.4. Geochemistry Program

Eagle continued implementation of the comprehensive HTDF geochemistry monitoring program which had been prepared by Hatch Associates in 2015. The monitoring program was used to further understand the relationship between HTDF geochemistry and the tailings composition, as well as monitor seasonal changes in HTDF properties. Geochemical models were updated to further refine the predicted changes in water quality during operations and in closure, which was used to facilitate planning for near- and long-term water treatment solutions.

Throughout 2016, the HTDF continued to be stratified. As previously experienced, in the spring and fall there were thermodynamically driven shallow mixing events. Metal concentrations of the WTP influent continue to oscillate seasonally in sync with these events, but remain at levels that are within the treatment capacity of the water treatment plant. As anticipated through geochemical modeling, dissolved solids loads within the HTDF continue to rise and approach limits of the site's NPDES permit. As such, water treatment capacity has been added to remain in compliance with the dissolved solid limit (i.e. reverse osmosis). Eagle is undertaking other pilot studies and complimentary management approaches to assure compliance with the effluent discharge limits.

Tailings Basin - Eddy Diffusion Modeling Needed

According to research conducted in corollary pit lakes used for subaqueous disposal of tailings: "Field observations provided the basis for a numerical model designed to quantify the vertical mass flux of material initially injected at the base of the water column in a small lake; a process called subaqueous disposal. Eddy diffusion estimation largely controlled the transport behaviour, highlighting the need for measurements of diffusion in deep strongly stratified environments. The model followed the contaminant development over 40 years and showed that (i) it is unlikely that any material can ever be completely disposed of over realistic scales and (ii) within the bounds limited by uncertainty in eddy diffusivity, turnover penetration and surface layer precipitation-driven flushing are the mechanisms most likely to have bearing on the contaminant distribution." No information has been provided in the amendment request as to eddy diffusion and its potential impacts on the future water quality of the pit, including the long-term potential for transport of contaminants.

Effectiveness of "Subaqueous Tailings Disposal" Method Disputed

Kennecott's original 2008 permit application for the Humboldt Mill[15] includes a number of statements about the importance of maintaining a stratified lake. On page 1, for example, the company states that, "Tailings from the mill operation will be placed in the existing HTDF, an anoxic environment to control oxidation of the sulfide tails." This is followed by "To eliminate the potential for the sulfides in the tailings to oxidize, the tailings generated from the milling process will be placed in the anoxic environment that exists in the HTDF." (p. 25) and "Placing the tailings at the base of the HTDF will minimize potential oxidation of the tailings thereby minimizing long term impacts on the quality of water discharging from the HTDF." (p. 26). And on page 10 the company states that, "The geochemical testing includes industry standard mineralogical tests and static testing programs to assess the potential acid generating characteristics of the tailings. Based on these test results, the appropriate method for long term storage of the tails is subaqueous deposition in the deep anoxic environment of the HTDF." Yet the current amendment application for the mill claims that stratification and anoxic conditions over the tailings are no longer needed.

While not clarified in the permit amendment application itself, it is becoming clear that Lundin's current method of tailings treatment (tailings stored under a deep cap of water) is not working effectively, and that pit conditions have deviated significantly from what was originally permitted. The "deep water cap" was a specific solution used in their original modeling, in order to reassure the public, and avoid conditions which could lead to what was

[15] Foth Infrastructure and Environment, LLC. December 2008. Humboldt Mill Kennecott Eagle Minerals Company Mining Permit Application. 60 pages.

considered a “worst case scenario” – the complete mixing of oxygenated and anoxic levels leading to the production of Acid Mine Drainage (AMD), the potential need for long-term water treatment, and the DEQ’s regulatory obligation to avoid creating a perpetual care situation. Humboldt Mill’s original mine permit application, MPA (Vol. I, App. D, p. viii), acknowledged the potential for at least 7 years of post-closure treatment of the HTDF. No upper limit on treatment time was given. How long is post-closure water treatment expected to last?

Accuracy of Data and Models

The public has been asked to trust that the company’s original modeling remains accurate and scalable, despite the SIGNIFICANT ADDITION of all of Eagle East’s tailings to the pit. In light of the company’s claim (amendment application, p. 4) that “Eagle conducts regular bathymetric surveys of the HTDF, in accordance with its Part 632 permit, to assess the deposition and consolidation of tailings in the HTDF.”, why was the company unable to accurately anticipate and correct for the inconsistent placement (voids and peaks) of tailings? Why did the company’s original HTDF modeling **fail to anticipate** the uneven deposition of tailings (peaks and voids) which required the revision of their Part 301 permit in April 2017, increasing the permitted vertical elevation of tailings by 20’? Why wasn’t their proposed strategy of using “a floating barge(s) positioned across the HTDF... repositioned as necessary to reduce tailings deposition mounding on the HTDF bottom.”[16] implemented? According to Lundin staff, there have been **additional changes** to the inputs used in the HTDF’s Water Balance diagram. The Water Balance inputs were previously revised during a NPDES permit amendment, as well. Why – given the strong reliance upon Water Balance in the original Part 632 and NPDES permit – have the Water Balance inputs for the Humboldt Pit Lake been repeatedly miscalculated?

The Amendment Request makes broad and mostly unsubstantiated statements concerning lack of environmental impacts from the addition of Eagle East tailings, and does not include any supporting documents except two pages from a Bathymetry report.

Failure to Disclose Pit Data

Pit modeling and water quality sampling data has been requested by UPESG group members and by CEMP. Data was requested in writing; verbal requests were made at the Eagle Mine Community Forum held in Humboldt Township; requests were made during a private meeting at Humboldt Mill with environmental stakeholders; request for data was repeated during a recent lecture by Devin Castendyk, a geochemist working for Hatch Consulting. Lundin’s ongoing refusal to provide publicly-reviewable HTDF data remains deeply troubling. According to the Humboldt Mill’s 2016 Annual Report, plenty of data has been gathered, including:

- Comprehensive HTDF geochemistry monitoring program (begun by Hatch)
- Relationship between HTDF geochemistry and tailings
- Seasonal changes in HTDF properties
- Geochemical models were updated to “refine predicted changes”
- (and) *“Eagle is undertaking other pilot studies”*

None of these key reports were provided in support of Humboldt’s permit amendment.

According to the company, three (3) Bathymetry surveys were conducted in 2016, and Water Balance models were updated, including significant changes to total water inputs. **Only 2 pages of the Amendment Request show bathymetry diagrams.** Why did the company fail to provide any “geochemistry monitoring” data or “geochemical modeling” data in support of this significant permit amendment? Why did they fail to provide the “three (3) Bathymetry surveys” or the new “Water Balance” diagram?

When concerned citizens requested access to review the pit monitoring data (water quality at depth), Kristen Mariuzza replied “what is your motivation in seeing the data?” A similar response was given during a private meeting on Humboldt Pit Lake, with Lundin staff. The applicant has failed to support their “Significant Change” request with pit data, geochemistry reports, or modeling. They failed to make this information available to environmental stakeholders and refused multiple requests for the data. This is unacceptable stewardship behavior.

[16] Foth Infrastructure and Environment, LLC. December 2008. Humboldt Mill Kennecott Eagle Minerals Company Mining Permit Application. 60 pages. See p. 26.

The existing water quality of the Humboldt Pit Lake is not being publicly disclosed. Lundin Mining is refusing to provide data on conditions in the pit to the Superior Watershed Partnership for its Community Environmental Monitoring Program (CEMP), as the company's predecessor Rio Tinto had agreed to do. For this reason alone the permit should be denied until the company provides the data to CEMP.

Mill Waste: Failing to Recover Significant Quantities of Toxic Metals

According to the 2016 Humboldt Mill Report, "The Metallic Minerals Lease (No. M-00589) requires the lessee to furnish a mill waste reject report on an annual basis. In 2016, 3,858 dry metric tonnes of nickel and 598 dry metric tonnes of copper were deposited in the HTDF as tailings." At the current (11-13-17 London Metals Exchange price), the LME rate for copper is $6,796 dollars per tonne, and the LME rate for nickel is $12,280 per tonne.**Is the company really flushing more than 4 million dollars of copper and 47 million dollars of nickel into the HTDF every year, unrecovered?** This seems both environmentally dangerous, given the toxic nature of the metals, and fiscally irresponsible. Clearly the accumulation of dissolved pollutants in the pit lake will only increase with the addition of Eagle East waste.

Water Balance Concerns

According to the 2016 Humboldt Mill Report, "The target operating water elevation of the HTDF is between 1529.5 and 1530.5 MSL which is significantly lower than originally planned during the permitting process. The lower operating level mitigates risks associated with overflow situations and provides excess capacity to manage various operational situations."

- Explain why the Mill's new Water Balance information, according to Lundin, compared with the Mill's existing diagrams, has radically changed? It appears that Water Balance estimates were significantly flawed, and underestimated in the original permitting process.
- Why was Water Balance info not included in the permit amendment request?

REQUESTS

Requested: Calculate the Actual Maximum Capacity of the HTDF as a "Tailings Storage" and "Treatment Facility"

Because the lower boundaries of the Eagle East have **not** been strictly defined, and because the company publicly acknowledges that they will "follow the orebody wherever it leads", it seems the company can't possibly know how much total additional waste material will be generated, nor how much additional tailings capacity the HTDF will require. In fact, Lundin's NI 43-101 document says "both permits were developed **before Eagle's total size was defined** and the permits **need to be revised to allow, at a minimum, the <u>entire volume of Eagle's tailings</u> to be placed in the HTDF.**"

In this statement, "Eagle's tailings" means the combined tailings from BOTH Eagle and Eagle East orebodies, since they are to be commingled during milling to enrich and extend the mill's profitable production years. To be clear: that's crazy. That's like saying *"I bought my kid a pair of shoes before I knew the full size of his feet, yet now, a few years later, I am demanding that the shoes must, at a minimum, allow his entire feet to be placed within them."*

The shoe (Humboldt Pit) is a container, and has a finite capacity. If Eagle Mine's environmental footprint continues to grow, the Part 632 permit need not burst at the seams trying to contain all of Eagle's growing waste; the HTDF permit need NOT be revised to accommodate the bottomless desire of industry at the expense of the state's natural resources. What will happen if Eagle East is found to be larger than currently known? What will happen if Eagle North or Eagle South is also broadly defined as "Eagle" waste?

Clearly, Eagle Mine failed to anticipate their waste disposal needs, and/or failed to disclose the full extent of their mining plans during the initial permitting, or found something new and profitable, Eagle East, a different orebody,

wholly beyond the legal scope and limitations of the initial Mill permit. The Humboldt Mill permit need not fix Lundin's waste problem.

No Feasible Alternatives Analysis?

Lundin's 2016 Technical Report (NI 43-101) also states: **"In the event that modelling of the HTDF size does not support placing the entirety of Eagle East's tailings, <u>other tailings storage facilities will be necessary, and Eagle Mine is investigating those options.</u>"**

Have additional storage sites or methods of handling (such as dry-stacked tailings) been considered? For the sake of full disclosure, which other facilities/sites are being investigated by Eagle? What are the "innovative tailing solutions" being studied by the company? Why was the Inland Lakes and Streams Permit modified to accommodate Eagle Mine's poor tailings modeling, without public comment, in light of the fact that permit amendments are being sought that will also have a dramatic impact on the pit? Why did the company's modeling fail to predict the uneven placement of tailings? The DEQ's rapid approval of Eagle Mine's 2017 Inland Lakes and Streams permit modification request –without public input – is egregious. The letter requesting the permit change fails to acknowledge that additional tailings storage will be also sought through a Part 632 amendment. The quality of the files included in the Part 301 permit amendment request was so poor that text on diagrams of the HTDF was unreadable.

Tailings Characterization and HTDF Capacity not Independently Verified

According to Lundin's 2016 Technical Report (NI 43-101), page 217:

> "Tailings storage is limited by two permits:
>
> 1. Part 632 Mining Permit for tailings not to exceed elevation of 434 MASL.
> 2. Part 301 Inland Lakes and Streams Act Permit to fill the HTDF with 1.83 million m^3 of tailings to a maximum thickness of 23 m.
>
> Both permits were developed before Eagle's total size was defined and the permits need to be revised to allow, at a minimum, the entire volume of Eagle's tailings to be placed in the HTDF.
>
> Eagle will need to apply for an amendment to the Humboldt Mill Part 632 Mining Permit to allow for the additional placement of tailings. The studies and work required to obtain this modification have been initiated as the Eagle Mine has already identified that it will need an amendment to complete mining of the Eagle orebody.
>
> The permitting strategy is to use geochemical models and the results of column studies, designed to understand the leaching rate of the tailings, to support a permit for the maximum storage volume of the HTDF, up to the 1,520 ft level which is 10 ft (3 m) below the closure water level of the HTDF. **Eagle anticipates that the MDEQ will conduct third party review of the request.**
>
> In the event that modelling of the HTDF size does not support placing the entirety of Eagle East's tailings, other tailings storage facilities will be necessary, and Eagle Mine is investigating those options."

Where is the applicant's report, showing their updated understanding of the "leaching rate of the tailings"? Why did Lundin expect the DEQ to conduct a third party review of the amendment request? If this was discussed, did MDEQ fail to pursue independent review? According to DEQ's response at the November 27th Public Meeting, "NO independent third party review of the amendment request" is being conducted. Why does the application use a different figure for the depth of the final water cap – 15-20' – rather than the "10 ft (3 m) below the closure water level of the HTDF. Is the closure water level of the HTDF proposed to change? These questions need to be answered before the current permit amendment is approved.

Requested: Special Condition Monitoring for Uranium

We are concerned that the Humboldt Mill permit does not include monitoring for uranium. Uranium is found in rocks of the Baraga basin; where Platinum Group Elements are found, along with nickel and gold, **uranium may**

also be present. Uranium is specifically known[17] to be found in the "country rock" hosting the Eagle intrusions, variously referred to as sedimentary rock, bedrock, host rock, Michigamme formation, slate, Huron River Uranium Prospect, etcetera. According to the original Eagle Mine permit application (Volume IB, Appendix D-1, "Phase I 1 of 3.pdf" p. 76 of 193, "Elemental Analysis – Uranium") geochemical analysis determined that sedimentary rocks hosting the Eagle orebody contain elevated levels of uranium. This is especially true of Argillite, "a compact rock, derived either from mudstone (claystone or siltstone), or shale, that has undergone a somewhat higher degree of induration than mudstone or shale but is less clearly laminated and without its fissility, and that lacks the cleavage distinctive of slate."[18]

Uranium was identified in Eagle Mine's TDRSA sump water in 2013, and Eagle Mine's Groundwater Discharge Permit #GW1810162 was subsequently amended to include uranium limits, as follows:

> *9. Other Conditions (f) Uranium Notification: "Should uranium levels in the effluent reach or exceed 5 ug/l, the permittee must notify the Department within 24 hours, and within seven days submit a report indicating the source of the uranium and describe the steps taken or to be taken to reduce or eliminate the source. The Department may modify the uranium monitoring requirements of this permit, and may require additional activities to address any exceedance of applicable standards for uranium.*

Because of the presence of uranium in the Eagle commingled ore, we request that a similar "Special Condition" for uranium monitoring limits be added to the Humboldt Mill permit, specific to **influent** – water pulled from the Humboldt Pit Lake for treatment. Elevated uranium levels should be identified within influent, rather than effluent, to avoid unnecessary exposures in the Wastewater Treatment Plant, or environmental releases. We ask that uranium monitoring be added to the (anticipated) NPDES permit, as well. The Humboldt Mill permit should be revised to contain a Special Condition establishing a strict limit for uranium and monitoring/notification protocols, in order to protect worker safety and environmental safeguards.

Requested: Humboldt Air Permit Revision

As happened at the Eagle Mine MVAR site, Humboldt Mill's air permit only included a one-time monitoring of particulate matter (PM). This seems inadequate, given the serious concerns raised about increased quantity of heavy metals in the Eagle East ore stream, in addition to PM hazards. Nickel and copper, both primary contaminants of concern, are found in *significantly higher grade in the Eagle East ore,* which will be commingled with the Eagle ore during the life of the Mill.

Recent studies in Michigan show a correlation between poor communities, PM emissions (sometimes too small to be regulated properly by air pollution permits) and death rates among older residents. We ask that any amendment of Humboldt Mill's Part 632 trigger an additional air quality monitoring test, confirming the

Requested: Shifting "Life Of Mine" Estimates Require a Revised Mining Permit and EIA

Lundin's shifting "life of mine" calculations for the Eagle / Eagle East mine make it difficult to assess the true extent of environmental impacts. The "life of mine" calculation affects critical portions of the EIA, as it directly relates to the total impact the mine will have on the environment. While the permitting process considers the "ore" under a different EIA, the addition of Eagle East ore is of critical concern to the Humboldt Mill permit amendment request.

Under Part 632, "The application shall include revisions of any of the following that are affected by the changes: (a) The environmental impact assessment. (b) The mining, reclamation, and environmental protection plan. (c) The contingency plan. (d) Federal, state, and local permits and licenses that are anticipated to be required. (e) Provisions for financial assurance required under R 425.301. (f) Other terms and conditions of the mining permit."

Previously, Lundin stated that mining "Eagle East" would extend life of Eagle Mine by **one year.** In the Mining Action Group's review of the Eagle East amendment, we expressed concern that this statement had been changed to *"Eagle East can extend the estimated mine life of the Eagle Mine by **two years** to 2023."* Since then,

[17] Both the Stratus and Geochem reports on Eagle orebody agreed on this point.
[18] https://www.mindat.org/loc-208081.html

the permit amendment for Eagle Mine has been approved, authorizing the extraction of the Eagle East orebody, yet the "life of the mine" question has been sidestepped. Lundin Mining's President Paul Conibear recently stated that the company's "key objective here is to lengthen the life of mines (...) right now the overall life of mine for Eagle Mine is eight years, and our objective is to extend that as long as we can and be here for two decades if we can." Clearly, the extent of Eagle East is undefined, and may pose a more significant tailings waste management problem than currently understood. After all, the company is not proposing to mine more slowly – they are proposing to find and extract further ore, and create additional tailings waste.

Is Eagle's increased "life of mine" expected to increase the operational life of Humboldt Mill by one year or two years — or 10? The DEQ's Steve Casey recently suggested that the closure and reclamation plan may need to be extended or deferred by additional seven years. Exactly how will the remediation and closure timeline be revised? We are deeply concerned that Lundin's definition of what constitutes "Eagle ore" and the resulting quantities of Eagle "waste" tailings will continue expanding. **Only one thing is clear: Lundin insists that Humboldt Pit Lake must accept ALL of Eagle's tailings, which now includes Eagle East.** They claim this can be done "safely" but have failed to provide the supporting evidence – and they have failed to quantify how much waste will be generated by Eagle East addition.

In light of the DEQ's recent approval of the Eagle East permit amendment, we ask that the Humboldt Mill's EIA be fully reconsidered, in order to quantify waste, assess the indirect effects and cumulative effects, and revise the Humboldt Mill reclamation timeline. How many tons of additional tailings will be added? The applicant fails to make this clear.

We are concerned that the addition of an unspecified but large quantity of tailings waste, added to the Humboldt Pit Lake, may cause significant degradations of natural resources, including but not limited to: *groundwater impacts from the increasing TDS and metals content of the pit lake, impacts of a newly disclosed plan for direct discharge of wastewater to the Middle Branch of the Escanaba River, delayed remediation, increased risks to Migratory Birds and Raptors known to be in the vicinity of the Pit, and significant changes proposed to the method of mine tailings disposal and the depth of the post-closure water cap.*

Why did the applicant fail to provide updated EIA materials for the Humboldt Mill application, even as they were acknowledging "changing water chemistry" and planning significant changes to wastewater treatment and discharge? According to Lundin's 2017 Technical Report (NI 43-101), the Humboldt Pit Lake will *"allow storage of the Life of Mine (LOM) plan tailings" and "To mine and process the Eagle East material, a modification to the Mine Site Mining Permit will be required as well as amendments to the two permits limiting tailings storage at the mill site.* ***Updates to the Environmental Impact Assessment (EIA) have been identified,*** *as these will be required in conjunction with modifications to the Mine Site Mining Permit."*

Under Part 632 324.63205 (2)(b) *"An environmental impact assessment for the proposed mining operation that describes the natural and human-made features, including, but not limited to, flora, fauna, hydrology, geology, and geochemistry, and baseline conditions in the proposed mining area and the affected area that may be impacted by the mining, and the potential impacts on those features from the proposed mining operation. The environmental impact assessment shall define the affected area and shall address feasible and prudent alternatives."*

Where is the Applicant's "Feasible and Prudent Alternatives" Analysis?

Which additional sites, other than the Humboldt Pit Lake, have been considered for tailings storage? Which other tailings disposal methods, such as dry stack, were contemplated in this amendment request? In terms of the "potential impacts" on features, it should be "reasonably foreseeable" that the additional Eagle East ore will be "found" and that the Humboldt Pit Tailings Disposal Facility will be entirely filled by the resulting waste stream, effectively removing the Humboldt Pit Lake from the landscape. At the very least, the potential for this to occur, and the long-term impacts on the "affected area" (Escanaba River Watershed) should be fully considered. A complete alternatives analysis, required under Part 632, is needed.

HTDF Experiencing Radical Increase in Total Dissolved Solids (TDS)

Material coming from the “Eagle Mine” and “Eagle East” will be commingled and collectively called "Eagle" ore, but they have different geochemistry, different volcanogenic sources, differing metallic grades, the Eagle East deposit lies in the brine zone, and the extent of the Eagle East deposit is still being defined. Significant concerns related to the difference in ore are enumerated in Lundin’s 2017 Technical Report (NI 43-101), which states:

- “Brackish to saline groundwater in the underground mine becomes entrained in ore....the **TDS (total dissolved solids) of groundwater at Eagle East is higher than at Eagle, therefore, additional TDS loading will enter the mill process and tailings** (Hatch, 2016a). This will have the effect of **added TDS loading on the HTDF and require treatment through the WTP to meet the NPDES discharge limits.** A number of permit amendments are underway to address TDS limitations and other treatment options are being explored.

It is not clear, in this permit amendment request, what other “permit amendments are underway to address TDS limitations.” The applicant needs to clarify their response to TDS concerns, particularly in light of a “brine plume” which Castendyk described as bubbling up from the contaminated hypolimnion layer, rising through the pit, due to the discharge of warmer tailings water at the bottom, containing elevated salts and dissolved metals. This concern was not outlined in the permit amendment request.

It is clear that TDS levels in the pit are radically increasing. Currently, TDS levels are necessitating the use of Reverse Osmosis technology – “as needed in order to meet NPDES permit requirements” according to the Company – at Humboldt’s Water Treatment Plant (WTP). According to the Company, water discharged to adjacent wetlands is “monitored carefully.” *Has the Company’s monitoring data been independently reviewed – by DEQ, CEMP, KBIC or others?*

Increase in Total Dissolved Solids: Impacts to WTP, Impacts to Escanaba River

The removal of waste solids through crystallization will likely exceed the current Water Treatment Plant (WTP) capacity. Therefore, an additional crystallizer will be required to effectively manage Total Dissolved Solids (TDS) during all phases of the operation." This problem should have been anticipated by Lundin. The presence of entrained salts in the Eagle orebody was known.

Lundin has revealed – through one interview with the Mining Journal – that they intend to request a **direct discharge to the Middle Branch of the Escanaba River,** and a mixing zone, in order to have Water Treatment meet their permit conditions. The details of this anticipated NPDES permit amendment – another “Significant Change” – have not been revealed. This plan was also described in the notes of the DEQ’s unscheduled NPDES inspection on August 31, 2017: “The (NPDES) Permit modification application to add outfall location 004 in the Middle Branch Escanaba River and pump river water to maintain hydraulics in wetland EE was also discussed.” Since this change is tied to the increase in TDS, and Lundin’s request to add Eagle East tailings to the Humboldt Pit, these permits – NPDES, Humboldt Mill, minor permits for building pipelines or changes to the WTP – should be reviewed in a coordinated fashion. The DEQ does a great disservice to the public by treating these permits, and their environmental impacts, separately.

The Humboldt Mill’s permit amendment request pertains not to additional tailings waste of the same sort, but to Eagle East ore tailings, which are known to contain higher quantities of toxic metals and greatly increased quantities of entrained salts, due the orebody’s greater depth. It is reasonable to assume that the quantity of salts and toxic metals will both increase, per ton of tailings, under this permit amendment request. Where is the EIA that would show how the watershed will be impacted by a doubling of the total tailings deposited in Humboldt Pit, or the downstream environmental impacts, whether immediate or long term? Again, no EIA updates were provided.

Humboldt Pit Tailings Disposal Facility (HTDF): There are concerns re: the capacity of the Humboldt Pit. It is expected (with disposal method modifications) that the Humboldt Pit will be able to hold all of the Eagle East tailings. BUT this involves an enormous increase in the total amount of waste tailings that will be disposed of in the pit. The pit was designed to safely contain the waste using "subaqueous tailings disposal." The new plan:

"The ultimate pit capacity is expected to be 4.8 million m^3, with an allowance for a five metre water cap." This means, the pit will now be filled with tailings, leaving only a shallow cap of water. Since this is a permanent waste facility, we must ask whether the proposed change is environmentally safe?

Requested: Applicant Should Revise Closure and Reclamation Plans

According to the DEQ, "Reclamation is an important part of the mining process." The company's amendment request states: "Since there are no major updates to the reclamation plan needed to facilitate higher tailings placement, the closure and reclamation plans will be **updated as needed in the future.**"

We strongly disagree. We ask that the DEQ require Humboldt's Reclamation Plan to be updated immediately, accounting for:

- Extended operating life (1-3 years?, 10 years?) due to the addition of Eagle East orebody.
- Additional water quality impacts to Middle Branch of the Escanaba, and remediation of infrastructure additions, anticipated under NPDES permit
- Revised Timeline for Reclamation

The applicant failed to provide any meaningful updates related to closure and reclamation planning. This is inexplicable, given detailed information related to closure and reclamation disclosed in Lundin's 2016 Technical Report (NI 43-101), where they stated:

> Reclamation of the Humboldt Mill site will consist of decommissioning plant equipment and establishing a property end use that is consistent with local development plans. Procedures and expected timelines for closure are included with the Reclamation Plan, which consists of the following:
>
> - Decommissioning of plant equipment.
> - Removal of remaining chemicals/reagents on the property.
> - Demolition and/or removal of unwanted structures/buildings.
> - Re-vegetation of disturbed areas with natural vegetation.
> - Removal of HTDF control structures, including piping and the WTP (note that a sub-surface cut-off wall will remain in place after reclamation).
> - Establishment of passive water flow from the HTDF into local wetlands.
> - Post-closure monitoring of surface water and groundwater.
>
> Closure/reclamation of the mill will start when Eagle Mine ore processing is complete. The closure period is expected to last for four to five years, while the post closure monitoring period is anticipated to last for a further 20 years.
>
> The impact of an Eagle East extension on mine closure requirements for Eagle Mine and Humboldt Mill is discussed in further detail in Section 24 of this report.

The details of Lundin's reclamation plan appear vague, and timelines are uncertain. Humboldt's currently in-force permit states that a **"self-sustaining ecosystem"** will be created, during reclamation, but no details are provided:

N. Reclamation Plan

1. The permittee shall reclaim the Humboldt Mill Project Site at the conclusion of ore processing to establish a self-sustaining ecosystem in conformance to Rule R 425.204 and Rule R 425.407. The final land use of the site will be compatible with existing uses on adjacent properties.

2. The permittee shall, to the extent feasible, conduct reclamation activities concurrently with the milling operation, and in any event shall initiate reclamation activities at the earliest possible time after cessation of mining activities in any portion of the mining area. Reclamation activities shall commence during initial construction activities and shall continue through facility closure and the post-closure care period.

During a recent phone conversation, Melanie Burdick (EPA Region 5) stated she was "under the impression" that Lundin would be required to remediate the Humboldt Pit Lake by "putting a cover over the tailings" – e.g., installing a physical barrier between the water cover and the reactive tailings. This solution is certainly not among the options described in Humboldt's post-closure remediation plan, and appeared to come as a surprise to the DEQ when it was mentioned at the recent Humboldt Mill Public Meeting. At least one concerned citizen who spoke at the November 27th Public Meeting envisioned a "public recreation" facility that would be open to motorized boats and jet skis, while others expressed doubts as to how the lake would be seeded with fertilizer to help algae bloom, creating a protective mat of organic material covering tailings sediments, or wondered whether the lake water should be neutralized with lime or biochar.

We believe that Lundin's permit amendment request takes advantage of these significant environmental uncertainties, dangling the prospect of *"Initial studies are being conceptualized to consider the feasibility and potential end uses of an improved closure habitat for the HTDF, such as the establishment of a littoral zone around the perimeter of the water body to facilitate diverse plant growth and the establishment of more productive biological communities with higher trophic levels. This is a potential improvement compared to the former HTDF constitution where aquatic and fish species could not thrive or reproduce."*

In fact, environmental studies submitted with the original EIA showed there were fish in the Humboldt Pit Lake prior to the Mill's permitting ("former HTDF constitution") though the fate of the Humboldt Pit Lake fish community is now unclear. Lundin's industrial use of the lake, and the steady degradation of its water, demonstrate that the company has no regard for Humboldt's aquatic life, and the larger network of wildlife receptors such as muskrat, frogs, herons and eagles, who utilize the Humboldt Pit Lake as part of their ecological food chain.

The applicant's claim that it will be potentially create a littoral zone in the Lake suggests that Lundin has no scientifically rigorous reclamation plan, or even the rough draft of one. Rather, everything is a work in progress that will be finalized sometime in the future. Note the extreme amount of latitude the company uses in the previous statement: *initial, conceptual, consider, feasibility, such as, potential.* There is no serious reclamation plan here, only vague suggestions.

Lundin further states, in their amendment application letter: "The amendment for additional tailings placement does not require a modification to the existing contingency plan as the options for adjusting the WTP process or amending the HTDF as needed to facilitate stabilization remain applicable." It is unclear what the applicant means by "facilitate stabilization" – water quality? Structural deposition of underwater tailings?

We ask that the company be required to formally reevaluate closure costs and financial assurances, and revise the timeline in their Mine Reclamation Plan to accommodate the "impact of an Eagle East extension on mine closure requirements". In addition, we ask the DEQ to increase the Humboldt Mill's financial assurances, as the riskiness of the operation is increasing significantly (from a generous hundred foot water cap, to a minimum of perhaps 10 feet post-closure). Raising the elevation of the toxic tailings exponentially increases the likelihood that Humboldt's reactive tailings will come in contact with oxygenated waters, presenting a long-term or perpetual AMD treatment hazard.

“As part of the EIA process, Mine Reclamation Plans were separately developed for Eagle Mine and Humboldt Mill sites. The total closure cost estimate for the mine and the mill is approximately $48 million, including post-closure monitoring.”

According to the Company's Amendment Request letter, "Closure and Reclamation" statement:

> "During the initial closure/post-closure period, the water column that remains in the HTDF will *begin to resemble the water quality inputs of the watershed* including precipitation, groundwater, and surface water runoff. Similar lake characteristics are likely to exist which occur in nearby lakes of similar surface area (e.g. Lake Lory, Fish Lake, Perch Lake, Boston Lake), such as seasonal stratification and turnover, microbial productivity, organic matter deposition, and potentially the development of littoral zone plants and aquatic habitat."

This statement is so speculative as to be meaningless. The company is proposing that the Humboldt Pit Lake will be similar to *other lakes contaminated by legacy tailings?* What “microbial productivity” data has been collected for these lakes? What is the “likelihood” for Humboldt Pit Lake to achieve “development of littoral zone plants and aquatic habitat”? How many years, post-closure, will this miraculous ecological recovery require?

To be clear: the bar for post-closure "watershed integration" of the Humboldt Pit Lake is being set far too low!

Lake Lory is a **former tailings pond,** previously abandoned without reclamation by the Humboldt Mine, located in an area which is under consideration as a Superfund site under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). According to a report published in the early 1960s, "Water in the Black River is very soft (but) during low flow, hardness of water flowing out of Lake Lory and McKinnon Lake is about 85 and 130 ppm, respectively. These lakes are used as tailings basins for Humboldt mine. Downstream from Lake Lory Outlet, dissolved solids, iron and manganese, turbidity, and sometimes bicarbonate, sulfate, chloride, nitrate, and total hardness increase noticeably" and "dissolved solids range from about 50 to slightly more than 200 ppm (parts per million). Suspended sediment in the form of mineral tailings in effluents from ore-processing plants is a potential problem." Similarly, Perch Lake and Fish Lake are listed by name in the “Eat Safe Fish” materials produced by the State of Michigan, and fisherman are warned to strictly limit their consumption of pike (6 per year) from these waters due to mercury impairment.[19] Finally, none of these corollary lakes have been polluted by the specific Cu-Ni contaminants present in Eagle’s orebody, known to be aquatic toxins, along with barium, cobalt, iron, lead, manganese, and mercury, which may already exceed the freshwater chronic values for aquatic life.

Baseline Data Concerns Related To Amendment Request

In accordance with Part 632, two years of “baseline data” must be collected, and interrelated permits (such as NPDES and changes to HTDF) should be reviewed together. Have two years of baseline data been collected for the Escanaba River at the new location proposed for a new discharge point (“Outfall 004”)?

Incoherent or inaccurate baseline data may bias our conclusions about “pre-mining water quality” – in fact, there is no “pre-mining water quality data” for the Humboldt Mill site. Exploration and mining activity at the Humboldt Mill site has spanned the previous century: iron mining utilizing both underground and open pit methods, followed by the milling of gold with toxic tailings flushed into the Humboldt Pit Lake, followed by milling and tailings waste from Eagle Mine. This problem is especially important to consider when considering a mine site with a long history of intensive exploration, mining, milling or drilling. In 2017, after reviewing baseline data gathered by Rio Tinto at the Flambeau Mine site, Dr. Thomas Moran wrote a report dated 4-11-2017, highly critical of “baseline data” assertions made during the permitting of Flambeau. In the report, he notes that “hundreds or more exploration boreholes, together with road and site construction, trenches, dozens of monitoring wells and piezometers, and possibly tunnels have been constructed at the site prior to actual mining of ore. Such activities increase sediment loads and create pathways interconnecting the various horizontal and vertical portions of the local rocks, introducing atmospheric oxygen and other gases, microbes, and surface water, all of which alter the original baseline water quality and geochemical conditions.”

[19] http://www.michigan.gov/documents/mdhhs/EAT_SAFE_FISH_IN_MARQUETTE_CO_517920_7.pdf

The same thing could have been written about the Humboldt Mill site, and the Escanaba River: "baseline" water data presented during the permitting of Humboldt Mill represents water quality already altered and degraded by historic mining activities.

Requested: Contingency Plan Should Be Updated

According to a statement in the Amendment Request with the heading erroneously titled "Contingency Plan Update", there *is* no update for the contingency plan. It further states *"In addition, the mill and HTDF are equipped with the designs needed to prevent any potential uncontrolled releases of ARD during operations and closure, including a WTP that is designed for a broad range of water quality that could be experienced during operations."* In fact, the Water Treatment Plant was "undersized" according to Lundin's NI 43-101 report.

Request for Clarification of HTDF Limits: Are Tailings Regulated by Volume, Elevation, Both?

According to Lundin's 2016 Technical Report (NI 43-101), "Current tailings are utilizing more volume than originally planned due to steeper beach angles and lighter final settled density. Undertake immediate efforts to more evenly distribute tailings sub-aqueously in the HTDF and to monitor and to increase the final settled density. *Alternative tailings disposal methods should also be evaluated."*

Applicant fails to describe whether this (alternatives analysis) was done.

Lundin assessed the HTDF in 2016 and notes that there is capacity in the HTDF for **an additional one million to two million tonnes of tailings.** *"Additional tailings volumes beyond two million tonnes may require more innovative disposal techniques to maximize volume in the current facility."* The amendment application for Humboldt doesn't specify how many tons of tailings the company expects to deposit in the pit per unit of time (only a production rate), making it impossible to estimate an endpoint for deposition to the pit.

The permanent interment of mine waste in a community (Humboldt) which does not substantially gain from the economic or social benefits claimed by Lundin Mining is a textbook example of environmental injustice. The negative impacts of Eagle Mine and Eagle East project are disproportionately concentrated in a poor community, while water degradations span both the Lake Superior (Salmon Trout River and Yellow Dog River) and Lake Michigan (Middle Branch of the Escanaba River) watersheds.

Eagle East will push HTDF to max capacity or beyond. What are the "innovative solutions" under consideration by the applicant? This appears to suggest that alternatives were reviewed, but undisclosed. If the Company's calculations are incorrect, or if – as Lundin hopes – the Eagle East orebody connects with additional ore resources (for example, via a feeder system, or beyond the confines of the current mineral property), more ore will mean more tailings. Since the capacity of the HTDF is already in question, where does the Company propose to store any additional tailings? (what they call "innovative solutions"). **This is a reasonable and foreseeable future circumstance, as outlined in Part 632, and should be fully addressed.**

Lundin's 2016 NI 43-101 Technical Report on Eagle Mine and Humboldt Mill noted: "*Changes in water chemistry that may impact the current WTP capabilities as tailings are added to the HTDF. These changes are currently being evaluated to determine potential solutions that can be implemented during the current mine plan or in the future as needed."*[20]

According to a statement on p. 25 of Lundin's August 11, 2016 Technical Report (NI 43-101): "Based on initial assessment, sufficient capacity *appears to exist* within the Humboldt Tailings Disposal Facility (HTDF) for containment of Eagle East tailings."

Request for Clarification of Tailings BMP: "Ban Or Avoid Water Covers At Closure"?

Lundin's permit amendment request states: "Subaqueous disposal of tailings is commonly used for long-term storage of sulfide bearing tailings as a *best management approach."* It appears that this statement is no longer

[20] http://www.lundinmining.com/i/pdf/Eagle-Mine-TechnicalReport2016.pdf

true, given world-wide concerns about the safety of tailings storage facilities. In fact, tailings management technologies and best practices were the focus of a recent international mining conference, "Tailings and Mine Waste 2017" (Banff, Alberta, November 5-8, 2017: "This conference will provide mine waste managers, engineers, regulators and researchers an opportunity to discuss the latest developments in tailings and mine waste management..."). There is an emerging consensus, broadly supported, to "BAN (or avoid) large water covers at closure (dry closure, dry covers), or allow for only small ponds distant enough from any dam crest (at least a distance corresponding to a ratio 5 to 1, one being the height of the dam, and the distance from the crest 5 times the height, again, at closure–if dry closure or cover impossible for entire site)."[21] The applicant fails to consider how the Humboldt Pit Lake could be closed without a water cover, and no other tailings management solutions have been reviewed.

Applicant Fails to Demonstrate that Proposed Changes to Humboldt Mill will NOT Create Perpetual Care Facility

The DEQ's post-closure reclamation requirements are clear: "Upon completion of mining, the mine site and associated lands must be reclaimed to achieve a self-sustaining ecosystem that does not require perpetual care. There are extensive opportunities for public input throughout the permitting process."[22]

The applicant bears – and fails – the burden of proof, under Part 632.

DEQ PROCESS

Permit Application, As Public Noticed, Is Administratively Incomplete

Upon request, the DEQ provided their original Humboldt Mill Public Comment "Responsiveness Summary" but this document was found to contain broken links – links to numerous documents that are no longer available on the DEQ's website, nor found on the Eagle Mine website. In order for concerned citizens to review all material pertinent to the active Humboldt Mill permit, it is important that these historic files – supporting the ACTIVE Humboldt Mill Permit and the Environmental Impact Assessment, as well as the current amendment process – be included on the DEQ's public website (or in the GeoWebFace FTP server archives). We ask that the DEQ act proactively in this regard, collecting all necessary permit-related materials during their "administrative completeness" review. The Public Comment period is simply too short to expect stakeholders to "discover" the need for additional info, request additional materials, receive them, and review them.

In order for the application to be complete, all necessary materials must be provided. The applicant provided NO revised environmental impact assessment (EIA) evaluating the substantial changes they are requesting, which is clearly required by Part 632, R 425, Rule 206(1)(a).

DEQ Failure to Review Connected Applications in Coordinated Fashion

Significant changes to the Humboldt Mill Part 632 Permit Amendment Request should be reviewed in a coordinated fashion along with proposed changes to the Humboldt NPDES, and changes to the Wastewater Treatment Facility, since proposed changes made to the tailings deposition will result in changes to the Part 301 Permit (14-52-0032-P) as well as the NPDES Permit.

These uncertainties – cause and effect – are due to the interconnected nature of Lundin's active permits: tailings production > filling of Humboldt Pit Lake > water treatment plant > discharge to Escanaba River Watershed. The DEQ is aware of this interconnection. The September 13, 2017, "Administrative completeness determination Letter from DEQ" stated that Lundin's application for the Humboldt Mill permit amendment would **not** be administratively complete until the applicant submitted the application fee, and a list of all other interconnected permits.

[21] Correspondence from Ugo LaPointe, MiningWatch Canada.
[22] http://www.michigan.gov/deq/0,4561,7-135-3311_18442-309491--,00.html

Upon initial review, the OGMD has determined that the following items are necessary to make the amendment request administratively complete:

1. Permit application fee of $5,000.
2. List of other permits for Humboldt Mill that are currently or anticipated to be amended, modified, or renewed during the review, or as a result of approval of this amendment request, as applicable.

The public has not seen a final letter of "administrative completeness" nor the requested list of permits "currently or anticipated to be amended, modified or renewed during the review, or as a result of the approval of this amendment request." For example, Lundin acknowledged in their most recent Technical Report (NI 43-101), that their Part 301 permit, amended in April 2017, will need an additional amendment:

> **Inland Lakes and Streams Act Permit/Mill Site.** Required change.
> Additional permit for tailings disposal need to be modified for the additional placement of tailings. The studies and work required have been initiated.

We find that the DEQ has failed to require Humboldt's interconnected permits to be reviewed as a whole, allowing permits to be issued in a piecemeal fashion. An egregious example: the DEQ recently issuing minor permits, allowing Lundin to construct new discharge pipes – to be used for conducting direct discharge to the Middle Branch of the Escanaba River – critical new infrastructure needed for Lundin's *anticipated* significant revision of the Humboldt Mill NPDES permit. The public has not yet reviewed the NPDES permit, but the DEQ allows the company to build a new discharge pipe to the river? Such regulatory actions clearly undermine meaningful public participation in the permitting process.

The DEQ's regulatory approach to the Humboldt Mill meets the definition of steamrolling or segmentation, and contradicts Michigan law. Under NREPA, R324.1309 "*Submissions of applications for more than 1 type of permit. Sec. 1309. If a person submits applications for more than 1 type of permit for a particular development project, the department or departments shall process the applications in a coordinated fashion to the extent feasible given procedural requirements applicable to individual permits and, at the request of an applicant, appoint a primary contact person to assist in communications with the department or departments."* This approach is also allowed for, explicitly, under Part 324.63205 (15) *"...with respect to a particular mining operation, the department may process the applications in a coordinated fashion to the extent feasible given procedural requirements applicable to individual permits. The coordinated permit process may include consolidating public hearings under this part with public hearings required under other parts of this act."*[23]

DEQ Failed to Convene "Multi-Disciplinary Team" to Review Amendment

"The Michigan Department of Environmental Quality oversees the statutes and regulations that apply to mining activities, and convenes multi-disciplinary teams to address the unique requirements of each proposed mining project. Most of Michigan's environmental regulations are contained in the Natural Resources and Environmental Protection Act. Regulations address issues such as transportation, storage, treatment, and disposal of ore, waste rock, and other materials and plans for mining and reclamation that will minimize impacts of the proposed operation."[24]

CONCLUSION

We are concerned that Michigan law (especially Part 301, with regards to the filling of Humboldt Pit Lake with toxic mine tailings) and the Clean Water Act are being applied inconsistently, and that regulations are improperly interpreted. The Humboldt Pit Lake is treated, simultaneously, as an "Inland Lake" according to Michigan's Part 301 Inland Lakes and Streams Program, but not regarded as "waters of the state" under Part 31. The DEQ's stewardship of Michigan's freshwater natural resources is the shared interest and responsibility of all

[23] http://www.legislature.mi.gov/documents/mcl/pdf/mcl-act-451-of-1994.pdf
[24] http://www.michigan.gov/deq/0,4561,7-135-3311_18442-309491--,00.html

stakeholders. Concerned citizens, the Keweenaw Bay Indian Community, the Community Environmental Monitoring Program, the Mining Action Group and other UPESG stakeholders have all expressed our concerns regarding Lundin's use of the Humboldt Pit Lake as a "waste disposal facility" which appears to violate common sense, as well as the law. We ask the DEQ to regulate this in full accordance with the Clean Water Act and NREPA, keeping in mind that Michigan citizens and the Escanaba River Watershed will bear the burden of these polluting activities long after Lundin's mining and milling operations have ceased.

We believe the Humboldt Mill amendment request does not fulfill the requirements of Part 632. The applicant failed to provide an updated EIA, failed to update the reclamation plan, dismissed the contingency plan, failed to provide a list of all additional necessary permits, and did not increase the financial assurity to offset the significant, permanent environmental hazards posed by additional tailings storage and reduced water cover at the Humboldt Pit Lake.

The Applicant has Not Met the Standard for Review

Furthermore, the DEQ has a statutory requirement under Section 324.63207 (6)(c) of Part 632 to **"submit the request for amendment to the same review process as provided for a new permit application"** and consolidate multiple permits into a single review process, to facilitate public participation.

The DEQ has Not Met this Statutory Requirement

The permit amendment request is fundamentally incomplete, as it falsely and narrowly limits discussion to a single permit condition; because Condition F.4 is being considered apart from other connected permits and deprecated permit conditions, steamrolling the permit process without offering an opportunity for public input; and because the applicant provides no supporting material, with no updated analysis of the cumulative Environmental Impacts.

> *"DEQ shall deny a permit if it determines that the mining operation will "pollute, impair, or destroy, air, water or other natural resources or the public trust in those resources, in accordance with part 17 (Michigan Environmental Protection Act.)"*

This permit amendment request is obviously unsubstantiated and incomplete. Environmental stakeholders are unable to consider the implications of such a significant change, in the absence of monitoring data, modeling, and the lack of a revised EIA. Confident predictions made by Lundin's experts in public presentations do not change our conclusion. **Please deny the Humboldt Mill MP-012010 permit amendment request, on the grounds that it fails to meet the standard for review as required under Part 632.**

Thank for your full consideration of our comments and questions.

SIGNED,

Kathleen Heideman, Mining Action Group of the Upper Peninsula Environmental Coalition
Steve Garske, Mining Action Group of the Upper Peninsula Environmental Coalition
Jon Saari, Mining Action Group of the Upper Peninsula Environmental Coalition
Nathan Frischkorn, Mining Action Group of the Upper Peninsula Environmental Coalition
Horst Schmidt, President of the Upper Peninsula Environmental Coalition