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SENT ELECTRONICALLY

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RE: Supplement to WaterLegacy Petition for Withdrawal of Program Delegation from the State of Minnesota for NPDES Permits Related to Mining Projects
Dunka Mine Information – NPDES/SDS Permit

Dear Ms. Hyde, Ms. Wester:

In our telephone conference on August 27, 2015, WaterLegacy briefly discussed ongoing research we and our consultants have been conducting regarding deficiencies in the Dunka Mine NPDES/SDS permit. Our research has identified impacts on receiving waters from Dunka discharge that violates Minnesota numeric and narrative water quality standards, yet does not violate conditions in an out-of-date and scientifically indefensible permit and variance.

U.S. Environmental Protection Agency (EPA) staff and counsel recommended that information gathered by WaterLegacy and others on the asserted deficiencies with the Dunka Mine permit and variance be submitted to EPA as a supplement to WaterLegacy Petition for Withdrawal of Program Delegation from the State of Minnesota for NPDES Permits Related to Mining Projects (Petition). Attached with this letter, please find Folder A, containing Discharge Monitoring Reports, Discharge Supplements, Summaries and Reports pertaining to the Dunka Mine; Folder B, containing articles published by the Timberjay in October 2015 regarding the Dunka Mine, along with two sets of questions to MPCA and responses; and Folder C, containing the 2001 NPDES permit and various Consent Decree documents related to the Dunka Mine.

The attached materials support the Petition's claim that the MPCA has failed to issue a timely NPDES permit for the Dunka Mine, that the Dunka variance does not comply with the Clean Water Act and that the MPCA's failure to issue current and rigorous permits in compliance with

the Clean Water Act, including an NPDES permit for the Dunka Mine, has resulted in and continues to result in violations of Minnesota's numeric and narrative water quality standards, jeopardizing aquatic life, wildlife, and human health.

This cover letter highlights some of the evidence contained in the attached materials, but does not claim to identify all deficiencies reflected in the attached Dunka Mine record. It should be noted that many of WaterLegacy's concerns about the inadequacy of the Dunka Mine permit and the continued violation of Minnesota water quality standards are not disputed by the MPCA.

1) The Dunka Mine permit and variance were issued in 2001 and expired in 2005, with an application for reissuance filed in 2004. Yet the MPCA has no current timetable for reissuance of the permit, and is only "starting" to review pertinent information:

> (Set 1) Timberjay Question 1: Do you have, or are you working on, a more recent permit for Dunka than the 2001 NPDES permit? If so, could I get a copy of it?
> MPCA Response: We have started reviewing the application for reissuance and supplemental information. We do not have a target date for public notice.

2) The 2001 Dunka Mine variance used a final acute value (FAV) for additive metals toxicity, despite the fact that receiving waters have a 7-day-10 year low flow (7Q10) of zero, which requires compliance with chronic standards (CS).

> (Set 1) Timberjay Question 8: Why does the MPCA utilize FAV rather than CS standards? The former agency official I spoke to insists the agency, under its own rules, should be using CS, not FAV.
> MPCA Response: In order to realize achievable environmental improvements in the timeliest manner, MPCA staff opted to use additive FAV as an alternative approach in addressing the elevated metal concentrations back in 2000. . . It is anticipated that a draft permit for reissuance will not utilize FAV but instead will utilize effluent limitations for each individual metal, based on the CS, at each outfall.

3) For most contaminant parameters, the 2001 Dunka Mine permit requires nothing but monitoring. Cliffs Erie can be "compliant" with its permit without controlling contaminants.

> (Set 2) Timberjay Question 1: When I previously asked about compliance with state and federal water quality standards at Dunka, you replied that the company was in compliance with the standards applied in its permit. When I review the 2001 NPDES permit, however, I see that for most contaminant parameters, the permit requires the company to "Monitor Only." Am I correct, in other words, in assuming that the company is compliant simply by monitoring, regardless of the contaminant levels its monitoring might reveal?
> MPCA Response: Yes, they are compliant with the "Monitor Only" portion of their permit simply by monitoring.

4) Dunka Mine discharge monitoring reports and supplementary reports identify exceedances of Minnesota numeric water quality standards for copper and nickel at Unnamed Creek discharge

points, including wetlands treatment discharge from SD007. From June 2010 through December 2014, even using a hardness level of 400 mg/L to calculate toxicity, more than 60 percent of the nickel levels at SD007 exceeded Minnesota standards, with a maximum nickel level of 2,550 µg/L and five samples exceeded Minnesota standards for copper with a maximum level of 45.4 µg/L. The MPCA agrees these standards are being violated. (Folder A, DMRs and Summaries, MPCA_031915Updated_DunkaDMRs.xlsx).

(Set 2) Timberjay Question 6: Do you agree that if the agency calculated the allowable metals limits based on the hardness of water in Bob Bay or the background hardness of Unnamed Creek, that Dunka would be in regular violation for both nickel and copper discharges?
MPCA Response: The effluent limits that would be included in the reissued permit have not yet been calculated – this will be done as part of the process for permit reissuance. However, based on a preliminary review of the available monitoring data and considering established MPCA effluent limit calculation procedures, it appears likely that copper could at times exceed a probable effluent limit at one of the five wetland treatment system discharges and nickel could at times exceed a probable limit at three of the discharges.

5) Wetlands treatment discharge from the Dunka Mine is the source of high levels of specific conductance ionic contamination as well as exceedance of hardness levels.

From 2013 through spring of 2014, all sampling events at SD007, a point of from Dunka Mine treatment wetlands, exceeded Minnesota's irrigation standard of 1,000 µmhos/cm[1]; maximum concentration was 2,641µmhos/cm. Equally striking, from June 2010 through December 2014, all sampling events at SD007 exceeded Minnesota's hardness standard of 500 mg/L; maximum concentration was 1,810 mg/L. (Folder A, DMRs and Summaries, WaterLegacySummary_DunkaSW-001&SD-007.xlsx, MPCA_031915Updated_DunkaDMRs.xlsx).

6) Downstream at Bob Bay (SW001), Dunka Mine discharge resulted in multiple exceedances of water quality standards for nickel, copper, hardness and specific conductance. The SW001 site is 4,950 feet from discharge point SD008, and Dunka waste rock piles comprise about one-third of the watershed acreage, so sampling could be diluted by rainfall over about two-thirds of this sub-watershed. Natural levels of hardness in Unnamed Creek are below 50 mg/L, so applicable Minnesota water quality standards would be 6.4 µg/L for copper and 88 µg/L for nickel pursuant to Minn. R. 7050.0222.

Even after wetlands treatment and significant dilution, from 2013 through spring of 2014, nickel at SW001exceeded Minnesota water quality standards nine times, with a maximum level of 381 µg/L; copper exceeded Minnesota standards five times, with a maximum level of 16.4 µg/L; hardness exceeded Minnesota standards eleven times, with a maximum level of 2,270 mg/L, and specific conductance exceeded Minnesota standards nine times with a

[1] The unit of measurement for conductivity is expressed in either microSiemens (µS/cm) or micromhos (µmhos/cm). EPA guidance uses the former measure, while MPCA rules use the latter; they are interchangeable.

maximum level of 1,370 µmhos/cm.

7) MPCA's failure to reissue an up-to-date Dunka Mine permit also results in failure to protect downstream waters from excessive sulfate, threatening wild rice and increasing mercury methylation risks. Although Birch Lake contains wild rice downstream of Dunka Mine discharge and elevated sulfate is common at surface water sampling site SW001, MPCA has made no effort to require compliance with Minnesota's 10 mg/L wild rice sulfate standard or to limit sulfate to reduce methylmercury risks. Every sulfate sample taken at SW001 from January 2013 to May 2014 exceeded 100 mg/L, with a maximum concentration of 1,840 mg/L of sulfate. (Folder A, DMRs and Summaries, WaterLegacySummary_DunkaSW-001&SD-007.xlsx).

> (Set 2) Timberjay Question 7: How does the agency justify allowing discharges of sulfate as high as 1,840 mg/l into Bob Bay? Besides the impact to wild rice, it's my understanding that sulfates also facilitate the methylization of mercury. . .
> MPCA Response: The reissued permit will need to address the control of sulfate in the discharges to comply with, at minimum, the Class 4B wildlife criteria (currently expressed as 1000 mg/L) and potentially the Class 4A standard in any downstream waters that are determined to be wild rice waters. There is no water quality standard for sulfate in the context of methylation of mercury.

8) Neither the 2001 Dunka Mine permit nor the MPCA's responses to Timberjay questions sufficiently consider compliance of Dunka Mine discharge with Minnesota narrative standards precluding degradation of water quality or toxicity to aquatic life, including macroinvertebrates. Specifically, discharge of specific conductivity must be evaluated according the potential to affect aquatic life, not in terms of agricultural irrigation standards.[2]

9) WaterLegacy disputes claims made by Cliffs Erie and accepted by the MPCA that releases from the Dunka Mine are not toxic. In addition to using an acute, rather than a chronic standard to evaluate toxicity, MPCA sets its additive standard for metals release at the maximum 400 mg/L of hardness, a position that is inconsistent with the definition of "water quality characteristics" in Minnesota Rules.[3] When whole effluent toxicity (WET) testing was initially performed by Cliffs Erie in May 2014 with low hardness water representative of Birch Lake, the discharge failed the test. Dunka discharge only "passed" toxicity testing when the test was repeated with Moderately Hard Reconstituted Water (MHRW) from the laboratory. (Folder A, DMR for 5-31-2014, Toxicity Report for 2014_MayJune WETtox).

10) WaterLegacy believes that more rigorous analysis of the Cliffs Erie biological sampling done in 2011 and 2014, along with an appropriate comparison to benthic invertebrates in reference streams, confirms that Dunka Mine discharge has reduced and continues to reduce the richness

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[2] Bruce Johnson and Maureen Johnson have completed a report, *An Evaluation of a Field-Based Aquatic Life Benchmark for Specific Conductance in Northeast Minnesota* (2015), applying the methods of the EPA's *A Field-Based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams* (2011) to Minnesota historic and current data on water quality and macroinvertebrates. This report will be provided to EPA in November 2015.

[3] See Minn. R. 7050.0218, Subp. AAA, "'Water quality characteristic' means a characteristic of *natural* waters, such as total hardness or pH." emphasis added.

of macroinvertebrate communities. A brief excerpt from the forthcoming Johnson (2015) report is provided below. Several citations are simplified or omitted in this excerpt:

> Almost 40 years ago, Copper-Nickel Study biological sampling suggested that mine dewatering causing varying flows and substrate disruption might have contributed to the negatively impacted Unnamed Creek invertebrate populations. (Johnson, 1978). Since the LTV Dunka Mine closure, no pit dewatering discharges have entered the Creek. Cliffs has concluded that the substrate at the sampling location is suitable and the recent 12 years of invertebrate data has had no significant change. (Cliffs, Request for Variance, 2011). With neither flow issues nor poor substrates as potential contributors to observed invertebrate impacts, *contaminant chemicals in the water are the most likely cause of continuing negative invertebrate impacts*. Recent invertebrate data underscore that passive wetland treatment and management changes since 2010 have not re-established the invertebrate populations.
>
> Comparison of Cliffs' report of Unnamed Creek family and genera richness for Ephemeroptera, Plecoptera, Trichoptera with data from four unimpacted similar streams in the same ecosystem indicates there are far fewer families, fewer genera, and less total richness of EPT than background streams. This data is reflected in the following Table 6. (Cliffs, 2011; Doran, 2014).

Table 6 - Benthic Invertebrate Richness Comparison
Dunka (Impacted) Unnamed Creek & Background Creeks (Cu-Ni Study)

	Unnamed (6 yrs)	Background Creek Mean	Unimpacted Streams (3 yrs)			
			Keeley	Filson	August	Nira
Ephemeroptera families	3	6.25	7	7	6	5
Plecoptera families	1	3.75	3	3	5	4
Trichoptera families	10	9	7	9	10	10
Ephemeroptera genera	4	11	12	12	9	11
Plecoptera genera	2	5	4	3	8	5
Trichoptera genera	13	15.8	17	17	18	21
Total EPT Genera Richness	19	33.3	29	32	35	37
Total EPT Family Richness	14	19.5	17	19	21	19

> In Table 6, a summary of six years of family and genera EPT for Unnamed Creek is compared with a summary of three years of data from four unimpacted background streams in the same area. Background streams are close to Unnamed Creek and of similar stream order. This table clearly demonstrates Unnamed Creek is substantially less rich in both Ephemeroptera and Plecoptera families and genera . . .
>
> In general as discussed previously, Trichoptera tend to be insensitive to pollutants, so the differences in Trichoptera are minor. Far more significant disparities in Ephemeroptera and Plecoptera families and genera are evident; there are more than twice as many Ephemeroptera families and more than three times as many Plecoptera families in unimpacted waters. There are also 275 percent more Ephemeroptera genera and 250 percent more Plecoptera genera in unimpacted waters than in the Unnamed Creek waters impacted

by Dunka Mine discharge. These values are consistent with EPT richness losses reported by Pond (Pond, 2008) in the mined areas of the Appalachians.

This disparity in taxa richness cannot be attributed to non-anthropogenic geology. Filson Creek is located on an exposed Duluth Complex rock similar to the location of Dunka Mine. Yet, as shown in Table 6, Filson Creek has demonstrated no invertebrate impairment. With Filson as a paired background creek, the exposed Duluth Complex at Dunka is unlikely to be a significant contributor to the invertebrate impairment.

Cliffs' report on Unnamed Creek used the Hilsenhoff Biotic Index (HBI) to estimate the overall health of the invertebrate population in Unnamed Creek. The HBI estimates the *general* overall tolerance of the community according to relative abundance of the family taxonomic groups in the Creek community that were given a numeric sensitivity value. In using the HBI, the Cliffs report missed some important aspects of data interpretation.

The HBI protocol counts all Ephemeroptera families as highly sensitive. In fact, for specific conductance, this is not the case. The EPA has determined that many Ephemeroptera genera common to Minnesota are tolerant to high specific conductance. For example, Ephemeroptera Caenis sp. has a XC95% tolerance that exceeds >3,923 µS/cm, compared to Ephemeroptera Leptophlebia sp. with a tolerance of 251 µS/cm. Compared to the methods of the EPA Conductivity Benchmark Study, the HBI as used by Cliffs is a gross method of evaluation and lacks necessary sensitivity for this report.

WaterLegacy continues to be concerned that the MPCA is failing to regulate mining pollution in Minnesota and that the Agency's expired variances and out-of-date and inadequate permits may interfere with control of pollution to meet Minnesota water quality standards, rather than facilitating compliance with the state standards and the federal Clean Water Act.

Please feel free to contact me at 651-646-8890 if you have any questions regarding this supplemental submittal.

Respectfully submitted,

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Enclosures:

Folder A: Dunka Mine Discharge Monitoring Reports, Discharge Supplements, DMR Summaries and Toxicity Reports;

Folder B: Dunka Mine articles published by the Timberjay in October 2015 regarding the Dunka Mine, Timberjay Questions to MPCA with MPCA Responses;

Folder C: Dunka Mine 2001 NPDES/SDS Permit, 2001 MPCA Approval, Consent Decree Documents.