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November 19, 2018

Nancy Schuldt, Water Projects Coordinator
Fond du Lac Reservation
1720 Big Lake Road
Cloquet, MN 55720

RE: Fond du Lac Band 2018 Revised Water Quality Standards

Dear Ms. Schuldt,

WaterLegacy is a Minnesota non-profit organization founded to protect Minnesota water resources and the communities of plants, animals and humans that rely on these resources. On October 25, 2018, we provided technical drafting comments on revisions to the Water Quality Standards (“WQS”) for the Fond du Lac Band of Lake Superior Chippewa. We’ve also signed the Minnesota Environmental Partnership conservation group letter supporting the Band’s revised Water Quality Standards protecting wild rice, aquatic life, wetlands and water quality from pollutants and habitat alterations.

With this letter and eight Attachments sent to the Band in electronic format on a flash drive by U.S. Mail, WaterLegacy submits additional comments specifically supporting the Band’s proposed numeric standard of 300 microSiemens/centimeter ($\mu\text{S}/\text{cm}$) to prevent toxicity to aquatic life from specific conductance¹ in Reservation waters.²

Since 2011, WaterLegacy and the citizen scientists with whom we collaborate have been concerned that elevated levels of specific conductivity in northeast Minnesota waters have caused or contributed to impairments identified in fishes bioassessments and aquatic macroinvertebrate bioassessments. In Triennial Review for the State of Minnesota we have asked that the Minnesota Pollution Control Agency (“MPCA”) adopt numeric standards for specific conductance in those ecosystems where there is sufficient data to apply U.S. Environmental Protection Agency (“EPA”) field study guidance to prevent extirpation of sensitive benthic macroinvertebrates (aquatic insects) upon which healthy ecosystems rely.

We support the Fond du Lac Band’s leadership in establishing a water quality standard for specific conductance, and hope that the Band’s example will inspire the MPCA to undertake rulemaking to limit specific conductance, as well as to calculate site-specific effluent limits for specific conductance in permits to comply with Minnesota’s narrative standards prohibiting toxic discharge.³

¹ In these comments, the phrases “specific conductance” and “specific conductivity” have the same meaning.

² Fond du Lac Band of Lake Superior Chippewa Water Quality Standards of the Fond du Lac Reservation, Ord. # 12/98, as amended, Revised Water Quality Standards. Sept. 28, 2018 (hereinafter “FDL WQS 2018 Rev.”), Section 301(k), available at <http://www.fdlrez.com/RM/downloads/WQSDraftCopy.pdf>

³ Pertinent Minnesota standards are at Minn. R. 7050.0217, subp. 1, 2(A).

A field-based method of determining aquatic life numeric criteria for specific conductivity was finalized by the EPA in 2011.⁴ A wealth of scientific evidence developed by the EPA Office of Research and Development and published in peer-reviewed literature since then establishes that dissolved salts, whether measured in milligrams per liter of specific ions or measured in microSiemens of conductivity, extirpate sensitive aquatic insects and adversely impact freshwater fish.⁵

In 2015, retired Minnesota regulators Bruce Johnson and Maureen Johnson undertook a review of background levels of specific conductivity in parts of northeast Minnesota Ecoregion 50, along with data pertaining to benthic invertebrates (aquatic insects) in both impacted and unimpacted waters in the ecoregion.⁶ They concluded that the EPA protocols for field-based specific conductivity criteria were applicable to northeast Minnesota surface waters. In addition, they recommended adoption of a numeric criterion of 300 $\mu\text{S}/\text{cm}$ as a chronic value of year-round application in order to protect benthic macroinvertebrates according to the criteria (prevent 5% extirpation of invertebrate genera/protect 95% of genera) set by the EPA.⁷

The EPA's Office of Research and Development reviewed the Johnson & Johnson Specific Conductance Evaluation and concluded in a memorandum dated February 4, 2016, that the weight of evidence supported the inference that effluents that increase specific conductance to more than 300 $\mu\text{S}/\text{cm}$ are likely to extirpate more than 5% of genera common to both Minnesota and Appalachia - the ecoregion EPA initially studied - and to have adverse effects in northeast Minnesota waters.⁸

The EPA reviewed a broader set of Minnesota data on benthic invertebrates and water quality to independently validate the conclusions reached in the Johnson & Johnson Evaluation. The EPA concluded that "the inference that 5% extirpation of benthic invertebrates would occur at similar conductivity levels in central Appalachia and Ecoregion 50 in Minnesota was supported by analysis of an independent data set of paired benthic invertebrate and SC data from Ecoregion 50 in Minnesota."⁹

In December 2016, after extensive peer-review, the EPA released for public review its draft field-based methods for States (and Tribes with Treatment as a State authority) to use in developing aquatic life criteria for specific conductivity in regions outside central Appalachia.¹⁰

⁴ EPA, A Field-Based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams, Final Report, EPA/600/R-10/023F, March 2011 ("EPA 2011 Conductivity Benchmark Report"), *Attachment 1*.

⁵ See M.B. Griffith, L. Zheing, S.M. Cormier, Using Extirpation to Evaluate the Ionic Tolerance of Freshwater Fish, *Env. Tox. & Chem.*, Vol. 9999, Number 9999, pp. 1013, 2017 (accepted for pub. Oct. 2017), *Attachment 2*, and G. Suter, U.S. EPA ORD, Micro Siemens or Milligrams: Measured of Ionic Mixtures, PowerPoint presentation Jan. 11, 2017, *Attachment 3*.

⁶ B.L. Johnson & M.K. Johnson, An Evaluation of a Field-Based Aquatic Life Benchmark for Specific Conductance in Northeastern Minnesota, November 2015. *Attachment 4*, including Table 1.

⁷ *Id.*, p. 42.

⁸ S. M. Cormier, Ph.D., Review Memorandum for "An Evaluation of a Field-Based Aquatic Benchmark for Specific Conductance in Northeast Minnesota" (November 2015) Prepared by B. L. Johnson and M. K. Johnson for WaterLegacy, Feb. 4, 2016, ("EPA Review Memo"), p. 2. *Attachment 5*.

⁹ *Id.*, p. 10.

¹⁰ EPA, Field-Based Methods for Developing Aquatic Life Criteria for Specific Conductivity, Public Review Draft, EPA-822-R-07-010 December 2016 ("EPA 2016 Field-Based Methods"), *Attachment 6*.

Appendix D to the EPA's 2016 Field-Based Methods report detailed the method that should be used by states to develop a numeric criterion for specific conductance where there is sufficient water chemistry and biological data to calculate extirpation concentrations and hazardous concentrations.

The EPA reviewed biological and specific conductivity data for 62 Level III Ecoregions, including Ecoregion 50 (Northern Lakes and Forests), where the Fond du Lac Reservation is located. The EPA map below shows these Minnesota ecoregions, along with paired biological and water quality sampling sites.¹¹

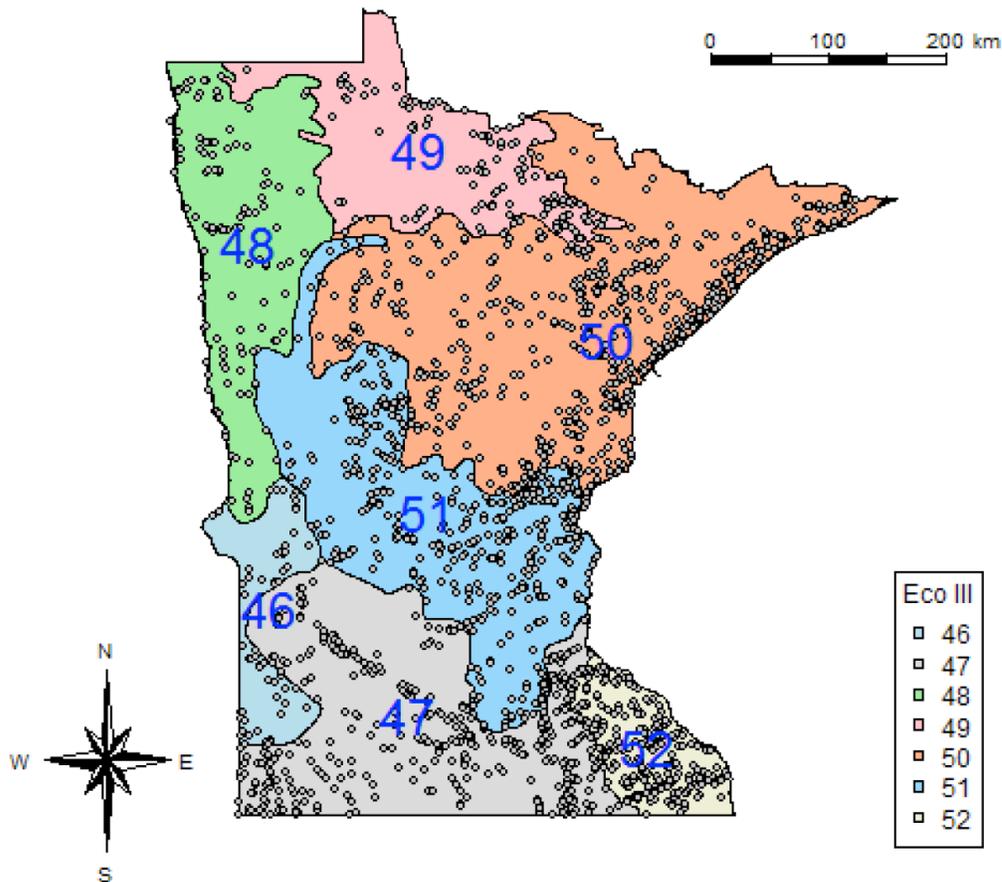


Figure 2. Ecoregion 50 is contained in the orange area in the northeast portion of Minnesota. Circles represent paired biological and water quality sampling sites. There are fewer samples in the area bordering Canada, often referred to as the boundary waters, which are less accessible for sampling.

For Ecoregion 50, the Northern Lakes and Forests region where the Fond du Lac Reservation is located, the EPA had sufficient and consistent data to recommend a specific conductance standard. Based on 734 samples and 596 sites in Ecoregion 50, the EPA recommended a provisional standard of 320 $\mu\text{S}/\text{cm}$ applicable across Ecoregion 50 based on hazardous

¹¹ EPA Review Memo, *Attachment 5*, p. 7.

extirpation concentration data regarding specific conductivity.¹²

Since December 2016, the EPA has published in peer-reviewed journals the scientific basis for establishing the proposed specific conductivity hazardous concentrations based on the weight-of-evidence process, the use of extirpation to evaluate tolerance of specific conductivity, and the step-by-step calculation to predict specific conductivity levels that extirpate freshwater aquatic benthic invertebrates. The EPA has also developed spreadsheet tools to conduct this analysis and predict stressor levels that extirpate genera and species.¹³

There is a sound, evidence-based rationale for the Fond du Lac Band's adoption of a specific conductance water quality standard of 300 $\mu\text{S}/\text{cm}$. In 2011, the EPA developed guidance for a field-based benchmark of 300 $\mu\text{S}/\text{cm}$ standard in central Appalachia and suggested how data could be used to confirm the appropriate limits for specific conductivity to protect aquatic life in other ecoregions.

In response to this guidance, independent researchers reviewed Minnesota data since the 1970s indicating that, in Minnesota Ecoregion 50, benthic macroinvertebrates in waters unaffected by mining pollution have sensitivities comparable, if not greater than in the Appalachian regions studied. In the portions of Ecoregion 50 they analyzed, Johnson and Johnson recommended applying 300 $\mu\text{S}/\text{cm}$ as the aquatic life benchmark to protect aquatic life from extirpation as a result of elevated levels of specific conductance.

The EPA, not only confirmed the reasonableness of Johnson and Johnson's conclusions, but independently confirmed with hundreds of water quality and biologic samples, that specific conductance hazardous concentrations resulting in extirpation of benthic invertebrates would occur throughout Minnesota Ecoregion 50 at or near the 300 $\mu\text{S}/\text{cm}$ level. Although EPA's draft 2016 Field-Based Methods instructions have not yet been finalized by the Agency, in the last few years EPA has published each step of its scientific methodology in peer-reviewed journals. The Fond du Lac Band was entitled to rely upon Minnesota data and analysis, EPA review of that analysis, EPA benchmark methodology, and publications in peer-reviewed journals, as well as decades of its own data, to protect aquatic life in Reservation waters from specific conductance ionic pollution.

Moreover, the Band was obligated, as a Tribe with Treatment as a State under the Clean Water Act, to conduct a triennial review and update water quality standards to ensure that the standards serve the purposes of the Act, and protect the public health and welfare, enhance the quality of water and take into consideration the propagation of fish and wildlife.¹⁴

WaterLegacy, on behalf of citizens throughout Minnesota, supports the Fond du Lac Band's

¹² EPA 2016 Field-Based Methods, Appendix D. Development of a Background-to-Criterion Regression Model, at D-4, D-23, *Attachment 7*.

¹³ S.M. Cormier, L. Zheing, E.W. Leppo, A. Hamilton, Step-by-step calculation and spreadsheet tools for predicting stressor levels that extirpate genera and species, *Int. Env. Assess. & Mgt.*, Vol. 9999: 9999, pp. 1–7 (accepted for publication Oct., 2017); G. Suter, S.M. Cormier, M. Barron, A Weight of Evidence Framework for Environmental Assessments: Inferring Qualities, *Int. Env. Assess. & Mgt.*, Vol. 13: 6, pp. 1038–1044; G. Suter, S.M. Cormier, M. Barron, A Weight of Evidence Framework for Environmental Assessments: Inferring Quantities, *Int. Env. Assess. & Mgt.* Vol. 13:6, pp. 1045–1051; Articles collected as *Attachment 8*.

¹⁴ 33 U.S.C. §1313(c)(1) and (c)(2)(A); 40 C.F.R. §131.4.

revised water quality standards limiting specific conductance ionic pollution as a reasonable and necessary application of ecoregion-specific evidence, federal guidance, and peer-reviewed science to protect water quality and aquatic life consistent with the Clean Water Act and the Band's sovereign authority.

Please feel free to contact me at 651-646-8890 if you have any questions regarding WaterLegacy's comments.

Sincerely yours,

A handwritten signature in cursive script that reads "Paula G. Maccabee".

Paula G. Maccabee

Advocacy Director & Counsel for WaterLegacy

Attachments