Fond du Lac Water Quality Standards Triennial Review
Final Report and Summary of Responses
December 2019

The Fond du Lac Environmental Program, Office of Water Protection (FDL OWP), has completed its water quality standards triennial review process. The Band is required to periodically review our standards, which were originally approved by the US EPA in 2001, and propose any updates or revisions that reflect new information or research, so that our standards can be as protective as possible of the reservation's abundant water resources. We evaluated the entire ordinance and considered any necessary updates to designated uses, narrative and numeric criteria, our antidegradation policy and implementation, and contemplated additional culturally specific language and perspectives that are relevant to the implementation of our standards. We considered all applicable water quality standards that we are required to review every three years, including new Clean Water Act section 304(a) criteria recommendations. In addition to incorporating one new national aquatic life use criterion (ammonia), proposing numeric nutrient criteria for priority fisheries lakes and biological criteria for streams, proposing wetlands water quality standards, and proposing an aquatic life use criterion for specific conductance, we also specifically examined our standards for protecting wild rice and determined the need and scientific basis for maintaining the existing sulfate criterion, and expanding habitat and natural hydrology protection through new narrative standards.

Public Process

We conducted our triennial review process according to federal and tribal requirements, including the early public notification and solicitation of input from the tribal community and interested stakeholders, in coordination with and outreach to local, tribal, state, and federal agencies.

We hosted a public meeting on Friday, January 12, 2018 to announce our general approach and scope for reviewing and updating our WQS, and to invite ideas from the community about water resource protection priorities. A public notice for the meeting was posted throughout the reservation, including Fond du Lac Resource Management Division, the tribal center, and the three district community centers, announced on the tribal radio station WGZS, on the FDL Resource Management Facebook page, and in the monthly tribal newspaper. This meeting was lightly attended, with fewer than 20 participants, but there was good conversation about how well the Band's water quality program was operating and opportunities for the community to ask questions. The Fond du Lac community is largely supportive of the work we are doing to protect the lakes, streams, wetlands and groundwater resources of the reservation.

After the revised standards were drafted, they were posted on September 28, 2018 on the Fond du Lac website, http://www.fdlrez.com/RM/waterrevisedwqs.htm , along with a collection of documents and reports that support and explain our proposed rule changes. In addition to posting on our website, public notice of the draft revised standards was advertised in the Duluth News Tribune (print and online) from September 28 through October 4, 2018. Both notices encouraged interested people to check back

on the website for information about the scheduling of the public hearing on the draft revised standards. Hard copies of the draft revised standards were available at FDL Resource Management, the FDL tribal center, the three tribal community centers, and at the Cloquet Public Library. An article describing the nature and intent of the revised standards was published in the tribal newspaper (November 2018). The email address, phone number and mailing address for the FDL Water Projects Coordinator was provided as the primary contact and recipient for comments and questions. The public notice indicated that comments would be accepted through November 19, 2018, but as our public hearing date was pushed back until several weeks later (December 6, 2018), we extended that comment period until the day after the public hearing. An email "blast" was sent out reservation-wide on the date of the public hearing, reminding everyone on the tribal distribution list of the opportunity to comment on the proposed water quality standards revisions.

We encouraged band members and the interested public to review these supporting documents along with the water quality standards, especially two reports: a Health Impact Assessment that examines how changes to wild rice water quality regulations could affect tribal health, and an economic benefits study that provides, for the first time, an accounting of the economic benefits of natural, hand-harvested manoomin to tribal and state economies. This study was commissioned in response to the complete lack of consideration of the economic benefits of healthy, sustainable wild rice beds as the state of Minnesota proposed its wild rice water quality rule changes last year. The Health Impact Assessment or "HIA" is also a rich source of information about how important healthy manoomin is for our tribal community to be healthy, and we appreciate the input and participation from members of the community and our study partners as we worked through the process. Hard copies of both reports were also made available at the tribal center and at FDL Resource Management, and distributed at local and regional environmental meetings. The report is available at:
http://www.fdlrez.com/RM/downloads/WQSHIA.pdf

We received a significant number of questions and even a request for an advance meeting with "upstream" (St. Louis River watershed) stakeholders who expressed concern about our proposed specific conductance standard and the implications for their regulatory requirements. FDL tribal leaders and OWP staff met in tribal council chambers on November 26, 2018 with representatives from the state legislature, Minnesota Power (Allete), and the Range Association of Municipalities and Schools, to discuss this particular proposed water quality criterion and their concerns.

The public hearing was held at 4:00 PM on December 6, 2018 to invite questions and gather input from the tribal community and other interested parties. Fact sheets on the revised standards were provided, and an open house with informational posters and tables were set up in the FDL Resource Management Division foyer for several hours prior to the beginning of the hearing. It was well attended by FDL community members and tribal leadership, non-tribal community members and local/regional residents, staff from neighboring tribes and agencies, and representatives from industry and municipalities upstream of the reservation. Sign-in sheets were available before the hearing began, and anyone interested in providing oral comments at the hearing was required to sign in. After a brief welcome and introduction, those persons were invited up to the podium in the order they signed in, and were each

allotted three minutes for comments. The full public hearing was recorded (audio), and a transcript of the hearing is provided to EPA as part of our submittal.

Summary of changes to revised WQS after public comment

A *substantive comment* is defined as an individual statement, question, or concern within a submission that substantively addresses the proposed project and that contains more than just a statement of approval or disapproval of the project. Fond du Lac received well over 500 comments in a variety of formats: written, oral, and electronic. Most of those comments, however, were provided electronically in a single format without unique or original commentary; these 466 commenters were all strongly in support of the Band's Clean Water Act authority and called out several specific changes that were incorporated in the draft revised standards which they supported. Those emailed comments, originating from Minnesota, Wisconsin, Michigan, California, Georgia, New York, Washington, Pennsylvania, Colorado, North Dakota, Maryland, Florida, Nevada and Oregon, are compiled in a text file as an attachment. Similarly, a local environmental advocacy group was tabling at a state water quality standards hearing during our public comment period, and collected 50 hard copy form comment letters in support of Fond du Lac's draft revised standards. Several examples of those form letters are attached.

Responses to EPA comments

The most substantive comments received were from EPA Region 5 staff (November 29, 2018). Fond du Lac discussed these comments in a teleconference with Region 5 water quality standards staff before beginning to consider how we would incorporate suggested changes and clarifications. Our responses to EPA's questions and suggested revisions are listed below.

1. ***Revisions to Antidegradation Implementation Procedures*.**

   EPA staff noted a discontinuity in our antidegradation implementation procedures at Sections 105(a)(2) and (4) due to a change in terminology from "high quality waters" to "exceptional resource waters" and the lack of a corresponding definition for that term in Section 201. EPA suggested clarification in the WQS to connect the definition of the new term "exceptional resource waters" and the implementation policy laid out in Section 105(a).

   Fond du Lac response: the Band incorporated suggested language changes from EPA staff, added a definition for "Exceptional Resource Waters" in Section 201, and added a reference in Section 105(b)(4) to the statement of authority in Section 105(a)(4) to more clearly establish the relationship between the two provisions.

2. ***Definitions*.**

EPA staff noted the omission of a "t" at Section 201(tt) that results in two definitions being identified as Section 201(t). Staff also inquired as to the lack of inclusion of *Zizania aquatic* along with *Zizania palustris* in the definition for wild rice.

Fond du Lac response: the typo at Section 201(tt) was corrected. *Z. aquatica* is not included in the definition for wild rice in the Fond du Lac WQS because all of the reservation's wild rice waters solely support *Z. palustris*, and any active reseeding or restoration work done in reservation waters incorporates native (on-reservation) seed sources.

3. ***Applicability of general standards*.**

EPA staff suggested an alternative approach for establishing that wetlands are explicitly included in the WQS: adding a definition in Section 201 for the term "Waters of the Fond du Lac Reservation" that includes wetlands in the definition. Staff also recommended consistency in using the term "Waters of the Fond du Lac Reservation" rather than "Reservation waters" throughout Section 301, so that the rules can be interpreted and implemented in a manner consistent with the intent of the Tribe.

Fond du Lac response: the following definition was incorporated in Section 201 –

"Waters of the Fond du Lac Reservation shall mean all waters within the exterior boundaries of the Fond du Lac Reservation, including but not limited to lakes, ponds, reservoirs, springs, streams, flowages, rivers, wetlands, and any subterranean waters having a demonstrable hydrologic connection with the surface."

Subsequent references throughout Section 301 were revised from "reservation waters" to "Waters of the Fond du Lac Reservation".

4. ***Numeric nutrient criteria*.**

EPA staff had questions and recommendations for clarification on several aspects of the Band's proposed numeric nutrient criteria. First, regarding applicability, EPA asked for clarity on whether the Band intended to establish the nitrogen, phosphorus and chlorophyll *a* values as water quality criteria or non-binding assessment thresholds, and suggested language for that case. EPA also suggested that Fond du Lac specifically identify the lakes to which these criteria apply, either through adding a definition of "Primary Reservation Fisheries Lakes" in Chapter 2, or through another mechanism for identifying those lakes.

Fond du Lac response: the Band included the EPA recommended language in Section 301(d), to clarify that our intent was to establish these values as water quality criteria.

"Waters of the Fond du Lac Reservation shall be free from nutrients (nitrogen and phosphorus) entering the waters as a result of human activity in concentrations that create nuisance growths

of aquatic weeds and algae. For the lakes listed in Appendix 5, the thresholds for nitrogen, phosphorus and chlorophyll *a* found in Appendix 5, shall be used to assess attainment of this standard, prioritize restoration projects and establish water quality targets for restoration, and inform §401 certifications."

Regarding implementation of these numeric nutrient criteria, EPA recommended that the Band specify the duration and frequency components of the nutrient values in Appendix 5, and how we intend to assess compliance with those values.

Fond du Lac response: the Band included implementation language in Section 301(d) as follows:

"The lakes listed in Appendix 5 will be considered in attainment with their nitrogen thresholds if the summer (June 1 through September 30) mean concentration for nitrogen is not exceeded. Exceedance of the summer mean total phosphorus threshold and either the summer mean chlorophyll-a threshold or the Fond du Lac Secchi disk transparency index, developed as a component of the Fond du Lac Assessment Methodology, is required to indicate a polluted condition."

EPA staff had questions regarding the Band's consideration of the status of Third Lake as "minimally impacted", even though this watershed has a history of livestock farming and the Band had implemented a manure management/alum treatment project to control internal phosphorus cycling that was contributing to nuisance algal blooms.

Fond du Lac response: Much of the science of ecological assessment depends on our ability to set expectations, against which the current condition of aquatic ecosystems can be compared.[1] The authors of this seminal article define four different aspects of reference condition as *historical condition, least disturbed condition, minimally disturbed condition, and best attainable conditions,* and propose the term "reference condition for biological integrity" or RC(BI) to represent the original concept of reference condition, and explicitly incorporating the biological-integrity modifier to be consistent with the objectives of the CWA. While these different terms have nuanced but specific differences, the reference condition conceptual framework emphasizes biological integrity as the definitive benchmark that captures the original intent of CWA efforts to maintain and/or restore biological condition to some state of 'naturalness'.

The Band purposely included Third Lake in the nutrient criteria project from the beginning with the Soranno study, as our intent was to pilot our numeric nutrient criteria development process for a single class of waterbodies (our primary fisheries lakes) before tackling other classes (i.e., wild rice waters, streams, the St. Louis River). Although human-dominated land use/cover is generally <5% in each of our study lakes, we recognized that Third Lake had historically

[1] Stoddard, J.L, D.P. Larsen, C.P. Hawkins, R.K. Johnson, and R.H. Norris. (2006). Setting Expectations for the Ecological Condition of Streams: the Concept of Reference Condition. *Ecological Applications,* 16(4), pp. 1267-1276.

experienced more anthropogenic/agricultural impacts than most of the other primary fisheries lakes, relative to its watershed size. However, our approach relied upon relating measured biological responses to nutrient concentrations, and evaluated the natural hydrogeomorphic setting of each lake, which set the stage for establishing the natural or "expected" condition of nutrients in each individual lake to which we could compare current data.

As it turned out, Third Lake numeric criteria, calculated as the 90th percentiles of summer N, P and chlorophyll *a* samples, did represent the high end of criteria in our study lakes as expected, but Simian Lake (a lake with high DOC) actually had a higher calculated TP criteria. Yet despite a water chemistry signal of somewhat higher nutrients and productivity (chl *a*) in Third Lake, the biological community that we used as our indicator of condition (algae) still exhibited the taxonomic balance ("evenness") and diversity that are indicative of good condition.

In the St. Amand study, all nine of Fond du Lac's priority fisheries lakes clustered together uniquely within the larger database of 47 Minnesota lakes, along with several of the shallower, more colored lakes of higher water quality from the larger dataset. Another important finding was that the phytoplankton communities in the Fond du Lac primary fisheries lakes were stable, exhibiting that balance and diversity across the twelve year sampling period. Those "Group 1" lakes were characterized by CP (cryptomonads and dinoflagellates) and DY (chrysophytes and planktonic diatoms) taxa, and a mix of G (chlorophytes), BG (cyanobacteria) and E/O (Euglenoids and other) taxa, with a relative low percent of HAB/HAB1 taxa (cyanobacteria that produce toxins, or 'harmful algal bloom'). In other words, the beneficial uses, including aquatic life, are being met at these nutrient and chlorophyll concentrations, and we seek to maintain that healthy condition as we establish numeric standards. Recent studies have examined the effects of taxonomic "evenness" on ecosystem functioning, suggesting it may be more sensitive to environmental change than species richness, and may better reflect contributions to an ecosystem function at any period of time by minimizing the influence of rare species.[2]

As articulated in previous discussions with EPA staff about our lake-specific approach for developing numeric nutrient criteria, the Band believed that the ecoregional nutrient criteria that the state was developing for the Northern Lakes and Forest Ecoregion did not meet our needs, particularly for our lakes that are highly stained with dissolved carbon compounds. The set of lakes used to derive the NLF ecoregional nutrient standards are primarily deep clearwater lakes that thermally stratify. Most of our reservation lakes do not stratify, and most have moderate to high dissolved organic carbon (DOC). That characteristic alone confounds the commonly observed relationship between water clarity, nutrient concentrations, and algal productivity – the long-established Carlson's Trophic State Index. As we collaborate with MPCA staff in reviewing their watershed-based monitoring and assessment process throughout this part of the state, they have also come to recognize that their ecoregional standards may not be

[2] Filstrup, C. T., K.B.S. King, I.M. McCullough. (2019). Evenness effects mask richness effects on ecosystem functioning at macro-scales in lakes. *Ecology Letters*

the appropriate numeric criteria for some lakes in each watershed that exceed those criteria but are not actually impaired (natural condition), often because this natural condition includes high DOC. For example, the MPCA recently removed Lac La Belle in the Nemadji River watershed from the draft 2020 303(d) list for nutrient impairment, using paleolimnologic data to show that this shallow lake historically had TP levels higher than the ecoregional criterion.

Most of Third Lake's relatively small contributing watershed now lies fallow, although a sediment core from Third Lake, taken before the alum treatment was implemented, showed that the lake has experienced changes and impacts from historical livestock farming and agriculture. The lake core analysis also demonstrated that the lake is returning to its pre-impacted condition. The alum treatment was a final step for addressing the legacy nutrients in the lake and has interrupted the internal phosphorus loading that had been contributing to nuisance blooms. Monitoring data from Third Lake in the years since the alum treatment show that both TP and chl *a* concentrations remain far below the calculated criteria, and the algal community remains diverse and balanced. We may want to consider, in our next triennial review, recalculating new lake-specific criteria for Third Lake using more recent nutrient and chlorophyll *a* data that represent this "improved" condition (or more specifically, lower measured productivity parameters), which we of course would strive to protect and maintain.

Ultimately, what we are seeking to accomplish with these lake-specific numeric nutrient criteria is to protect the most sensitive use (aquatic life) from degradation, recognizing the unique characteristics of each lake: depth, water clarity, contributing watershed/landscape features. We also want to utilize the rich datasets we have for these lakes. Our assumption of "minimally impacted" can be equated to fully meeting designated uses. Setting criteria that protect what is a functional, healthy ecosystem is the essential goal of water quality standards.[3] EPA has long urged states and tribes to "work expeditiously to…continue to develop numeric criteria that clearly identify nutrient levels that are consistent with a state, tribe or territory's uses of its waters under the Clean Water Act (CWA) and serve as clear guides for protecting and restoring those uses for its citizens"[4]. EPA also advocates for the benefits of adopting numeric nutrient criteria because they provide measurable water quality-based goals that are easier to implement than the narrative criteria statements in many (state) water quality standards.

These lake-specific numeric nutrient criteria are data-driven standards, derived from our long-term monitoring program and based upon multiple lines of evidence. We have combined elements of multiple approaches (classification, inference-based or reference condition; stressor/response) to determine appropriately protective criteria that can be straightforwardly assessed.

[3] 40 CFR 131.11(a)

[4] Memorandum: "*Renewed Call to Action to Reduce Nutrient Pollution and Support for Incremental Actions to Protect Water Quality and Public Health",* Joel Beauvais, Deputy Assistant Administrator, Sept. 22, 2016.

EPA staff also noted that, while the Soranno report included separate calculated nutrient thresholds for the north and south basins of West Twin Lake, Appendix 5 in the Band's draft revised WQS applied only a single set of values for West Twin Lake.

Fond du Lac response: This omission was an oversight. The calculated nutrient thresholds for both the north and south basins of West Twin Lake have been incorporated in Appendix 5. They are not statistically significantly different, but again, we want to take advantage of the rich dataset we have, and our monitoring program has maintained the dual basin sampling regime because the level of shoreland development around the north and south basin *is* different. Continuing to monitor and assess each basin separately should enable us to detect any trends more readily, and track down potential stressors.

5. ***Ammonia criteria*****.**

EPA staff noted the Band's proposed ammonia criteria specified that it was "protective of freshwater mussels". Although freshwater mussels are among the most sensitive organisms in the dataset used to calculate EPA's 2013 304(a) recommended criteria, the criteria are intended to be protective of all aquatic life. EPA recommended clarity in the Band's intent for the ammonia criteria to be protective of all aquatic life.

Fond du Lac response: the language in Section 301(f) was reworded to remove the explicit identification of freshwater mussels as the target species for protection, stating that the newly adopted criteria was based upon EPA's dataset used to derive water quality criteria to protect aquatic life from acute and chronic effects of ammonia in freshwater ecosystems.

6. ***Duration component of conductivity standard*****.**

EPA staff questioned the Band's intention for the duration component of our proposed specific conductance criterion (if the Band intended to apply the conductivity benchmark over a shorter duration than that for which it was calculated).

Fond du Lac response: it was not the intention of the Band to apply this proposed conductance criterion differently than the chronic value EPA developed based on exposures to organisms throughout their life cycle. The Band has corrected the duration component in Section 301(k) of our revised draft WQS for adoption to read as follows: "…, the specific conductance in all waters of the Reservation shall not exceed an annual average continuous exposure of 300µS/cm."

7. ***Narrative biocriterion*****.**

EPA staff recommended that the Band revise Section 301(m) to reference the specific Biocondition Gradient (BCG) models that will be used to assess biological quality in reservation streams.

Fond du Lac response: the Band incorporated the following language in Section 301(m) specifying the relevant BCG models.

"The biological quality of Reservation streams will be assessed by comparison with the Upper Midwest cool and cold water biological condition gradient (BCG) models for fish and benthic macroinvertebrate communities (Gerritsen, J. and J. Stamp. 2012. *Calibration of the Biological Condition Gradient (BCG) in Cold and Cool Waters of the Upper Midwest: Fish and Benthic Macroinvertebrate Assemblages*. Prepared for U.S. EPA Office of Science and Technology and U.S. EPA Region 5), and the Indexes of Biological Integrity (IBIs) developed by the Minnesota Pollution Control Agency for Northern Coldwater, Northern Headwaters, and Northern Stream classes (fish), and Northern Coldwater, Northern Forest Streams (Glide pool) and Northern Forest Streams (riffle run) to determine the degree to which the streams are fully, partially, or not supporting their designated aquatic life uses. (MPCA 2014b. *Development of a Fish-based Index of Biological Integrity for Assessment of Minnesota's Rivers and Streams.* Wq-bsm2-03; MPCA 2014c. *Development of a Macroinvertebrate-based Index of Biological Integrity for Assessment of Minnesota's Rivers and Streams.*"

8. ***Narrative standard for protection of wild rice*.**

EPA staff questioned whether the proposed narrative standards (Sections 301(n) and (o)) related to the protection of hydrology and habitat apply to all Waters of the Reservation or only those waters designated as wild rice areas.

Fond du Lac response: The Band intends for those broad narrative protections to apply to all Waters of the Reservation. While these particular narrative criteria originated from our intention to provide additional protective standards for wild rice waters, we also recognize that high quality aquatic habitat and natural hydrology are important characteristics for supporting and sustaining flora and fauna within all waterbody types. Our monitoring and assessment activities, along with existing and ongoing ecological research, may already provide sufficient basis and context for us to evaluate habitat and hydrologic condition in future waterbody assessments. If not, we will modify our monitoring program to incorporate appropriate metrics. We are also exploring research opportunities with USGS and other potential partners, to establish more quantitative means for defining the optimal hydrologic regime and range specifically for wild rice that we can then translate into future water quality standards.

9. ***Waters in which natural ambient water quality does not attain water quality criteria for the protection of a designated use*.**

EPA staff asked for clarification of the intent of the statement in our draft revised standards, "[d]esignated uses will not be used to control and are not invalidated by, natural ambient water quality."

Fond du Lac response: the Band was seeking to establish the importance of considering 'natural condition' or ambient water quality of our generally high-quality waters, in addition to calculated or derived 'protective' standards, in assessing whether a waterbody is attaining its designates uses or is impaired. The language used in this section was lifted directly from the Grand Portage Band's water quality standards, which EPA approved in 2005.

For example, we have several streams that support naturally reproducing brook trout (*Salvelinus fontinalis*) populations, but our continuous stream temperature data indicate that nearly every summer, the applicable temperature criterion for cold water fisheries is exceeded for periods of time. This exceedence of the standard, measured at a single point, is not a result of thermal dischargers (not human caused), and synoptic thermal stream surveys have confirmed that there are multiple thermal refugia (cold groundwater upwellings) in those streams that can provide a less stressful environment in warm weather even under baseflow conditions. The designated use (coldwater fishery) remains protected in natural or ambient conditions even though a temperature criterion is occasionally exceeded. It is not the Band's intent to either change the designated use or adopt a site-specific criterion in a situation such as the scenario described. We were simply trying to make it clear that where the biology confirms that a designated use is being met even where a water quality standard may be exceeded at the point where it is measured, in our assessment of that waterbody and designated use, we would recognize that ambient conditions are protective of and support aquatic life, rather than assume we need to "fix" a situation that is beyond our control and is not actually an impairment.

A similar example would be secchi transparency and trophic status; naturally high dissolved organic carbon in many of our lakes results in limited secchi disk transparency (depth of light penetration) and by extension, affects the calculated Carlson's Trophic State Index. This low secchi disk transparency is not, in these cases, indicative of an impaired condition as it would be if the low transparency was a result of high turbidity from excess sediments (TSS) or heavy algal blooms signaling an increase in productivity or trend towards eutrophication. It is simply a natural condition that diminishes secchi transparency without indicating a watershed or in-lake source of turbidity.

10. *Applicability of water quality standards*.

EPA staff recommended that the Band amend the revisions to Section 601 to clarify that our numeric chronic criteria apply at all times but the 7Q10 critical flow may be used to develop water quality-based effluent limits, and provided suggested language. Additionally, EPA recommended that the Band provide a definition of the 7Q10 flow in Chapter 2.

Fond du Lac response: the Band incorporated the language suggested by EPA in Section 601 as follows:

"Criteria are elements of the Fond du Lac water quality standards, expressed as constituent concentration, levels, or narrative statements, representing a quality of water that supports a

particular use. When criteria are met, water quality will generally protect the designated use. When criteria are not met, the designated uses may be affected adversely. The Fond du Lac water quality standards allow for the consideration of dilution in establishing limits on point source discharges based on numeric chronic criteria. As a result, such limits will assure ambient concentrations less than or equal to the number chronic criteria at stream flows equal or greater than the minimum 7 consecutive day average flow with a recurrence frequency of once in ten years (7Q10). However, excursions above the magnitude component of the numeric chronic criteria due to flows less than 7Q10 are not expected to adversely affect designated uses unless the duration and frequency components are also exceeded, which is unlikely to occur given the design flow."

The Band also included the following definition of the 7Q10 flow in Chapter 2:

"hhh. **7Q10** shall refer to an instream flow rate calculated as the minimum 7 consecutive day average flow with a recurrence frequency of once in ten years. The 7Q10 flow shall be calculated using methods recommended by the U.S. Geologic Survey."

11. ***Water quality criteria applicable to the wetland designated use*****.**

EPA staff recommended clarifying which set of water quality criteria found in Appendix 1 would apply to wetlands.

Fond du Lac response: The Band added the "I" classification (wetlands) to the applicable criteria tables found in Appendix 1 and Appendix 2.

12. ***Federal requirements for triennial reviews*****.**

EPA staff noted that the 2015 revisions of the federal WQS regulations require that if states and authorized tribes choose not to adopt new or revised criteria for parameters for which EPA has published new or revised 304(a) criteria recommendations, they must explain their decision when reporting the results of the triennial review. They noted that EPA has published new or updated 304(a) aquatic life criteria for cadmium and selenium (and now aluminum). Fond du Lac's proposed rules include ammonia, which is on the list of new 304(a) aquatic life criteria, but not the other parameters. To be consistent with the revised 40 CFR 131.20, for all parameters for which EPA has published new or updated 304(a) criteria recommendations since May 30, 2000 that Fond du Lac is not proposing to adopt, Fond du Lac' triennial review submission to EPA should include a discussion of whether the Tribe has adopted the 304(a) criteria recommendations and an explanation for those parameters where the Tribe has not adopted the 304(a) criteria recommendations. Additionally, EPA strongly encourages that Fond du Lac makes these explanations publicly available as part of the materials available for public review and comment.

Fond du Lac response: The Band has proposed incorporating the recommended aquatic life criteria for ammonia, to be protective of sensitive aquatic species such as freshwater mussels

that we know to be present in reservation waters. Ammonia is also a parameter that we measure routinely as part of our long term water quality monitoring program, so we currently have the ability to objectively assess whether our lakes and streams are meeting this new criterion.

Our existing approved criteria for cadmium (hardness-based) and selenium also provide thresholds for assessment. In our most recent tribal assessment report, which included submittal to ATTAINS, we report no exceedances of either of those parameters in the past ten years of data collection across all reservation waters. In fact, most lab analyses of our surface water samples reported concentrations of these two parameters below the method detection limits. We do not have an existing criterion for aluminum, nor do we measure it in our monitoring program.

However, as the reservation lies almost entirely within the Lake Superior basin, and our approved standards were promulgated to be consistent with the Great Lakes Initiative, we don't necessarily need to adopt the recommended aquatic life use 304(a) standards. In general, our metals standards for human health are more protective than the 304(a) criteria because they were calculated based upon a more restrictive fish consumption rate (60 g/day) than EPA's 304(a) standards (22 g/day) or even GLI criteria (30 g/day).

We had an extensive list of priorities to be addressed in this triennial review, and significant effort went into researching, supporting and drafting new standards and criteria for this round of updates. Our priorities this round included nutrient criteria, biological criteria, wetlands standards, ammonia and specific conductance aquatic life criteria, strengthening/clarifying our antidegradation framework, updating definitions and examining and expanding protection for wild rice under our WQS. The Band is so far along in this rulemaking process that we do not want to further delay the adoption and approval of these proposed revisions by submitting this explanation to public notice and initiating another comment period. We will commit to considering updates to these other criteria in our next triennial review process, and provide full public review and comment opportunities at that time.

Responses to other unique and substantive comments

The Band summarizes the main points of unique comments received by organizations, agencies and individuals below, along with our responses. Copies of the submitted comments and any attachments are provided in our submittal to EPA.

Minnesota Pollution Control Agency: MPCA submitted a comment letter, noting that they fully recognize and support the Band's treatment as a sovereign under the CWA and our right and

responsibility to set water quality standards. The agency also noted that as neighboring jurisdictions with different WQS, they seek to cooperate on WQS implementation issues to ensure that it is effective and efficient. MPCA also affirmed their commitment to ensuring their water quality programs take into account the water quality standards of downstream states and tribes, including Fond du Lac. Specific comments included:

- MPCA noted that the Band's proposed instantaneous specific conductance standard was based upon research resulting in a standard intended to be protective of chronic exposure, suggesting the Band either consider a chronic standard or use EPA's guidance to derive a maximum exposure concentration.

  Response: as noted in response to EPA comment #6, the Band has modified our proposed specific conductance standard to be implemented as a chronic criterion.

- MPCA noted that both the agency and the Band have supported research advancing our understanding of the impacts of sulfate on manoomin. While understanding the Band's concerns about the agency's previously proposed equation-based sulfate standard, MPCA recognized the potential for 'implementation complexities' with the differing state and tribal standards, and suggested that working together is essential for reaching agreement on monitoring manoomin health, identifying wild rice waters, and a sulfate standard.

  Response: the Band wholeheartedly agrees that tribes and state agencies should be working together on these important issues for protecting a critically important natural and cultural resource; one that is under siege from multiple threats and stressors, and one that is significantly diminished from its historic range of distribution. However, the Band's federally approved sulfate criterion, 10 mg/l, is identical to the state's existing federally approved criterion. There would be no 'implementation complexities' if the state were to fully implement their sulfate standard as the Band does, through monitoring and assessment, establishing discharge permitting limits where reasonable potential for exceedance exists, listing of impairments, and restoration of impaired wild rice waters. The research supported by both the state and the Band clearly justifies the need, reasonableness and scientific defensibility of the 10 mg/l sulfate standards.

- MPCA also noted the potential for implementation complexities in methods and approaches used to establish human health-based standards, particularly the fish consumption rate. The Band's definition of cultural uses includes subsistence fishing, hunting and harvesting (retained from original approved water quality standards; this is not a revised definition). Since tribal subsistence fishers live on- and off-reservation, the MPCA is interested in any information the Band has on fish consumption rates by tribal members in Minnesota, or any planned research of the topic, so that any new or revised state standards are appropriately protective.

Response: the Band is currently working with partners from Minnesota Department of Health, Great Lakes Indian Fish and Wildlife Commission, and the Agency for Toxic Substances and Disease Registry on an article for journal publication based upon a recent tribal health study funded under the Great Lakes Restoration Initiative. This article provides data summaries and analyses from nearly 500 tribal participants, including fish consumption rates and patterns, and explores several scenarios for health risks from eating fish from different regional sources. It also cites recent tribal fish consumption survey data from other Great Lakes region tribal communities. We are happy to share this information and the article after it has undergone peer review.

***Upstream Municipalities and Industries*:** Coalition of Greater Minnesota Cities (CGMC); Central Iron Range Sanitary Sewer District (CIRSSD), Minnesota Environmental Science and Economic Review Board (MESERB), Range Association of Municipalities and Schools (RAMS), Jobs for Minnesotans, Iron Mining Association of Minnesota, Mining Minnesota, Minnesota Miners, and others provided comments solely focused on the Band's proposed specific conductance aquatic life use standard. They generally expressed concerns for the potential need to install costly treatment technology, and urged more study (particularly collaborative study, dialog and discussion) into the science underpinning the proposed criterion and its protectiveness for aquatic life. Some commenters requested flexibility in compliance with our proposed standard, if it led to requirements for new NPDES/SDS permit limits.

Response: the Band acknowledges the concerns expressed by these upstream regulated municipalities and facilities. We are confident in the scientific basis for the specific conductance criterion we have proposed for protecting aquatic life in reservation waters, and note that it is within the Band's authority to adopt more stringent water quality standards than the state with which we share CWA jurisdiction.

We are also more than willing and interested in participating in collaborative research that would lead to the development of a regional aquatic life use standard implemented by the state. For at least the past ten years, the Band has been urging the state of Minnesota to promulgate water quality criteria to protect aquatic life use from what are now essentially unregulated pollutants. In EPA's review of the study by Johnson & Johnson, it was noted that ambient specific conductance is actually lower in the northeastern Minnesota waters for which they incorporated data, than in the Central Appalachian waters that EPA's original research and benchmark guidance was derived from. It is entirely possible that a fully protective regional criterion could be lower than what we have proposed.

As to the concerns expressed for costly wastewater treatment technology, the Band notes that our water quality standards have provisions for achieving compliance over time, through demonstrating progressive actions taken to reduce pollutant concentrations and loads. Any new NPDES/SDS permit limit would first require an evaluation of the potential for that discharger to exceed the Band's proposed specific conductance criterion, and it is not a foregone conclusion that all upstream dischargers would require a new permit limit.

Western Coalition of Arid States (WESTCAS): WESTCAS, a coalition of water and wastewater districts, cities, towns, and professional organizations dealing with water quality and water quantity issues in Arizona, California, Colorado, Nevada, New Mexico and Texas, provided comments related to their concerns for proposed salinity standards and the Band's proposed specific conductance standard for protecting aquatic life use. They noted that the EPA guidance was intended to inform the development of a chronic, not daily maximum, criterion, and that the proposed standard would result in unachievable requirements; i.e., practical treatment options are not available, or have other consequences. Their comment letter included an attachment, "Position Statement on Salinity Water Quality Regulation" (April 19, 2018), outlining their concerns for regulatory policies associated with requiring treatment for high salinity in a region with dry, ephemeral and intermittent streams, frequent drought, and high ambient salt concentrations in water supplies, and impacts for water rights obligations.

> **Response:** the Band addressed the applicability of our proposed criterion by correcting its implementation as a chronic standard. There are treatment technologies available, and there are provisions in our standards that can allow for time to achieve compliance with new permit limits through progressive actions. The Band notes that many of the regional landscape- and climate-specific issues of concern, and the legal construct of water rights raised in the WESTCAS position statement are not applicable to Waters of the Fond du Lac Reservation.

Minnesota Chamber of Commerce, Final Multi-Association Comments, the Federal Water Quality Coalition: A number of industry organizations (American Forest & Paper Association, American Iron and Steel Institute, American Petroleum Institute, Council on Industrial Boiler Owners, The Fertilizer Institute, National Association of Manufacturers, National Mining Association, National Stone, Sand & Gravel Association, Portland Cement Association, U.S. Chamber of Commerce and Utility Water Act Group), and the Federal Water Quality Coalition, a group of industry/municipalities/agriculture/trade associations directly affected by regulatory requirements under the Clean Water Act, submitted comments focused solely on the Band's proposed specific conductance aquatic life use standard. In addition to providing an extensive industry-funded critique of the Band's proposed standard and the underlying scientific investigations and guidance, their comments also questioned the statutory basis for the Band's promulgation of the proposed standard.

> **Response:** the Band appreciates the astonishing level of interest from such a wide array of industry and commerce organizations, regionally and from around the nation, in our proposed specific conductance criterion. In addition to providing their own comments, they included several extensive memos and reports from GEI Consultants, Inc., all of which were critical of EPA's scientific approach for developing an aquatic life use specific conductance criterion and Fond du Lac's reliance on that approach in proposing our criterion. Regarding GEI's disapproving review, the Band's position is that it has the authority to promulgate standards that are protective of Waters of the Fond du Lac Reservation. We have twenty years of water chemistry and biological data for those waters that confirm their existing high water quality and biological integrity, having measured specific conductance (SC) generally well below our proposed criterion of 300 µS/cm in every waterbody, with the occasional exception of the St. Louis River.

During this triennial review process, we considered how other elements of our water quality standards, specifically our antidegradation policies, correspond with the protectiveness of our numeric and narrative standards to support "Exceptional Resource Waters" status. The Band maintains it is necessary and justified to incorporate a numeric specific conductance standard explicitly for the protection of aquatic life in Waters of the Fond du Lac Reservation, because numeric standards are clear and straightforwardly implementable, and when coupled with sufficient monitoring data, provide another clear line of evidence for assessment purposes.

GEI Consultants, in their critique of the EPA guidance, asserts that the XCD method effectively sets conductivity criteria concentrations very close to natural background concentrations, "*which is not consistent with the broad ecological integrity goals of the Clean Water Act*[5]*"* (emphasis added). The Band could not disagree with this position more profoundly. Our entire water quality protection program is grounded in preserving and protecting, to the maximum extent possible, natural background conditions. We consider it our responsibility under both inherent tribal authority *and* delegated federal CWA authority, to assure nondegradation of our generally very high quality waters.[6] That is how we fundamentally interpret the 'broad ecological integrity goals of the CWA'.

GEI and other commenters also asserted that the Band failed to follow proper procedures in the development of the specific conductance standard. The Great Lakes Initiative or GLI methodologies at 40 CFR Part 132 Appendix A for establishing water quality criteria to protect aquatic life generally apply to 29 environmentally persistent pollutants (bioaccumulative contaminants of concern or "BCCs") that accumulate in the food web and pose a threat to the Great Lakes System. The two-tiered methodology therein establishes the application of the final Guidance to develop aquatic life use criteria for all listed pollutants *except* those listed in Table 5 of part 132, "Pollutants Subject to Federal, State, and Tribal Requirements". States and Tribes do not have to adopt and apply the final Guidance methodologies and procedures for the 14 pollutants listed in Table 5 of part 132, which includes 'salinity' - essentially equivalent to specific conductance in that it represents a measure of dissolved anions and cations. EPA believes that some or all of the GLI methodologies or procedures are not scientifically appropriate for these pollutants. A State or Tribe may use alternate methodologies or procedures so long as they meet all applicable Federal, State and Tribal laws[7].

GEI claims that the EPA framework "gives no consideration to diversity or abundance or other straightforward means of evaluating overall health of aquatic communities, even though diversity is a well-established means of evaluating benthic invertebrate community health and

[5] *Review of EPA's Draft Field-Based Methods for Developing Aquatic Life Criteria for Specific Conductivity*, prepared on behalf of the National Mining Association by GEI Consultants; submitted to Docket ID No.: EPA-HQ-OW-2016-0353, April 2017; included as attachment to comments from multiple stakeholders as file "geifonddulacconductivityreport2018"

[6] *See,* e.g. Fond du Lac Water Quality Standards, Section 105(a)(1) and (a)(3)

[7] *Final Water Quality Guidance for the Great Lakes System*, 40 CFR part 132

structure.[8]" This statement appears to conflate establishing water quality criteria with assessment methodologies; the two paradigms are interrelated but not identical. Our robust water quality monitoring program generates comprehensive physical, chemical and biological data for implementing our water quality standards through assessing compliance with our narrative and numeric standards, which in turn are protective of our designated uses. We are proposing several new numeric water quality criteria in this triennial review process, not just for specific conductance, which will all be implemented as thresholds for assessing attainment of aquatic life use in Waters of the Fond du Lac Reservation. Our assessment methodology also incorporates biological metrics (some also newly proposed in this triennial revision) that verify condition and structure of our lake and stream biological communities, including benthic invertebrates. The proposed specific conductance criterion is simply one more clear line of evidence; one that is easy and inexpensive to measure.

The commenters also cited their consultant's technical review of the EPA *Draft Methods*[9] (one of the guidance documents utilized by the Band in proposing our criterion) as having determined that the guidance was inherently flawed, and therefore does not provide a reliable means for ensuring protection for 95% of the benthic aquatic community as earlier foundational EPA guidance[10] for aquatic life criteria intends.

The Band is fully cognizant of the distinction between the XC_{95} approach and the traditional laboratory toxicity tests for surrogate species traditionally used to derive acute and chronic effects concentrations. It appears that the industry and commerce organizations and their consultants only give credence to those controlled laboratory toxicity tests used to derive toxicity-based standards ("toxic substances in toxic amounts"). These were among EPA's earliest established empirical approaches for deriving numeric water quality criteria protective of aquatic life, human and wildlife health, and there certainly is an extensive track record demonstrating their utility. But controlled laboratory toxicity tests are not the only, or necessarily the most protective, method for determining ecologically relevant assessment endpoints or criteria. They are short term and limited in scope; they do not take into account full life cycle exposure, or seasonal and long term cumulative effects, at either the genera or community level. The Band carefully considered EPA's *Draft Methods* approach, and agree with the Agency that, because it is based on biological surveys, it is inherently relevant to the streams where it may be applied[11], and represents the actual aquatic life use in those streams. Additional advantages are that this method incorporates all life stages and the ecological interactions among many species; it represents the actual exposure conditions for elevated

[8] GEI, April 2017

[9] *Draft Field-Based Methods for Developing Aquatic Life Criteria for Specific Conductivity*. EPA-822-R-07-010, December 2016, referred to as *Draft Methods*

[10] *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses* (1985) (EPA/822/R-85/100)

[11] The benchmark is applicable to mixtures of ions dominated by salts of Ca^{2+}, Mg^{2+}, SO_4^{2-} and HCO_3^- at a circumneutral to alkaline pH.

conductivity in the ecoregion, the actual temporal variation in exposure, and the actual mixture of ions that contribute to salinity as measured by conductivity.

The salt mixture dominated by salts of SO_4 and HCO_3 is believed to be an insurmountable physiological challenge for some species.[12] Some commenters maintained that it would be more appropriate to promulgate separate criteria for individual ions. However, the ionic composition of mixtures of salts affects their toxicity[13], and a measure such as conductivity is necessary because the effects of the salts are a result of the magnitude of the exposure and the relative proportion of all of the ions in the mixture – not to one individually (*EPA Benchmark Report*). Unless an individual ion occurs at a much higher concentration relative to its toxicity than other ions, the individual ion would not be the only potential cause of adverse effect, and a benchmark based on an individual ion could be under-protective.

EPA's *Draft Methods* defines assessment endpoints (macroinvertebrate genera) and the measure of effect (extirpation, or the effective absence of such genera from a site). It derives relationships for each macroinvertebrate genus and for the overall aquatic community. A genus extirpation concentration (XC_{95}) for specific conductance (SC) that is determined from a weighted cumulative distribution function for each genus defines the level of exposure above which a macroinvertebrate genus is effectively absent from waterbodies in an ecoregion or study area (*EPA Benchmark Report*); in other words, there is a 5% probability that a genus would be observed (present) above its XC_{95} SC value. Secondly, the HC_{05} (hazard concentration 5th centile) is developed using a genus-level extirpation concentration distribution (XCD) for the community from the aggregation of the XC_{95} values. The HC_{05} is a chronic-duration endpoint and can be used for a derivation of a criterion continuous concentration (CCC) because it is derived from biological field data that integrates exposure over whole life cycles and multiple generations of the resident biota. EPA used the extirpation concentration as the effects endpoint because it is easy to understand that an adverse effect has occurred when a genus is lost from an ecosystem.

EPA's 1985 *Guidelines* and the *EPA Benchmark Report* informed the field-based method (*Draft Methods*) for specific conductance. A field data set was used to first estimate a numeric SC benchmark for Appalachian streams; EPA then validated that method and benchmark with an independent data set. The analyses and method were subject to extensive internal and external review, including by EPA's Science Advisory Board[14], with favorable results. The *Draft Methods* uses the same approach to estimate a protective CCC for chronic or long-term exposures, and provides additional methods to estimate a maximum exposure concentration protective of

[12] *A Field-Based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams* (EPA/600/R-10/023F), U.S. EPA 2011a. (referred to as *EPA Benchmark Report*)

[13] Mount, DR; Gulley, DD; Hockett, R; et al. (1997) Statistical models to predict the toxicity of major ions to *Ceriodaphnia dubia*, *Daphnia magna,* and *Pimephales promelas* (fathead minnows). Environ Toxicol Chem 16(10):2009−2019.

[14] *Review of field-based aquatic life benchmark for conductivity in Central Appalachian streams.* Washington, DC: Science Advisory Board, Office of the Administrator. EPA 2011(c).

acute toxicity (a criterion maximum exposure concentration or CMEC) using stream water chemistry data. It also provides recommendations for SC criterion duration and frequency. Four case studies provide examples of how these methods may be applied to develop such criteria in different ecoregions with different background SC and data sets. Just as surrogate aquatic taxa are needed for the minimum required data set in laboratory-based aquatic life criteria, the macroinvertebrate taxa in the case studies are surrogate taxa that represent a potentially exposed aquatic community. The Band defers to EPA's determination that these draft field-based methods were indeed adapted to be consistent with the intent of the Agency's traditional approach to deriving aquatic life criteria (EPA 1985), which are designed to protect aquatic species in a community (i.e., 95%).

Other comments from this group and their consultants included criticism of the differing responses of genera to increasing SC, and the observation that other confounding variables may be contributing to the lack of sensitive taxa in streams with high SC. In the *EPA Benchmark Report*, the Agency clarifies that an invertebrate genus may represent several species, and their approach identifies the pollutant level that extirpates *all sampled species within that genus* (the level at which the least sensitive among them is rarely observed). The researchers note that although species within a genus respond similarly to toxicants, different species within a genus could have evolved to partition niches afforded by natural occurring causal agents such as conductivity.[15] Hence, an apparently salt tolerant genus may contain both sensitive and tolerant species. The *EPA Benchmark Report* includes a causal analysis of the stressor-response relationship, and a confounder analysis that explores the potential influence of habitat, water quality factors, other pollutants and other factors. The causal analysis (also found in *Draft Methods*, Appendix A) concludes that the available evidence indicates that salts, as measured by conductivity, are a common cause of impairment of aquatic macroinvertebrates in the region of concerns.

Ephemeroptera were selected as an effect endpoint for the confounder analysis (also found in *Draft Methods*, Appendix B) that allowed the researchers to evaluate a greater range of exposures and confounding factors than occurs for individual genera, and because they are among the most sensitive genera. The confounder analysis found the effects of confounders to be minimal and manageable. Additionally, it supports Appendix A by demonstrating that none of the potential confounders is responsible for the association between conductivity and biological effects. Second, it supports the development of the benchmark value by determining whether the confounders have substantive influence on the causal relationship between salts and macroinvertebrate assemblages. Twelve potential confounders were evaluated: habitat, organic enrichment, nutrients, deposited sediments, pH, selenium, temperature, lack of headwaters, catchment area, settling ponds, dissolved oxygen, and metals.

[15]Suter, GW, II. (2007) Ecological risk assessment, 2nd edition. Boca Raton, FL: CRC Press.; see also Remane, A. (1971) Ecology of brackish water. In: Remane A; Schlieper, C, eds. Biology of brackish water. New York, NY: John Wiley and Sons.

After extensive internal and external peer review of the *EPA Benchmark Report*, and validation of the method and benchmark using an independent data set, the method and results of its application were published.[16,17,18] The *Draft Methods* document uses that method and provides additional methods to estimate a protective maximum exposure concentration, duration and frequency; it also presents a draft method for assessing applicability of field-based SC criteria developed in geographic area to another area. In 2014 and 2015, panels of five external experts selected independently by an EPA contractor reviewed the additional draft methods. The field-based methods are tailored to derive SC criteria on the scale of Level III ecoregions[19], in order to account for natural differences in background or ambient ionic concentrations among ecoregions.

The regional analysis[20] prepared by Bruce and Maureen Johnson was designed to answer two questions:

1. Are the methods used by USEPA to develop a specific conductance aquatic life use benchmark for Appalachian ecoregions applicable in developing specific conductance aquatic life protections for ecoregions in Minnesota? (primary reference was *EPA Benchmark Report*) and
2. Is the 300 µS/cm guidance developed by EPA for the Appalachian ecoregions directly applicable as a maximum aquatic life benchmark for northeastern ecoregions 50n, the northern portion of 50p and 50t or as a Minnesota NPDES permit conditions when sufficient background data is available?

Bruce Johnson is a biologist/chemist with 30 years' experience in water quality research (USEPA), mining research with the MN Department of Natural Resources, mine permit enforcement with the MN Pollution Control Agency, and NPDES compliance with MN Department of Transportation. He also served as the field chemist in charge of the metal pathways portion of the MN Regional Copper-Nickel Study[21] in the 1970's. Maureen Johnson is a biologist with 26 years' experience in water quality sampling and analysis (USEPA, US Forest Service), and managing hazardous waste site cleanups for the MPCA. Their professional

[16] Cormier, SM; Suter, GW. (2013a) A method for deriving water-quality benchmarks using field data. Environ Toxicol Chem 32(2):255−262; see also Cormier, SM; Suter, GW. (2013b) A method for assessing causation of field exposure-response relationships. Environ Toxicol Chem 32(2):272−276.
[17] Cormier, SM; Suter, GW; Zheng, L. (2013a) Derivation of a benchmark for freshwater ionic strength. Environ Toxicol Chem 32(2):263−271; see also Cormier, SM; Suter, GW; Zheng, L; Pond, GJ. (2013b) *Assessing causation of the extirpation of stream macroinvertebrates by a mixture of ions.* Environ Toxicol Chem 32(2):277−287; also Cormier, SM; Wilkes, SP; Zheng, L. (2013c) Relationship of land use and elevated ionic strength in Appalachian watersheds. Environ Toxicol Chem 32(2):296−303.
[18] Suter, GW, II; Cormier, SM. (2013) A method for assessing the potential for confounding applied to ionic strength in Central Appalachian streams. Environ Toxicol Chem 32(2):288−295.
[19] Omernik, JM. (1987) Ecoregions of the conterminous United States. Ann Assoc Am Geograph 77:118−125.
[20] *An Evaluation of a Field-Based Aquatic Life Benchmark for Specific Conductance in Northeast Minnesota* (November 2015), prepared by Bruce L. Johnson and Maureen K. Johnson for WaterLegacy
[21] State of Minnesota, *Regional Copper-Nickel Study*, 1976-1980, a collection of research papers located at the Minnesota Legislative Reference Library, www.leg.state.mn.us/lrl/lrl.asp

credentials and experience are extensive and relevant to the examination of this issue. Their study was not intended to be a comprehensive review of all data sources in the ecoregion. It was intended to demonstrate that significant paired water chemistry and biological data exists, and little new data would be needed to support Minnesota's development of a numeric specific conductance benchmark or standard at least as stringent as the Appalachian benchmark, to protect aquatic life use in the area of study. The specific data they used for their evaluation was from locations entirely within Level III Ecoregion 50; they reported the location of those data more specifically as within several Level IV ecoregions, which form a portion of the Northern Lakes and Forest Level III Ecoregion 50. Fond du Lac Reservation lies entirely within Ecoregion 50.

Johnson & Johnson corroborated the applicability of the *Draft Methods* (ionic mixture dominated by bicarbonate and sulfate anions, calcium and magnesium cations). They reported the *mean* background SC of 68 µS/cm from their ecoregional data set, which is lower than the 25th centile SC of the data set used in the central Appalachian benchmark. They also provided evidence that where SC is elevated, there is disturbance, particularly downstream of mining discharges. Finally, they provided evidence that benthic invertebrates are adversely affected where SC is greater than background (diversity and abundance decrease, and proportion of dominant genera increases).

Dr. Susan Cormier, National Center for Environmental Assessment, USEPA Office of Research and Development and primary author of the *EPA Benchmark Report*, *Draft Methods*, and related peer-review journal articles published on these methods, found additional validation for the findings of Johnson & Johnson study[22]. She agreed that the weight of evidence supports the inference that effluents that increase waterbody SC to more than 300 µS/cm have adverse effects in northeast Minnesota waters, and using effect levels developed in central Appalachia, more than 5% of the shared genera are likely to be extirpated in waters with SC >300 µS/cm. Dr. Cormier then used independent data sets that had been provided by MPCA for national stressor-response research to confirm the Johnsons' findings. Using the 25th centile of all samples from the MPCA data set (1996-2013), she estimated background SC for the entire Level III Ecoregion in Minnesota – which has the lowest background SC among all ecoregions in the state.

While the Johnson & Johnson study did not calculate effect levels for individual genera in northeast Minnesota streams (they used the X_{95} values from the Appalachian study and evaluated only genera present in both study regions), Cormier's review incorporated paired biological and SC data from Ecoregion 50 in Minnesota, and could directly calculate X_{95} levels for benthic invertebrate genera in northeastern MN streams. Using Ecoregion 50-Minnesota X_{95} values, she predicted the SC at which 5% of the benthic invertebrate genera are likely to be extirpated or HC_{05}. Applying the EPA method to this MPCA Ecoregion 50 data set, the interpolated 5th centile of the ranked XC_{95} (i.e., the HC_{05}) is 320 µS/cm, similar to the

[22] Cormier Review, February 4, 2016.

Appalachian HC_{05} of 295 µS/cm. Cormier notes that most of the MPCA samples in her evaluation dataset were collected in August/September, and may have missed some salt-intolerant genera (the *EPA Benchmark Report* includes an analysis of seasonal bias in sample diversity). Therefore, the estimated HC_{05} from Cormier's review may be higher than would be obtained with a data set that included more mayfly genera, which are collected in the spring and tend to be among the more intolerant genera.

In summary, Cormier concluded that:

- Johnson & Johnson's finding that background SC in Ecoregion 50 in Minnesota is lower than background SC in the Appalachian Ecoregions 69 and 70, and that a benchmark value for SC in Ecoregion 50 is not expected to be greater than the Appalachian benchmark (i.e., 300 µS/cm).
- The inference that 5% extirpation would occur at similar conductivity levels in Appalachia and Ecoregion 50 in Minnesota was supported by analysis of an independent data set.
- The severity of biological effects of elevated SC in Minnesota streams, as reported by MPCA, is consistent with effects expected for increased SC.
- Confounders such as metals contamination, habitat alteration, temperature, and nutrient enrichment may be contributing to biological effects at mine-impacted sites in northeast Minnesota, and may exacerbate the effect of elevated SC, but extirpation due to SC would still occur if these stressors were removed.

The Band maintains that the EPA guidance and its underlying peer-reviewed research which the Johnson & Johnson analysis applied, coupled with the EPA scientific expert's review of their study, provide a sufficiently rigorous and scientifically defensible basis for the proposed criterion. Further, we are already prepared to implement this new standard for Waters of the Fond du Lac Reservation. Our monitoring program generates sufficient data for the Band to incorporate this proposed criterion as a threshold value in future assessments of aquatic life use.

Allete (Minnesota Power)*:* Minnesota Power submitted comments calling into question the science and rationale behind the Band's proposed specific conductance standard and lake-specific nutrient criteria. They noted that a certain level of conductivity is required for freshwater aquatic life, and offered that some published studies have revealed that ion deficiency can induce acute and chronic toxicity in freshwater organisms. MN Power also noted that the specific conductance standard, as developed from the Central Appalachia study, should be a chronic criterion rather than instantaneous.

Response: the Band not only relied upon the Appalachian benchmark study and the Johnson and Johnson regional study, but also EPA's affirmative review of the Johnson & Johnson study. We are satisfied that the overall level of rigor and peer review supports the scientific basis for our proposed specific conductance standard. Regarding concerns about insufficient or imbalanced 'beneficial ions', the Band relies upon its twenty years of data collection in reservation waters demonstrating healthy and diverse biological communities thriving in ambient specific conductance levels ranging from as low as 20 µS/cm to ~280 µS/cm in all

reservation waters except, on occasion, the St. Louis River. As noted previously, the Band has made the change to our proposed specific conductance standard to be implemented as a chronic value.

MN Power also questioned the supporting technical documentation for the Band's proposed numeric nutrient criteria for primary fisheries lakes, and suggested that the Band rely upon numerous published, peer reviewed studies available.

Response: the Band stands behind the work represented in both the Soranno and St. Amand studies, which were funded through EPA specifically for the purposes of utilizing our extensive water quality monitoring data to develop tailored, protective numeric nutrient criteria for a subset or specific class of reservation lakes. Additional explanation and rationale is presented in our response to EPA's question #4 about the appropriateness of our approach for deriving lake-specific standards for Third Lake.

***WaterLegacy*:** WL submitted a comment letter in support of the Band's draft revised standards, signed onto the Minnesota Environmental Partnership conservation group letter supporting the Band's revised WQS, and also provided separate technical drafting comments on the revisions. The attachments primarily addressed the Band's proposed specific conductance criterion for the protection of aquatic life, and deemed it a reasonable and necessary application of ecoregion-specific evidence, federal guidance, and peer-reviewed science, consistent with the CWA and the Band's sovereign authority. The technical comments addressed the broader draft revised standards, and included questions and recommendations for definitions and/or additional clarity.

Response: the Band appreciates WaterLegacy's support for our proposed revised water quality standards, and the technical drafting comments which the Band took under consideration and made the following revisions:

- Added a separate definition in Section 201 for the term "Alterations" for clarity
- Added clarifying language in the definitions of "Existing Discharger" and "Expanded Discharger", to be more consistent with federal regulations at 40 CFR 122.2, and explicitly including discharges of pollutants to hydrologically connected groundwater
- Added definition for "Exceptional Resource Waters" and made appropriate changes throughout ordinance for consistency (same response as to EPA comment #1)
- Added language to the Wildlife designated use (Section 302 B.) to establish that wild rice also serves as food for the support and propagation of wildlife

***Minnesota Center for Environmental Advocacy*:** MCEA submitted comments in support of the Band's draft revised standards, finding them to be reasonable and scientifically-based, and recommending that USEPA approve the revised standards. In particular, MCEA called out the modifications to Sections 301(n) and 302 (narrative protections for cultural uses, including wild rice); Section 301(o) (narrative standards maintaining natural hydrology); Section 301(k) (numeric aquatic life use specific conductance standard); Section 301(f) and Appendix 4 (numeric aquatic life use ammonia criteria); Sections 102(d),

105(b)(3) and 105(b)(4) (additional antidegradation provisions and Exceptional Resource Waters); and Section 302 and chapter 7 (Wetland Designated Use and Antidegradation).

MCEA also offered two suggestions:

- Section 105(c) add "or other pollutants" after reference to BCCs to ensure the conditions for Antidegradation Demonstrations are consistent with the implementation in Exceptional Resource Waters; and
- Sections 105 (c) and 201(z) replace "high Quality Waters" with "Exceptional Resource Waters" for consistency with 105(b)(4).

Response: the Band appreciates MCEA's support for our proposed revised WQS, and incorporated both of those suggestions, to improve consistency.

Minnesota Environmental Partnership: The organizations who submitted comments as the Minnesota Environmental Partnership (MEP) included CURE (Clean Up the River Environment), Friends of the Mississippi River, Izaak Walton League of America Minnesota Division, League of Women Voters – Duluth, League of Women Voters – Minnesota, Mankato Area Environmentalists, Minnesota Ornithologists Union, Minnesota Well Owners Association, MN350, Northeastern Minnesotans for Wilderness, Pollinator Friendly Alliance, Renewing the Countryside, Save Lake Superior Association, Save Our Sky Blue Waters, Sierra Club North Star Chapter, St. Croix River Association, and WaterLegacy.

MEP expressed strong support for the Band's proposed revised WQS and our exercise of tribal sovereignty and delegated authority under the CWA, and strongly endorsed the work of the Band to protect water quality, aquatic life, wildlife, human health and cultural resources consistent with the most current data and scientific analysis. MEP recommended that U.S. EPA promptly approve the revised WQS to protect reservation waters, allow for more scientifically-based review of impacts of upstream pollutants on water quality in the St. Louis River, and set an example for the state of Minnesota which has been slow to protect state waters from ionic pollutants.

MEP specifically called out the new narrative standards for protecting wild rice and other cultural resources (water quantity, water quality and habitat), the new aquatic life use specific conductance and ammonia criteria, the numeric nutrient criteria and biological assessment thresholds for streams as being needed and reasonable. They also expressed support for the new antidegradation language and the proposed new wetland water quality standards, noting the current science emphasizing wetland functions of carbon sequestration and climate change resiliency as well as our ecosystem services study on the St. Louis River watershed as demonstrating the need and reasonableness for wetlands WQS. (http://www.fdlrez.com/RM/downloads/Earth%20Economics%20St%20Louis%20River%20Project%20Report.pdf)

Response: the Band appreciates the support expressed by the Minnesota Environmental Partnership and undersigned organizations for our revised water quality standards.

Grand Portage Band of Lake Superior Chippewa: the Grand Portage Band submitted a comment letter vigorously supporting Fond du Lac's exercise of sovereign authority to protect water quality within reservation boundaries. GP specifically called out the new ammonia aquatic life use criterion, the new wetlands water quality standards, the new specific conductance aquatic life use criterion, and new assessment methods for supporting aquatic life use designations for aquatic insects and fish. GP also acknowledged the additional documentation supporting the Band's proposed revised WQS related to the economic benefits and health impacts of wild rice water quality standards, confirming the importance and appropriateness of our existing federally approved wild rice sulfate standard.

> **Response:** the Band appreciates Grand Portage's support for our revised water quality standards.

W.J. McCabe (Duluth) Chapter, Izaak Walton League of America: the Ikes Chapter sent comments expressing strong support for the Band's updated standards, acknowledging our desire to protect the water quality of the St. Louis River, the wild rice lakes, streams and wetlands of the reservation. They noted that protecting reservation resources also benefits the surrounding communities and the water quality of the St. Louis River and Lake Superior, especially important because of the ongoing threat of mining impacts in the headwaters of the river. They stated their support for specific rule changes, including: prohibiting changes in water level or habitat alterations that would impair wild rice and other culturally important resources; the proposed specific conductance and ammonia aquatic life use criteria; applying current science to prevent excess nutrients and algae blooms; increasing protection of wetlands and water quality from degradation. Noting that reservation waters flow into both the Lake Superior and St. Croix River watersheds, they appreciate our work and partnership to protect water quality in the region.

> **Response:** the Band appreciates the McCabe Chapter, Izaak Walton League of America's support for our revised water quality standards.

***Bruce Johnson & Maureen Johnson*:** The Johnsons, co-authors of *An Evaluation Of A Field-Based Aquatic Life Benchmark For Specific Conductance In Northeastern Minnesota*, submitted comments in appreciation of the Band's inclusion of the specific conductance aquatic life use criterion and our citation of their study as support for the criterion. They noted that the specific conductance standard they calculated, and that EPA reviewed, may be appropriate for NE MN in general, but that it may not be strict enough to protect waters with naturally lower specific conductance such as we have on the reservation. They also provided several other recommendations for consideration, including changing all references of "High Quality Waters" to "Exceptional Resource Waters", noting two typos, and offering suggestions for clarifying processes dealing with acute and chronic mixing zones in a permit, and authority to assess penalty and/or cost of environmental damage as consequence to violation of a variance.

> **Response:** the Band appreciates the work that the Johnsons have done to evaluate the applicability of EPA's method for developing a protective specific conductance standard for this ecoregion in northeastern Minnesota. We addressed the language consistency for "High Quality

Waters" vs. "Exceptional Resource Waters" and corrected the two typos. We considered the suggested language for mixing zones and authority to assess penalty for violation of a variance, and have added that language to the specific sections as below:

Section 901 (Applicability), added item (d.): Any permit with acute or chronic mixing zones shall define such zones using at a minimum maps showing measurements in feet or meters from established discharge points. Seasonal sampling confirmation of the effectiveness of acute and chronic mixing zones shall be provided by the permittee on a quarterly or monthly basis. If toxicity is indicated, it shall be considered a trigger to conduct the tests to determine the source(s) of toxicity within seven (7) days, and to require action to return to compliance within thirty (30) days.

Section 908, added item (f.): Authority is provided to assess penalty and/or cost of environmental damage as a consequence to violation of the variance that is under the permittee's control.

The Band believes this additional language adds clarity and specificity to the requirements for including a mixing zone in a permit, and explicitly states the permitting agency's authority to assess penalties should a violation of a variance occur. At this point, these issues are essentially academic; there are no NPDES permits for dischargers on the reservation now that have mixing zones or variances associated with their permits. But it makes sense to anticipate that could change in the future, and this language in the WQS ensures specific actions, requirements and authorities apply.

Howard Markus: Mr. Markus, retired professional engineer who worked for the MPCA, cited his experience in developing WQS, triennial reviews, developing TMDLs, and use of constructed wetlands as treatment in his comments in support of the Band's proposed revised WQS. He reviewed the requirements for setting and revising water quality standards, particularly as they relate to a tribe's ability to set standards that are protective of cultural and traditional uses, and to utilize their CWA delegated authority to ensure that tribal resource rights are considered. His summary concluded that the Band has met the requirements of the CWA in terms of establishing appropriate water quality standards that protect beneficial uses, including nutrient WQS and toxics WQS, and that they have used the needed science to establish limits.

Response: the Band appreciates Mr. Markus' oral and written comments in support of our revised water quality standards.

François Médion: Mr. Médion, Duluth citizen, noted that he and his family live downstream of the reservation in the St. Louis River watershed and 1854 Ceded Territory, and is directly affected by the management of upstream waters by the Band and mining operations up on the Iron Range. He noted multiple environmental challenges (global climate change, loss of biodiversity, aquifer depletion and more) we face, and that traditional indigenous cultures have consistently tried to raise warnings about our interdependence with "our relations" (the natural world) and the need to slow, stop and reverse human degradation of the environment. He advised that we should think about industry upgrades and

environmental regulations as opportunities that will open new economic sectors. In summary, he commends the Band for forward-thinking leadership in environmental care and natural resource management, and offers unconditional support of our proposed WQS revisions.

> **Response:** the Band appreciates Mr. Médion's comments in support of our revised water quality standards.

The Band received nearly a dozen other unique emails from several citizens and groups, as follows:

(1) My name is Alyssa Dykstra. I live in the downstream community of Sandstone.

Yesterday I listened to the voices of community members speak to the Tribal Council in support of Fon Du Lac's revised water quality standards. There were nearly 50 concerned community members gathered.

Today I am writing to add my voice of support to the revised water quality standards. I am writing for me, and I am writing for my one-year old daughter. Clean water is essential for healthy growth and life. Clean water is precious. In this moment in history, WATER is one of our greatest resources. To protect it is to ensure the success of our region and people.

Thank you for your time.

(2) To Whom It May Concern:

I am writing to share my support for strengthening the water quality standards. When I write, "To Whom It May Concern," it really is all of us who depend on healthy water. This change will help protect that water, wild rice, fish, and other species from further contamination. This is also a direct way to insist that if PolyMet moves forward with the proposed mine, that PolyMet is held accountable and responsible for keeping the water clean.

My friend, Alyssa Dykstra, listened to voices of community members speak to the Tribal Council in support of Fon Du Lac's revised water quality standards. There were nearly 50 concerned community members gathered. She shared about this with others who could share their support.

Today, I am adding my voice of support to the revised water quality standards.

I am writing for me, and I am writing for my children, and all the children to come. Water is life. Water is sacred. Without realizing our interdependence with water and all it gives, nurtured and sustains, we are surely lost.

Thank you for your time and consideration.

Jen Johnson
Luck, WI

(3) Greetings,

I'm a resident of Duluth, MN and wanted to just very simply say that I fully support Fond du Lac's revised water quality standards as well as the Band's right and ability to alter these standards as they see fit for the health of people and natural resources.

Thank you,

Kevin Malmquist
419 N 79th Ave W
Duluth, MN 55807

(4) Hello.

As a downstream resident from Finlayson, I'm writing to voice my support of the Font du Lac tribal council's request for the revised water quality standards.

While I recognize the need for jobs in northern MN, we must not sacrifice our water resources for the future. Flint Michigan, the Lake Erie fires, and countless other water disasters in our nation's history adequately illustrate the vital importance of preserving strict water quality standards for this and future generations. The planet has very little safe, clean fresh water left. Let us not degrade ours further in the name of profit.

Please, as a father to a 2 year old son and someone who chose northern MN over southern MN to raise my family for the exact issue of water quality, support the stricter revised water quality standards.
Thank you,

Jason Misik
Finlayson, MN

(5) My name is Hannah Bernhardt. I am a farmer at Medicine Creek Farm outside of Finlayson, MN where I live and raise grass fed beef and lamb with my husband and toddler son. I am writing in support of Fon Du Lac's revised water quality standards.

I was raised on a conventional corn and soybean farm in southern Minnesota and, as such, am acutely aware of the preciousness of our water quality. I grew up swimming and fishing in creeks and lakes that are no longer safe to swim in or eat from due to fertilizer and herbicide run off. Now as a beginning farmer, I have returned to my agricultural roots with the mission to do things differently; to care for the soil, the wildlife, and our water using rotational grazing practices that regenerate our ecosystem rather than destroy it.

When I was making the decision to start farming, I consciously chose not to take over my family's land, and instead sought land in a part of the state where my son could swim and fish as I had growing up. We are doing our best to take care of the land we now own, yet we know we are also connected through our watershed to communities up stream and how they choose to care for their water.

We commend Fon du Lac for protecting this essential resource and considering the effects of water quality on the communities around them, and we urge the EPA to enact the revised water quality standards.

Thank you for your time.

Hannah Bernhardt
68393 Scotch Pine Road
Finlayson, MN 55735

(6) My name is Deborah Dougherty and I live outside of Finlayson Mn on the Pine River.

I am aware of the impact water has on my life, my health, the wild life, the land, and the beauty of the world around me.

I have reviewed your revised water quality document and support these ideas as a way to improve and maintain water quality.

Thank you for caring and the good work you are doing. Thank you also for your leadership.

Sincerely,
Deborah Dougherty

(7) My name is Brenna Doheny. I am an environmental health scientist living in the rural Sandstone/ Hinckley area.

Members of my community have told me about the efforts being made by the Fon Du Lac tribe to improve water quality standards, and I want to express my support. Protecting water quality is essential to healthy environments and human health. Water resources are precious and will only continue to

become more valuable with the impacts of climate change. To ensure the survival of our species and the planet, we must prioritize clean water above other economic considerations.

Thank you for your time.

Brenna Doheny, PhD
Hinckley, MN 55037

(8) Dear Ms. Schuldt,

My property is on the Cloquet River. I've cared for it, paid taxes on it, and received very little in return from St. Louis County, the state, or anyone else. I've had trespassers, break-ins, and arsonist burn down my place over the years I've had it. No one helped me protect it. My taxes meant nothing. "Investigations" were slipshod, and half-assed. No results.

I've protected the property, kept it clean and unpolluted. I haven't "developed" it to further my wealth.

I feel angry at my government representatives, buckling under to the s***hole developers being allowed in, even from foreign countries, to exploit everything. (It's o.k. to say s***hole, because we allow a pretender to our presidency to use it.) I'm fighting angry over what MY government is allowing in 'collusion' with those greedy people whose only interest is in getting richer. They are filthy people.

I don't want to see my Earth scraped and raped just so some low-life scum can afford gold fixtures on his toilet.

Show some guts. Say no to the people trying to exploit and ruin, and risk permanent damage to the Earth, air, and water that provides us the means for life itself. You can't eat gold, for gods' sake.

I support everything the Fond du Lac Ojibwe People are trying to do, not just for themselves, but for all of us.

I support the revised water quality standards proposed by the Fond du Lac Band of Lake Superior Chippewa in September 2018.

Thank you,

Al J. Martin
27518 County Road 3

Merrifield, MN 56465

(9) Dear Ms. Schuldt,

I am terribly afraid of the new proposed standards for water quality. I realize that great care needs to be taken concerning our waters. The proposed standard would put a tremendous undue hardship on communities and industry, or life as we know it. I would like to see a coming together of all entities affected, to draft a terrific plan that would work for all concerned. What could be better than thriving tribes and communities in which we live while protecting our greatest natural resource. Thank you.

Sincerely

Susan and Rudy Scufsa. Winton, MN

(10) Dear Ms. Schuldt,

I am writing to support the revised water quality standards proposed by the Fond du Lac Band of Lake Superior Chippewa in September 2018. These standards will protect water quality on the reservation and ensure the sustainability of resources that are important to tribal culture and to all Minnesotans.

I appreciate the work that the Fond du Lac Band has done to protect water resources in the Lake Superior Basin. I live on the Fond du Lac Reservation and I want clean water for myself and my family. I hope that Minnesota state officials will also take steps to strengthen water quality standards and protect our habitats and communities from pollution.

Thank you,
Danielle Lake Diver
Cloquet, MN 55720

Response: the Band appreciates that these individuals have provided their perspectives as we consider our triennial revisions to our water quality standards.