Triennial Review: Responses to Comment and Federal Rule Revision

1. Federal Rule Revision: In August of 2015, EPA revised 40 CFR Part 131 to require that states, during their triennial review of water quality standards, either adopt EPA's Clean Water Act §304(a)criteria recommendations or explain their decision not to adopt the criteria.

Response: The new or updated Clean Water Act §304(a) criteria for the following parameters are not proposed for revision at this time for the following reasons:

Aluminum

In 1988, EPA recommended expressing the value for aluminum in the water column as the total recoverable fraction or as an acid-soluble fraction to protect aquatic life. Prior to 1995, the state of Montana adopted the dissolved fraction of aluminum as the water quality criteria (MT DEQ, 2012). DEQ is currently in the process of evaluating data gaps, research needs, complexities and implications of the total recoverable aluminum criteria fraction as a water quality standard. Stakeholder input will be incorporated in to this process.

Ammonia

DEQ is currently studying the most recently recommended ammonia criteria as outlined in the publication EPA 822-R-13-001 Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater, 2013 and its implication to the state. DEQ has identified substantial implementation challenges associated with adopting EPA's current criteria for ammonia.

The implementation challenges are technical, social and economic. The technical difficulties surround understanding the complex science of ammonia, the probable effectiveness of alternative treatment options, and identifying the natural biological communities. The social and economic challenges are primarily, though not limited to, developing a workable strategy that combines the science with applicable and affordable options to achieve compliance for the smaller publically owned treatment works (POTWs).

Ultimately, DEQ must protect the waters of the state and their aquatic communities. To reach this end, the department has an obligation to implement criteria that are protective and possible to achieve. To address its responsibility to protect state waters and its obligation to implement protective and achievable criteria, the department is developing a list of strategy options to accompany the future potential adoption of the ammonia criteria. Strategy options currently being explored include:

(1) BMPs to achieve best ammonia, TN and TP removal from wastewater lagoons: DEQ commissioned a report (completed 5/2015) to identify available technologies, best management practices (BMPs), and optimization methods for increasing ammonia (NH3), total nitrogen (TN), and total phosphorus (TP) removal efficiencies of facultative lagoon systems in Montana. Emerging, innovative technologies were reviewed along with more established methods. All technologies were evaluated in their overall ability to remove ammonia, total nitrogen, and total phosphorus, as well as site specific limitations and performance criteria related to Montana. No single technology or approach was found to be optimal; rather, several technologies and BMPs were offered up as having very good potential, depending upon the site-specific characteristics of the lagoon and the community. For example, a technology showing promise for ammonia removal is floating barriers along with mechanical aeration. Both of these practices can be added to existing lagoons. A User's Guide was also developed which can be used by lagoon

operators to assist them in selecting the most appropriate approach for their situation. DEQ is working with 2 communities in 2016/17 to pilot selected technologies, BMPs, and optimization methods in their lagoons. Water quality improvements resulting from the changes will be monitored and reported upon at a later date. The report and the User's Guide are available on DEQ's website at: http://deq.mt.gov/wqinfo/srf/WPCSRF/technicalassistance.mcpx

(2) Re-calculate ammonia criteria for specific aquatic life: Ammonia criteria are toxicity-based, and are calculated by EPA using groups of organisms intended to represent the overall aquatic community. Therefore, under federal rules, ammonia criteria may be calculated based on the sensitivity of the organisms that actually exist or are desirable within a waterbody. Thus a different, and less stringent, ammonia criterion might be developed for waterbodies where specific fauna and age classes are naturally absent, and where organisms, which are less sensitive to ammonia, are present. Specifically, the absence of mussels, and the absence of early life stages of fish during certain times of the year may result in a higher criteria for ammonia than ammonia criteria that are based on broad assumptions of the presence of aquatic fauna.

(3) Collect better pH and temperature datasets for receiving waters: Permits are currently developed on relatively small pH and temperature datasets collected from the receiving waterbody. Collecting more accurate, longer-term pH and temperature datasets from receiving streams will be beneficial. Potentially, ammonia permits could then be written to reflect seasonal pH and temperature patterns (i.e., different limits for summer, fall, winter, and spring runoff). Evaluations show that ammonia concentrations would be more relaxed in fall, winter, and spring, compared to summer. DEQ training of operators in calibration and use of low-cost pH meters and temperature monitoring using low-cost units would be essential to this strategy.

(4) Understanding mixing-zones: Presently, the Department allows small fractions of the 7Q10 flow for mixing with ammonia standards. The 7Q10 is a relatively low flow, and mixing zone fractions of 7Q10 flow drastically cut the volume of water available for mixing. Understanding the science behind the appropriate mixing may provide for higher low flow volumes. These fractions could then be revisited to see if higher values (e.g., 100%, 40%, 10%) available for mixing may protect aquatic life and still prevent "toxics in toxic amounts" on a case-by-case basis.

(5) Include appropriate compliance schedules in permits: 75-5-401(2), MCA gives DEQ authority to grant permittees compliance schedules. Compliance schedules allow permittees to come into compliance with a water-quality based effluent limit (WQBEL) over time. DEQ policy has required compliance schedules to require full compliance with the WQBEL within one permit cycle (5 years). Scenarios may exist where longer compliance schedules, with regular review, may be necessary.

(6) Provide opportunity to request a variance: A variance from a water quality standard is an appropriate tool when there is certainty that the water quality criteria are accurate (see 2 above) and designated uses are appropriate and accepted. If these prerequisites are met, an individual permittee may request a variance supported by an individual economic demonstration that shows the permittee cannot afford to improve treatment to comply with the criteria. The variance and justification would be reviewed regularly and adjusted if economic conditions change, affordable technology improvements are available, or ambient water conditions improve.

(7) Review stream classification and designated uses where needed: DEQ could request that the Board of Environmental Review change the underlying classification of stream reaches downstream of lagoons which release ammonia at concentrations above current or future standards. The reclassification would require a public process to identify existing and future uses for the waterbody. A reclassification example might be re-designating uses from "aquatic life" to a subclass of aquatic life such as "marginal aquatic life tolerant of ammonia," with associated ammonia standards reflecting instream ammonia concentrations as influenced by the lagoon.

Methyl mercury

In 1995, EPA recommended an aquatic life water quality criterion for methylmercury as the dissolved metal in the water column. In 2001, EPA recommended a human health water quality criterion as a concentration in fish and shellfish tissue rather than in the water column. DEQ is currently in the process of evaluating how the criteria can be implemented as a water quality standard. Stakeholder input will be solicited and incorporated into this process.

Selenium

EPA released freshwater aquatic life water quality selenium criterion guidance in June, 2016. There are fish tissue and water column components to this suggested criterion. EPA is in the process of developing implementation guidance to accompany this document that will be released in the fall of 2016. DEQ is eager to review these guidelines and learn how EPA suggests implementing this criterion, particularly with regard to what level of protection (i.e., 95% at the species level) to fish the EPA recommends, how to implement this in averaging periods, etc., and how to reflect this in NPDES permit limits (likely as a water column number). In addition, there are many more questions Montana has about best implementation practices for this criterion. For example, DEQ is investigating the most analytically sound way to obtain dry weight selenium concentrations from a fish tissue plug, in cases where the fish will not be sacrificed.

DEQ is currently developing selenium site-specific criteria for Lake Koocanusa and may apply the suggestions from the selenium technical subcommittee on implementation across the state.

2. Comment: Montana continues to utilize the total recoverable metals standard for measuring the impact of metals in water bodies. This standard was developed in the 1980s. However, in the 1990s, USEPA issued guidance that a dissolved metals standard more accurately and precisely measures the bioavailability of metals and thus more realistically measures the potential risk to fish and other aquatic life from metals (i.e. Arsenic). The total dissolved metals standard has been adopted by most other states. Since then, USEPA has also developed models that predict how and whether site-specific conditions in water bodies (i.e. acidity) impact bioavailability. MT continues to cling to an outdated and imprecise water standard that is 20 years out of date.

Add a new footnote to the acute and chronic copper aquatic life criteria entries in Circular DEQ-7 that would state: "Freshwater copper criteria may be calculated utilizing the procedures identified in EPA's Aquatic Life Ambient Freshwater Quality Criteria – Copper (2007), EPA-822-R-07-001."

Response:

On October 1, 1993, the U.S. Environmental Protection Agency (EPA), Office of Water recommended dissolved metals criteria to be adopted instead of total recoverable criteria as the State Water Quality Standard for metals to protect aquatic life. In the same memorandum, EPA maintained its position that

the total recoverable fraction (TR) published under the 304(a) of the Clean Water Act is scientifically defensible and specified that it will approve individual state's risk management decisions to keep the total recoverable fraction as the water quality standard. The State of Montana adopted the total recoverable fraction as the water quality standard to protect aquatic life and human health, with the exception of aluminum which is expressed as the dissolved fraction (MT DEQ, 2012). In 2007, EPA issued a revised national recommendation for copper aquatic life criteria using the copper biotic ligand model (BLM) for those who wanted to use this approach (EPA 2007).

For the BLM, ten characteristics of the receiving water are necessary as inputs to the model (temperature, pH, dissolved organic carbon (DOC), major cations (Ca, Mg, Na, & K), major anions (SO4 & Cl), alkalinity, and sulfide). Whereas for the dissolved metal fraction, only two factors are necessary to implement the water quality standard: Factor one relates to the fact that the EPA's section 304(a) criteria for metals are expressed as total recoverable (TR) metal fraction, not as dissolved requiring a conversion factor (EPA 1996) to express the total recoverable fraction as a dissolved fraction; Factor two relates to Federal regulation 40CFR 122.45(c), which requires metal permit discharges to be expressed as total recoverable, not dissolved making, a translator factor necessary to determine the dissolved fraction of the total recoverable fraction in the fully mixed receiving water. This translator factor can be greatly influenced by temperature, pH, hardness, total suspended solids (TSS), particulate organic carbon (POC), dissolved organic carbon (DOC), acid volatile sulfides (AVS) as well as concentrations of other metals and organic compounds. A test of the parameters per site that influence the translation factor and development of the correspondent regressions to calculate the translator is the best approach. Other approaches have been used as interim measures in the absence of site specific information and conservative assumptions can be made. These approaches can be found in the EPA guidance document on how to develop a translator factor (EPA, 1996).

Although the dissolved fraction is more bioavailable to aquatic life, aquatic organisms are subjected to metals contamination from factors other than water. Dissolved fractions move with surface water and groundwater flows, interact with other compounds (ligands) to form complexes that reduce the apparent toxicity of the dissolved metal and adsorbed to sediment particles. Both the BLM and the dissolved fraction provide only estimates of water column toxicity. Ingestion of contaminated sediment is a pathway for aquatic organisms, therefore the use of sediment metals standards when using the BLM model or the dissolved metal fraction as water quality standard (WQS) is recommended (EPA, 1993). At present, there are not sediment standards, only guidance values. The total recoverable fraction is a more conservative approach but includes the particulates, which minimizes the need for a complementary sediment standard.

DEQ is currently in the process of evaluating data gaps, research needs, complexities and implications of the BLM and the dissolved fraction as a water quality standard. Stakeholder input will be incorporated to this process when the time arrives to present the findings.

In the absence of these findings, the Board is not adopting use of the BLM in Montana and is not adopting the footnote suggested by the commenter. However, under Montana Code Annotated §75-5-310, a permit applicant, permittee, or person potentially liable under any state or federal environmental remediation statute may petition the Board of Environmental Review to adopt site-specific standards of water quality for acute and chronic life. The board's decision to adopt site-specific standards must be based on sound scientific, technical, and available site-specific evidence.

References:

EPA. 2007. Aquatic Life Ambient Freshwater Water Quality Criteria – Copper – 2007 Revision. EPA 822-F-007-001. U.S. Environmental Protection Agency, Office of Water. Washington, D.C.

EPA.1988. Ambient Water Quality Criteria for Aluminum. . EPA 440/5-88-008. U.S. Environmental Protection Agency, Office of Water. Washington, D.C.

EPA. 1996. The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion. EPA 823-B-96-007. U.S. Environmental protection Agency, Office of Water. Washington, D.C.

EPA. 1993. Memorandum from Martha Prothro, Acting Assistant Administrator for Water. To: Water Management Division Directors. Subject: Office of Water Policy and technical Guidance on interpretation and Implementation of Aquatic Life Metals Criteria. U.S. Environmental Protection Agency, Office of Water, Washington, D.C.

MDEQ. 2012. Circular DEQ-7. Water Quality Planning Bureau, Water Quality Standards Section. Montana Department of Environmental Quality, Helena, MT.

3. Comment: DEQ cannot continue to force POTWs to shoulder all the burden and cost of cleaning up the lakes, rivers and streams. The millions more spent to reduce total nitrogen and further limit phosphorous contributions at the POTWs will have little to no effect to the quality without addressing the other sources of contamination. You will price the POTW's out of the business of keeping the rest of the pollutants out of our environment when people choose to located just out of reach of the community wastewater collection systems and put in septic systems and gravel roads.

Response: It is important to note that the Board has not adopted any lake standards so far, but has adopted river and stream nitrogen (N) and phosphorus (P) standards. Rationale for adoption of numeric nutrient standards for rivers and streams need to be considered apart from lakes.

Rivers and Streams: Data indicates both nitrogen and phosphorus need to be regulated in order to properly control eutrophication in flowing waters. Co-limitation appears to be especially common in flowing waters, where nutrient-addition experiments show that added N and P result in much greater response of algal growth than does N- or P-addition alone (Elser et al., 2007). In the Clark Fork River, at locations where both the N standard and the P standard have been met (20 µg TP/L and 300 µg TN/L) algal biomass has usually been reduced below nuisance levels (≤150 mg Chl*a*/m^2). Locations in the Clark Fork River where these nutrient levels have not been met continue to have elevated algae biomass, and study sites give mixed signals regarding nutrient limitation—some suggesting N limitation, others P; these signals are not consistent across time or location (Suplee et al., 2012). In DEQ's whole-stream fertilization study (in an eastern Montana stream), soluble reactive phosphorous (SRP) was increased by only 1 µg/L above ambient background (bringing the stream concentration from 3 to 4 µg SRP/L), while nitrate was increased from 3 µg N/L (background) to 39 µg N/L. This caused significant changes in daily DO patterns, proliferations of Cladophora mats, etc., and the changes were essentially due only to the increased nitrate, since background P was hardly changed at all (Suplee et al., 2016). Stated simply, limiting nutrient levels are not fixed and both nutrients are likely to limit some facet of the algal community at any point in time. If, for example, P is presently limiting in a stream, that does not mean there is no point in limiting N. If P were to increase, say from summer rain events, or due to the

confluence of a downstream tributary with slightly higher P concentrations, the N that was formerly in excess can become the limiting nutrient without any change in its absolute concentration.

Lakes: Phosphorus control in lakes has been widely successful in reducing lake eutrophication. Lakes, in general, are more consistent than rivers and streams in regards to which nutrient limits algal production. Regarding Flathead Lake, DEQ met with stakeholders in 2014 and 2015 about the development and adoption of numeric nutrient standards for the lake. At these meetings DEQ has made it clear that P is the nutrient which needs to be most closely regulated, while the appropriate standard for N needs further discussion and thoughtful consideration. Although P reduction has been very successful in cleaning up already-eutrophied lakes, it should be noted that Flathead Lake is still a very clean, oligotrophic lake, and the Flathead Lake Biostation has consistently recommended that standards for P and N be adopted for Flathead Lake in order to properly protect it.

POTWs: The increasing price of community wastewater fees needs to be given careful consideration. To this end, rules, policies and DEQ programs have been crafted to address nutrients coming from sources other than POTWs. For example, the 20-year period over which nutrient standards variances are in place not only allows dischargers time to make improvements in wastewater treatment, but also allows time to institute trading arrangements with nonpoint sources of nutrients, and for DEQ (and others) to better address nonpoint sources of nutrients. DEQ's nonpoint source program is constantly looking for opportunities to fund projects to reduce diffuse nutrient sources from agriculture, etc. TMDLs developed around the state include a load allocation to nonpoint source, and these documents are often the starting point for working in watersheds where nonpoint sources of nutrients need to be addressed.

References

Elser, J. J., M. E. S. Bracken, E. E. Cleland, D. S. Gruner, W. S. Harpole, H. Hillebrand, J. T. Ngai, E. W. Seabloom, J. B. Shurin, and J. E. Smith. 2007. Global Analysis of Nitrogen and Phosphorus Limitation of Primary Producers in Freshwater, Marine and Terrestrial Ecosystems. Ecology Letters. 10(12): 1135-1142.

Suplee, Michael W., Vicki Watson, Walter K. Dodds, and Chris Shirley. 2012. Response of Algal Biomass to Large Scale Nutrient Controls in the Clark Fork River, Montana, U.S.A. Journal of American Water Resources Association. 48: 1008-1021.

Suplee, M.W., Sada, R.H., Feldman, D., and G.Bruski. 2016. Whole-stream Nitrogen and Phosphorus Addition Study to Identify Eutrophication Effects in a Wadeable Prairie Stream. Helena, MT: Montana Dept. of Environmental Quality. Available at: http://deq.mt.gov/Water/WQPB/standards/numericnutrientcriteria

4. Comment: Commenter supports retaining Maximum Contaminant Levels (MCL) where they are more stringent than the Section 304(a) criteria. Commenter does not recommend that the MCL be used where consideration of available treatment technology, costs, or availability of analytical methodologies has resulted in a MCL that is less protective than a Maximum Contaminant Level Goal (MCLG).

Response: All 94 updated 304(a) criteria considered. Where the MCLs were more stringent than the 304(a) criteria, DEQ retained the MCLs. Changes to non-304(a) human health criteria based on MCLs are not proposed in the current rulemaking. In future rulemakings, DEQ and the Board will continue to

consider how best to protect Montana's water quality in accordance with state and federal regulation.

5. Comment: Commenter recommends clarifying which water quality criteria apply to which designated uses.

Response: There are many areas where the designated uses and/or criteria that apply to a water body are not clear. With 17 water-use classes and 23 distinct but often very similar uses, it is impossible to provide clarification without changes to the structure of our water uses and use classes. Therefore, DEQ will research and address this issue over the next several years, ultimately providing clarity through a proposed new surface water use class structure for Board action.

6. Comment: Commenter recommends improvements to Montana's nondegradation rules such as:

- Defining significance thresholds in terms of significances rather than nonsignificance,
- Defining significance thresholds in terms of assimilative capacity rather than the magnitude of the proposed increase,
- Revising significance thresholds to ensure only insignificant degradation is allowed under exceptions to review of high quality water bodies, and
- Adopting a cumulative cap on the use of total assimilative capacity.

Response: Montana's nondegradation rules should be reviewed. Montana's nondegradation rules are used not only by the Montana Pollution Discharge Elimination System program, but also by other programs throughout DEQ, such as the groundwater and subdivisions programs. Therefore, modifications to the rules will require an understanding of potential impacts to more than just Clean Water Act administration. The research and amendments necessary to revise and clarify the nondegradation rules will require several years of planning and outreach. Potential revision of Montana's nondegradation rules will be addressed in a future rulemaking.

7. Comment: Commenter requests consideration of adoption of a broad narrative to protect downstream WQS.

Response: DEQ participated in the national workgroup that developed the customizable templates for a narrative downstream use protection standard. During this process Montana and many other states shared concerns on how such a narrative standard would be implemented within water quality programs. Montana is looking forward to seeing technical guidance to support how such a broad and generic standard is implemented. When this information is available we will be able to determine how to proceed.

8. Comment: Commenter recommends that efforts regarding water quality standards and natural conditions meet EPA's public participation requirements and be submitted to EPA for review/action.

Response: New and revised water quality standards will meet public participation requirements of 40 CFR Part 131 and 40 CFR Part 25 and will be submitted to EPA for review/action under CWA 303(c).