

**Date:** November 7, 2008  
**To:** Tina Laidlaw  
**From:** Michael Paul  
**Subject:** Montana Stream Nutrient Criteria White Paper Review

As the lead contractor for EPA's nutrient criteria development efforts, Tetra Tech manages EPA's Nutrient Scientific Technical Exchange Partnership and Support (N-STEPS) system. Through the N-STEPS program, Tetra Tech organizes independent technical reviews of state nutrient criteria efforts by national experts involved in nutrient work.

EPA Region 8 requested an independent review of the technical merits of Montana's proposed approach for developing nutrient criteria for Wadeable Streams. Montana Department of Environmental Quality (MDEQ) provided materials describing their proposed approach and Michelle Baker (Utah State University), Walter Dodds (Kansas State University), and Jeroen Gerritsen (TetraTech) served as the technical review experts. Tetra Tech facilitated the review process.

Reviewers provided informal detailed comments to MDEQ followed by a conference call on 20 October, 2008 to discuss the comments and to explore the technical considerations in greater detail. This memo summarizes the content of the review and subsequent discussion.

**Comments:**

All three reviewers unanimously expressed their appreciation of the scientifically rigorous, well documented, thoughtful, and thorough nature of this document. As a result, the reviewers expressed confidence that the procedures presented in the document would result in defensible nutrient criteria. The reviewers essentially endorsed Montana's approach and felt it offered a sound scientific basis for developing nutrient criteria for Wadeable Streams.

Dr. Michael Suplee of MDEQ identified the common themes raised by the reviewers for discussion on the conference call. These issues are discussed briefly below. MDEQ had the opportunity to respond to these technical comments during the conference call and to explain how MDEQ is addressing these issues.

**Total Nutrient Standards related to organic and inorganic pollution:** One reviewer commented on MDEQ's development of criteria for total nutrient species while, at the same time, stressing the importance of dissolved inorganic species in the document.

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Their concern was that total nutrient measures capture, substantially at times, organic nutrient species. The consensus of the call was that the issue was not technical in nature but primarily an issue of semantics. Montana intends to re-write this section of the document to clarify the intent and reduce the apparent conflict.

Criteria for Plains streams: Reviewers felt the strength of evidence for criteria in the Plains region was not consistent with efforts in other regions and recommended strengthening the basis for the proposed criteria. They felt that other lines of evidence could be added, specifically other stressor-response studies from the region and the addition of distribution-based values from least disturbed reference sites. MDEQ prefers not to use distribution-based values alone since their work has focused on setting nutrient criteria at levels demonstrating harm to the beneficial use. Stressor-response based analyses generally provide the basis for these values.

The state agreed that it would be valuable to include information on nutrient values for the Plains and present results from any relevant studies that can be found. The state will make an effort to summarize nutrient thresholds derived from relevant Plains stressor-response studies and least disturbed reference values in the white paper. The paper by Wang et al. 2007 was suggested as one from which appropriate tables can be drawn and Dr. Walter Dodds will also send some materials from his work related to this issue.

Use of anti-degradation to protect high quality waters: The reviewers stressed that the stressor-response analyses used to set criteria at concentrations associated with response thresholds may not adequately protect higher quality waters. MDEQ responded that they have anti-degradation statutes in place that require authorizations to degrade for discharging into high quality waters once concentrations exceed 50% of criteria values. They also stated that all National Parks and Wilderness Areas are outstanding natural resource waters (ONRWs) and that there are procedures for classifying other waters as ONRWs in MT, through the legislature. No degradation is allowed in ONRWs.

Classification Approach: The reviewers felt the paper's presentation of the various classification approaches tested by MDEQ (Section 4.0) was confusing. MDEQ noted that a goal of this report was brevity, and that extraneous discussion of classification could be removed or reduced and instead focus on the methods that were indeed used.

Nitrate Criteria: Reviewers expressed concern that nitrate criteria were presented for the prairie region but not in other regions. They agreed that total species are commonly used for setting criteria but commented that the state is justified in using inorganic species if they are more protective. MDEQ felt that the Plains region was one most susceptible to dissolved inorganic nitrogen problems, but agreed to recommend dissolved inorganic criteria for other regions as well.

Values Below the Detection Limit: Reviewers asked for more detail describing how MDEQ handled values below the detection limit in their analyses. MTDEQ treated

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these values as one-half the detection limit. A concomitant requirement was that non-detects had to constitute less than 15% of the total sample size, consistent with USEPA recommendations.

Consideration of Downstream Uses: One reviewer asked how MDEQ considered downstream uses in development of nutrient criteria, wondering if there might be a threat to reservoirs or lakes given the stream nutrient criteria recommended in the white paper. MDEQ responded that the criteria were developed primarily with adjacent (i.e., proximate) beneficial uses in mind. However, lake and reservoir criteria are slated for development next and these could, in certain cases, result in more stringent criteria for upstream waters. Additionally, any nutrient criteria established for a downstream lake/reservoir or as part of TMDLs would constrain upstream criteria.