RECORD OF DECISION ADDENDUM

New Mexico's Standards For Interstate and Intrastate Surface Waters 20.6.4 NMAC

The purpose of this addendum is to explain the Environmental Protection Agency (EPA's or the Agency's) decision on those provisions of New Mexico's ***Standards for Interstate and Intrastate Surface Waters* 20.6.4. NMAC** that EPA did not act on as part of its previous April 12, 2011 decision. EPA's decisions are based on a detailed review of supporting documentation for these provisions, discussions and correspondence with the State.

20.6.4.10 D. Site-specific Criteria

Federal regulations allow States the flexibility to modify EPA's 304(a) criteria to reflect site-specific conditions. Given this premise, EPA initially approved the majority of section **20.6.4.10(D) Site-specific Criteria** and took no action on subsection **20.6.4.10 (D)(1)(e)** because of specific concerns with that subsection of the provision. After additional analysis, EPA determined that section **20.6.4.10(D)** represents implementation procedures and does not constitute water quality standards that require the EPA's review or action under Section 303(c) of the Clean Water Act (CWA). Since the provisions in this section are not water quality standards, EPA has determined that it has no obligation to act on these provisions and as a result, rescinds that prior action. Section **20.6.4.10(D)** remains in effect for purposes of State law and may be used for the development of site-specific criteria; however, it is not a water quality standard that is effective for CWA purposes.

Although EPA is not approving the procedures in section **20.6.4.10 (D)** as water quality standards, we retain authority to act on site-specific criteria developed using these procedures. Given this authority, it is important that the State understand our concerns with subsection **20.6.4.10 (D)(1)(e)**. In a plain reading of this subsection, it is unclear what the reference to "...other factors or combinations of factors that...may warrant modifications of default criteria" means or how it will be applied or implemented. In an effort to determine the meaning and intent, EPA referred to the hearing record, the Commission's Statement of Reasons and the Hearing Officers Report. All referenced assurances from the New Mexico Environment Department (NMED) to 3rd-party petitioners that the Commission would consider "net ecological benefit" in establishing site-specific criteria. Given this, EPA believes it is important to reiterate the position outlined in comments provided to NMED that were included as Exhibit_89 in the State's hearing record and subsequent submission. As explained in those comments, the "net ecological benefit" concept is not supportable from an ecological perspective and is not consistent with federal regulations. As such, EPA is unlikely to approve site-specific criteria based on a net ecological benefit concept.

20.6.4.13 J. Turbidity

EPA believes that when this provision regarding criteria for turbidity was initially adopted, it was intended to address potential degradation from sources of turbidity expressed as numeric total dissolved solids values. Although the amendments were intended to provide some clarity, EPA's concern has been that if implemented as written, the provision could allow long-term or permanent degradation. However, EPA believes that if this provision is implemented consistent with the antidegradation policy and implementation contained in the State's standards and antidegradation implementation procedures in its Continuing Planning Process (CPP) and/or related documents, the amended provision is consistent with the CWA and the EPA's implementing regulations at 40 CFR 131. As a result, EPA approves the new and revised language in this provision with the understanding that – as with all of the State's water quality standards -- it will be implemented consistent with approved antidegradation policy and procedures in the State's standards and its CPP.

The State is currently addressing the effects of imbalances in suspended and bedded sediment on aquatic life uses through narrative or comparative standards found in section 20.6.4.13 NMAC, which include this turbidity provision. There is significant variability inherent to turbidity data and the degree that natural and anthropogenic sediment loads affect aquatic life are not specifically defined. As a result, Region 6 and NMED staff have been working towards developing benchmarks for bedded sediment by site class to better implement the existing narrative criterion. The analyses are to identify sediment characteristics that are expected under the range of environmental settings in New Mexico, especially in undisturbed reference streams. Through this characterization, it will be possible to identify situations where the expectations are not met, using sediment indicators that show responsiveness to disturbance. Associating biological measures with sediment indicators will further indicate situations where the disturbance causes biological imbalance and habitat degradation. EPA believes that the results of these analyses will aid in establishing quantitative sedimentation benchmarks on New Mexico perennial streams in future standards revisions.

20.6.4.900 I. (1) Acute and (2) Chronic Hardness-based Metals Criteria

<u>Aluminum:</u>

New Mexico has adopted revised criteria for aluminum based on a proposal from a 3rd-party, Chevron Mining, Inc. The rationale and methods used to derive the proposed criteria were presented in a report prepared by GEI Consultants, Inc. The Commission adopted hardness-dependent equations for aluminum (based on analysis of total recoverable metal):

$$\text{Acute} = e^{(1.3695[\ln(\text{hardness})]+1.8308)}$$
$$\text{Chronic} = e^{(1.3695[\ln(\text{hardness})]+0.9161)}$$

These hardness-dependent equations were derived through a recalculation of the toxicity database for EPA's 1988 Aluminum Criteria Document and newer studies published since the criteria document's publication. In the initial review, EPA identified concerns with the approach

taken in the development of these recalculated criteria and conducted a detailed review to determine the appropriateness of applying these criteria statewide.

Based on our detailed review and correspondence with the State, EPA noted concerns with the selective exclusion and inclusion of specific studies that were used in the recalculation, including the use of non-native species. EPA learned that the recalculated criteria were derived by GEI as if they were an update to the national criteria. Although GEI generally followed methods outlined in EPA's criteria derivation and recalculation procedures (Stephan et al. 1985, USEPA 1994), since these updates are submitted by the State, EPA views them as State, not national criteria. As such, EPA recommends the use of indigenous species in the development of criteria intended to apply statewide.

Given that the implementation of metals criteria is complex due to the site-specific nature of their toxicity, the detailed review was also intended to determine if it would be appropriate to apply these recalculated values statewide. The studies GEI utilized were carried out over a pH range of 6.5 to 9.0. EPA previously established this pH range as an optimal in ambient freshwater (USEPA 1976), it is not reflective of the pH range that will be seen in all waters in New Mexico. Although GEI recognized the inverse toxicity and hardness relationship (within the pH range of 6.5 to 9.0) in the development of the acute equation, it does not appear that the significant effects that site-specific factors such as pH have on metals and particularly on aluminum toxicity were fully considered in applying these equations as statewide criteria. The pH significantly influences speciation and/or complexation of aluminum at low pH and should have been considered carefully in determining if these recalculated values would be appropriate when adopting these values as statewide criteria.

Given the significant variability in both pH and hardness in waters in New Mexico, EPA does not believe that these hardness-based equations are appropriate as a basis for statewide criteria and may not be protective of beneficial uses in all waters of the State. EPA has determined that the hardness-based equations would be protective for waters within the pH range of 6.5 to 9.0, particularly at low hardness levels, but would not be protective for waters below that pH range. Therefore, EPA is approving the hardness-based equation for aluminum for only those waters of the State where pH is equal to or greater than 6.5, but is disapproving these equations in waters where the pH is less than 6.5. To resolve this disapproval, EPA recommends that the State adopt a footnote for these equations specifying the following:

> "Where pH is equal to or greater than 6.5 in the receiving water after mixing, the chronic hardness-dependent equation will apply. Where pH is 6.5 or less in the receiving water after mixing, either the 87 µg/l chronic total recoverable aluminum criterion or the criterion resulting from the chronic hardness-dependent equation will apply, whichever is more stringent."

In the interim, for waters of the State where pH is 6.5 or less, in the receiving water after mixing, EPA will apply the 304(a) recommended 87 µg/L chronic dissolved aluminum criterion.

Cadmium:

New Mexico has adopted revised criteria for dissolved cadmium based on a proposal from a 3rd-party, Chevron Mining, Inc. The rationale and methods used to derive the proposed criteria were presented in a report prepared by GEI Consultants, Inc. The Commission adopted hardness-dependent equations for cadmium (based on analysis of dissolved metal):

Acute = $e^{(0.8968[\ln(hardness)]-3.5699)}$ CF: 1.136672-[(ln hardness)(0.041838)]
Chronic = $e^{(0.7647[\ln(hardness)]-4.2180)}$ CF: 1.101672-[(ln hardness)(0.041838)]

EPA identified concerns with the approach taken in the development of these recalculated criteria during its detailed review in an effort to determine the appropriateness of applying these recalculated criteria statewide. In this review, EPA concluded that there were concerns with the supporting documentation for the hardness-based cadmium criterion, specifically the use of a non-native species arctic grayling (T. arcticus) and juvenile rainbow trout (O. mykiss) as representative of the most sensitive life stage. In correspondence with the State, GEI indicated that it considers the fact that non indigenous species were used to be irrelevant because this update was to the national criteria. Since these updates are submitted by the State, EPA views these updates as State, not national criteria. As such the use of non indigenous species is not recommended in the development of criteria intended to apply statewide. However, EPA believes that overall, the new hardness-based equation will be adequately protective of the applicable designated use for all waters of the State. Therefore in today's action, EPA is approving the new hardness-based equation for cadmium.

Zinc:

New Mexico has adopted revised criteria for zinc based on a proposal from a 3rd-party, Chevron Mining, Inc. The rationale and methods used to derive the proposed criteria were presented in a report prepared by GEI Consultants, Inc. The Commission adopted hardness-dependent equations for zinc (based on analysis of dissolved metal):

Acute = $0978e^{(0.9094[\ln(hardness)]+0.9095)}$ CF: 0.978
Chronic = $0.986e^{(0.90947[\ln(hardness)]+0.6235)}$ CF: 0.986

In our detailed review of the supporting documentation for the hardness-based zinc criterion, EPA noted the lack of a clear explanation on patterns between final acute/chronic ratio (FACR) values and acute values as consistent with EPA's 1985 Guidelines, as well as the confusing presentation of data on the acute/chronic ratio (ACR) values. GEI provided an adequate response concerning the FACR values and confusing data presentation. As a result, EPA believes the new hardness-based equation is adequately protective of the applicable designated use for all waters of the State. Therefore in today's action, EPA is approving the new hardness-based equation for zinc.

Literature Cited

GEI Consultants, Inc. Ambient Water Quality Standards for Aluminum – Review and Update, July 2009.

GEI Consultants, Inc. Ambient Water Quality Standards for Cadmium – Review and Update, August 2009.

GEI Consultants, Inc. Ambient Water Quality Standards for Zinc – Review and Update, August 2009.

State of New Mexico, Quality Control Commission – Statewide Water Quality Management Plan and Continuing Planning Process (2011).

State of New Mexico, Water Quality Control Commission - Transcript of Proceedings. WQCC-08-13(R) Volume 1 (2009).

State of New Mexico, Water Quality Control Commission - Hearing Officer's Report. WQCC-08-13, (2010).

State of New Mexico, Water Quality Control Commission - Order and Statement of Reasons for Amendment of Standards. WQCC-08-13 (2010).

Stephan, C.E., D.I. Mount, D.J. Hansen, J.H. Gentile, G.A. Chapman, and W.A. Brungs. 1985. Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses. PB-85-227049. U.S. Environmental Protection Agency, Office of Research and Development, Duluth, Minnesota.

U.S. Environmental Protection Agency (USEPA). 1994. *EPA Interim Guidance on Determination and Use of Water-Effect Ratios for Metals*. EPA-823-B-94-001. Office of Water, Washington, DC.

U.S. Environmental Protection Agency (USEPA). Quality Criteria for Water, PB-263 943. Red Book (1976)

U.S. Environmental Protection Agency (USEPA). 1988. Ambient Water Quality Criteria for Aluminum - 1988. EPA 440/5-86-008. Office of Water, Washington, DC.

U.S. Environmental Protection Agency (USEPA). 2001. 2001 Update of Ambient Water Quality Criteria for Cadmium. EPA-822-R-01-001. Office of Water, Washington, DC.