

adopt approaches that differ from EPA's guidance on a case-by-case basis.

III. How Did EPA Involve the Public in the Criteria Update Process?

EPA solicited the public for data and information that would be useful in updating its copper criteria in the 1999 **Federal Register** notice titled, *Notice of Intent To Revise Aquatic Life Criteria for Copper, Silver, Lead, Cadmium, Iron and Selenium; Notice of Intent To Develop Aquatic Life Criteria for Atrazine, Diazinon, Nonylphenol, Methyl Tertiary-Butyl Ether (MtBE), Manganese and Saltwater Dissolved Oxygen (Cape Cod to Cape Hatteras); Notice of Data Availability; Request for Data and Information* (64 FR 58409, October 29, 1999). In this notice, EPA also notified the public that it was assessing the use of the biotic ligand model for updating its copper criteria.

IV. What's New About the Updated Criteria?

The draft aquatic life criteria document, titled *2003 Draft Update of Ambient Water Quality Criteria for Copper* (EPA-822-R-03-026), contains updated freshwater and saltwater aquatic life criteria for copper. These criteria revisions are based in part on new data that have become available since EPA's last comprehensive criteria updates for copper: (*Ambient Water Quality Criteria for Copper—1985* (EPA 440/5-84-031) and *Ambient Water Quality Criteria Saltwater Copper Addendum* (April 14, 1995)). We derived both the freshwater and saltwater criteria recommendations presented in this draft document based on the principles set forth in EPA's *1985 Guidelines for Deriving Numerical National Aquatic Life Criteria for Protection of Aquatic Organisms and Their Uses*. In addition to incorporating new data, the freshwater criterion maximum concentration (CMC or "acute criterion") also uses the biotic ligand model (BLM) in the criteria derivation procedures. The freshwater criterion continuous concentration (CCC or "chronic criterion") is based on a BLM-derived acute value divided by a final acute-chronic ratio.

V. How Do BLM-Derived Criteria Differ From Hardness-Dependent Criteria?

The biotic ligand model is a metal bioavailability model based on the latest information about chemical and physiological effects of metals in aquatic environments. Earlier freshwater aquatic life criteria for copper published by the Agency were based on empirical relationships of toxicity to water hardness. That is, a relationship was

established linking the criteria concentrations with water hardness. These hardness-dependent criteria, however, represented combined effects of different water quality variables (such as pH and alkalinity) correlated with hardness. Unlike the empirically derived hardness-dependent criteria, the BLM explicitly accounts for individual water quality variables and addresses variables that were not factored into the hardness relationship. Where the previous freshwater aquatic life criteria were hardness-dependent, these updated criteria are dependent on a number of water quality parameters (e.g., calcium, magnesium, dissolved organic carbon) described in the document.

You can find more detailed information on the development and application of the biotic ligand model in the criteria document as well as in *Draft Biotic Ligand Model: Technical Support Document for Its Application to the Evaluation of Water Quality Criteria for Copper* (EPA 822-R-03-027) and *Integrated Approach to Assessing the Bioavailability and Toxicity of Metals in Surface Waters and Sediments* (EPA-822-E-99-001).

VI. What Are the Updated Criteria?

The procedures described in the *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses* indicate that, except where a locally important species is very sensitive, freshwater aquatic organisms and their uses should not be affected unacceptably if:

- The 4-day average concentration of dissolved copper does not exceed the BLM-derived site-water LC50 (*i.e.*, Final Acute Value (FAV)) divided by the final acute-chronic ratio more than once every 3 years on the average (*i.e.*, the CCC) and if:

- The 24-hour average dissolved copper concentration does not exceed the BLM-derived site-LC50 (or FAV) divided by two, more than once every 3 years on the average (*i.e.*, the CMC).

The procedures described in the *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses* indicate that, except where a locally important species is very sensitive, saltwater aquatic organisms and their uses should not be affected unacceptably if:

- The 4-day average concentration of dissolved copper does not exceed 1.9 ug/L more than once every 3 years on the average (*i.e.*, the CCC) and if:
- The 24-hour average dissolved copper concentration does not exceed

3.1 ug/L more than once every 3 years on the average (*i.e.*, the CMC).

VII. What Specific Questions of Science Does EPA Want Views on?

Though the public is welcome to submit scientific views on any component of the copper aquatic life criteria document, EPA is specifically interested in scientific views on the following issues of science:

- The freshwater criteria presented in this document were developed utilizing the biotic ligand model (BLM). Are the procedures used to incorporate the model apt? Is the establishment of the chronic criterion through the BLM-calculated FAV and the assigned acute-chronic-ratio (ACR) appropriate?

- Measurements were not available for all input parameters, for all studies used to derive the criteria. In some cases therefore, input parameters were estimated. A detailed description of the methods used to estimate these missing parameters is included in the updated draft copper criteria document's Appendix, *Estimation of Water Chemistry Parameters for Acute Copper Toxicity Tests*. Are the estimation procedures for the parameters appropriate or could other methods be used to improve the estimations?

- To calculate the saltwater final chronic value (FCV) the *Mytilus spp.* species mean acute value (SMAV) was divided by a final acute-chronic ratio (FACR) derived from both freshwater and saltwater species, implying that a "5th percentile" ACR was applicable for use in conjunction with the *M. spp.*-FAV. Submit scientific views on the appropriateness of this calculation procedure.

VIII. What Is the Relationship Between the Water Quality Criteria and Your State or Tribal Water Quality Standards?

Section 303(c)(1) requires States and authorized Tribes to review and modify, if appropriate, their water quality standards at least once every three years. Water quality standards consist of designated uses, water quality criteria to protect those uses, a policy for antidegradation, and general policies for application and implementation.

States and authorized Tribes must adopt water quality criteria that protect designated uses. Protective criteria, based on a sound scientific rationale, contain appropriate factors to protect the designated uses. Criteria may be either narrative or numeric. States and authorized Tribes have four options when adopting water quality criteria for which EPA has published section 304(a) criteria. They can: