

Aluminum/Aquatic Life Ambient Water Quality Criteria: U.S. Environmental Protection Agency Publishes Update



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The United States Environmental Protection Agency ("EPA") on December 21st published a final updated Aquatic Life Ambient Water Quality Criteria ("WQC") recommendations for aluminum in freshwater under Section 304(a)(1) of the Clean Water Act.

EPA states that it is updating its recommended aluminum criteria to reflect the latest science and provide user flexibility to develop criteria based on site-specific water chemistry.

WQC are ambient water quality conditions deemed protective of the uses established for a waterbody. In other words, criteria of the technical judgments as to the specific pollution levels that are compatible with those uses. States are required to adopt WQC protective of the designated uses.

The WQC must specify the maximum concentration of pollutants that may be present in the water without impairing its suitability for certain uses. For example, the state could require the specific waterbody have a chloride concentration of no more than 250 milligrams per liter of water if its use designation is a fishing area.

WQC generally assume three forms which include:

1. Numerical terms reflecting maximum concentration of a particular pollutant in the receiving water
2. Bioassay or biomonitoring results which reflect mortality rates of certain waterborne organisms relative to the concentrations of particular pollutants
3. Terms narrative in nature

The scientific underpinning or rationale for a particular WQC is obviously important. The WQC represent a judgment as to what levels, concentrations, or conditions can support a desired use.

WQC developed by EPA under Section 304(d) of the Clean Water Act are based solely on the relationship between pollutant concentrations and environmental and human effects. Further, they are frequently used by the states in establishing or revising their water quality standards. However, since they are not rules or regulations, states are free to adopt or develop their own WQC. Once a state adopts WQC, they must be reviewed and approved by EPA.

EPA describes in its December 21st update certain characteristics of aluminum such as the fact it is found in most soils and rocks and is the third most abundant element in the earth's crust. It further notes that

elevated levels of aluminum can affect some species' respiratory functions. Aquatic plants are stated to be generally less sensitive than fish and other aquatic life to aluminum.

EPA notes in part that:

. . . the recommended criteria concentrations for aluminum in freshwater to protect aquatic life depends on a site's water chemistry processes.

Further, the bioavailability of aluminum is dependent upon specific water chemistry parameters (i.e., the more bioavailable the aluminum is, the more likely it is to cause a toxic effect).

The updated 2018 Recommended National Aluminum Criteria are expressed as total recoverable metal concentrations. Further, the updated criteria use Multiple Linear Regression models to normalize the toxicity data and provide a range of acceptable values. These criteria are stated to be calculated based on a site's pH, total hardness, and DOC.

The December update provides a chart comparing the 2018 and original values specified in the 1988 aluminum criteria document.

A copy of EPA's update including the preamble can be found [here](#).