

Recommended Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories for Microcystins and Cylindrospermopsin

Summary

EPA has released national recommendations for the *Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories (AWQC/SA) for Microcystins and Cylindrospermopsin*. These recommended AWQC/SA accurately reflect the latest scientific knowledge on the potential human health effects from recreational exposure to these two cyanotoxins. Primary contact recreation is protected in water bodies at or below the recommended concentrations of microcystins and cylindrospermopsin.

These recommendations are intended as guidance to states, territories and authorized tribes to consider when developing water quality standards. Alternatively, these recommendations can be used as the basis of swimming advisories for notification purposes in recreational waters to protect the public. States, territories and authorized tribes may also wish to consider using these recommendations as both water quality criteria and swimming advisory values.

Background

Cyanobacteria, commonly called blue-green algae, are naturally-occurring photosynthetic bacteria found in freshwater and marine ecosystems. Under certain environmental conditions, such as elevated levels of nutrients, warmer temperatures, still water, and plentiful sunlight, cyanobacteria can rapidly multiply to form harmful algal blooms (HABs). HABs have been reported in ambient waters in all states. As the cyanobacteria multiply, some of the cells can produce toxic compounds, known as cyanotoxins, which can be harmful to human and animal health. Microcystins and cylindrospermopsin are two types of toxins produced by cyanobacteria.

During a HAB, the toxin concentration can rapidly increase and may become elevated before a visible bloom is observed. Elevated cyanotoxin concentrations in surface waters can persist after the bloom fades, so human exposures can occur even after the visible signs of a bloom are gone or have moved downstream. Exposure to elevated-levels of microcystins can potentially lead to liver damage; the kidneys and liver appear to be the primary target organs for cylindrospermopsin toxicity.

What are EPA's recommendations?

The recommended AWQC/SA for microcystins and cylindrospermopsin consist of three components—magnitude, duration and frequency—that are considered protective of human health in recreational waters. In developing these recommendations, EPA incorporated the existing peer-reviewed and published science on the adverse human health effects of these toxins, recreation-specific exposure parameters from the peer-reviewed scientific literature and EPA's Exposure Factors Handbook using established criteria methodologies. EPA derived these recommended values based on children's recreational exposures because children can be more highly exposed compared to other age groups. The recommendations are also protective of older age groups.

Water quality criteria recommendations are intended as guidance in establishing new or revised water quality standards. They are not regulations themselves. States and authorized tribes have the discretion to adopt other scientifically-defensible water quality criteria that differ from these recommendations. For use as swimming advisories, EPA envisions states and authorized tribes applying these recommendations in a similar manner as is currently done in their recreational water advisory programs.

The recommended magnitude for both toxins is shown in the following table:

Table. Recommended magnitude for cyanotoxins.

Microcystins	Cylindrospermopsin
8 µg/L	15 µg/L

Duration and Frequency:

For both cyanotoxins, the recommended duration and frequency depend on their application as a water quality criterion or a swimming advisory.

For application as a **recreational water quality criterion**, EPA recognizes that a single exceedance of the recommended magnitude does not necessarily indicate that the designated use is not attained. The recommended frequency and duration support the identification of a trend or pattern of elevated cyanotoxins that can be used to inform the evaluation of a waterbody. EPA recommends states use 10-day assessment periods, not a rolling 10-day period, over the course of a recreation season to evaluate ambient water body condition and recreational use attainment. The 10-day period links the water body assessment period to the adverse health effects observed from ingestion of the toxins over short-term exposures. If toxin concentrations are higher than the criterion magnitude during a 10-day assessment period, then that event should be considered an excursion from the recreational criteria. EPA recommends that when more than three excursions occur within a recreational season and that pattern reoccurs in more than one year, it is an indication the water quality has been or is becoming degraded and a water body may not be supporting the recreational use. EPA expects states and authorized tribes to indicate the number of years the pattern of degradation can occur and not impair the recreational use.

As a basis for issuing a **swimming advisory**, EPA recommends the magnitude not be exceeded on any single day. This is consistent with the goal of a swimming advisory to provide prompt information to people who wish to use the water body for recreation. EPA also recommends that any exceedance of the recommended magnitude result

in a swimming advisory being issued until the toxin concentration falls below the recommended magnitude.

Communicating risk to the public

In 2017, EPA released an [online communications toolbox](#) to support states, tribes, territories, and local governments in developing, as they deem appropriate, their own risk communication materials about cyanobacterial blooms. It includes editable press release templates, social media posts and other quick references.

EPA has also released infographics that states and communities can use to communicate basic information about HABs to the public. The infographics highlight how a HAB might affect both people and animals, and provide helpful information concerning how to identify and respond to a potential bloom. Two downloadable and printable versions of the infographic are available on the [EPA's Cyanobacterial HABs website](#); one as a more detailed poster for display and another as an abbreviated handout. State, tribal and local governments may also customize the infographics by adding local information such as a logo, website address, email address and/or telephone number.

Where can I find more information?

EPA has published the recommended AWQC/SA document, support documents and the Federal Register Notice online in the public docket (Docket ID No. EPA-HQ-OW-2016-0715), which can be accessed via the Agency's [Recreational Water Quality Criteria website](#).

You can also contact [John Ravenscroft](#) (202) 566-1101 or [Lesley D'Anglada](#) (202) 566-1125 for more information.