

Human Health Ambient Water Quality Criteria: Draft 2014 Update

Summary

EPA is announcing in the Federal Register the availability of draft updated ambient water quality criteria for the protection of human health for the purpose of obtaining public comments. EPA has updated its national recommended water quality criteria for human health for 94 chemical pollutants to reflect the latest scientific information and EPA policies. EPA will accept written scientific views from the public on the draft updated human health criteria for 60 days. Once finalized, EPA water quality criteria provide recommendations to states and tribes authorized to establish water quality standards under the Clean Water Act.

Background

Ambient water quality criteria developed by EPA under the Clean Water Act represent specific levels of chemicals or conditions in a water body that are not expected to cause adverse effects to human health. EPA is required to develop and publish water quality criteria that reflect the latest scientific knowledge. These criteria are not rules, nor do they automatically become part of a state's water quality standards. States may adopt the criteria that EPA publishes, modify EPA's criteria to reflect site-specific conditions, or adopt different criteria based on other scientifically-defensible methods. EPA must, however, approve any new water quality standards adopted by a state before they can be used for Clean Water Act purposes.

In this 2014 update, EPA has revised 94 of the existing human health criteria to reflect the latest scientific information, including updated exposure factors (body weight, drinking water intake, fish consumption rate), bioaccumulation factors, and toxicity factors (reference dose, cancer slope factor). The criteria have also been updated to follow the current EPA methodology for deriving human health criteria (2000). Specific updates are described in detail below.

Due to outstanding technical issues, including new toxicity factors and bioaccumulation factors, EPA is *not* updating criteria for the following chemical pollutants at this time: antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium (III or VI), copper, manganese, methylmercury, nickel, nitrates, nitrosamines, N-nitrosodibutylamine, N-nitrosodiethylamine, N-nitrosopyrrolidine, N-nitrosodimethylamine, N-nitrosodi-n-propylamine, N-nitrosodiphenylamine, polychlorinated biphenyls (PCBs), selenium, thallium, zinc, or 2,3,7,8-TCDD (dioxin).

Updated Exposure Assumptions

Body Weight

EPA has updated the default body weight assumption for human health criteria to 80 kilograms based on National Health and Nutrition Examination Survey (NHANES) data from 1999 to 2006. This represents the mean body weight for adults ages 21 and older. EPA's previously recommended body weight assumption was 70 kilograms, which was based on the mean body weight of adults from the NHANES III database (1988-1994).

Drinking Water

EPA has updated the default drinking water intake rate assumption to 3 liters per day based on NHANES data from 2003 to 2006 for all sources of water at the 90th percentile for adults ages 21 and older. This value is based on consumer-only estimates of direct and indirect water ingestion. EPA previously recommended a default drinking water intake rate of 2 liters per day, which represented the 86th percentile for adults surveyed in the US Department of Agriculture's 1994-1996 Continuing Survey of Food Intake by Individuals (CSFII) analysis and the 88th percentile of adults in the National Cancer Institute study of the 1977-1978 Nationwide Food Consumption Survey.

Fish Consumption

EPA has updated the default fish consumption rate to 22 grams per day. This rate represents the 90th percentile consumption rate of freshwater and estuarine fish for the U.S. adult population 21 years of age and older, based on NHANES data from 2003 to 2010 (USEPA 2014). EPA's previously recommend rate of 17.5 grams per day was based on the 90th percentile consumption rate of freshwater and estuarine fish for the U.S. adult population and was derived from 1994-1996 CSFII data.

As described in EPA's human health criteria methodology (USEPA 2000), the level of fish intake in highly exposed populations varies by geographical location. Therefore, EPA suggests a four preference hierarchy for states and authorized tribes that encourages use of the best local, state, or regional data available to derive fish consumption rates. EPA recommends that states and authorized tribes consider developing criteria to protect highly exposed population groups and use local or regional data over the default values as more representative of their target population group(s). The four preference hierarchy is: (1) use of local data; (2) use of data reflecting similar geography/ population groups; (3) use of data from national surveys; and (4) use of EPA's default intake rates.

Bioaccumulation Factors

EPA's national recommended water quality criteria for the protection of human health have been updated using bioaccumulation factors rather than bioconcentration factors, as recommended in EPA's human health criteria methodology (USEPA 2000). Unlike bioconcentration factors, bioaccumulation factors account for more exposure pathways than direct water contact. As a result, the updated criteria will better represent exposures to pollutants that affect human health. In order to account for the variation in bioaccumulation that is due to trophic position of the organism, EPA's human health criteria methodology (USEPA 2000) recommends that bioaccumulation factors be determined and applied to three trophic levels of fish. EPA used a peer-reviewed model called Estimation Program Interface Suite (EPI Suite)

to develop bioaccumulation factors for each trophic level of fish.

Updated Health Risk Factors

EPA has updated the health risk factors using the most current toxicity information. EPA's Integrated Risk Information System (IRIS) is the primary recommended source for reference dose and cancer slope factor information. For some pollutants, more recent assessments may be found using other resources provided by EPA's Office of Water, EPA's Office of Pesticide Programs, and international or state agencies.

Relative Source Contribution

EPA has updated the human health criteria to reflect the recommended default relative source contribution (RSC) of 20 percent, as recommended in EPA's human health criteria methodology (USEPA 2000). The RSC component of the human health criteria calculation for non-carcinogens designates a percentage of the reference dose that accounts for exposures from water and fish (freshwater and estuarine), when there are other possible exposure routes. Other such routes include, but are not limited to, exposure to a particular pollutant from marine fish consumption, non-fish food consumption, dermal exposure, and respiratory exposure. For pollutants exhibiting threshold effects, the use of an RSC ensures that an individual's total exposure from all sources of a pollutant does not exceed that threshold level.

In accordance with EPA's human health criteria methodology (USEPA 2000), an alternative RSC may be used to derive human health criteria when there are sufficient data available to support a scientifically defensible alternative value.

For More Information

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References

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