



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I
FIVE POST OFFICE SQUARE – SUITE 100
BOSTON, MASSACHUSETTS 02109-3912**

April 22, 2020

Susanne Meidel, Water Quality Standards Coordinator
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

Dear Ms. Meidel:

The purpose of this letter is for the Environmental Protection Agency (EPA) to offer recommendations for revisions to be considered during the Maine Department of Environmental Protection (ME DEP) 2020 triennial review of its water quality standards, in accordance with Clean Water Act (CWA) Section 303(c)(1) and 40 CFR §131.20. The EPA's water quality standards regulations at 40 CFR §131.11(a) require states to adopt water quality criteria that protect the designated uses. Such criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated uses. For waters with multiple use designations, the criteria shall support the most sensitive use.

In 2015, the EPA updated the federal water quality standards regulations at 40 CFR Part 131. The EPA has also published revised guidance for human health and aquatic life water quality criteria that reflects new science and/or data. States and authorized tribes have the discretion to adopt the EPA's recommendations, the EPA's recommendations modified to reflect site-specific conditions, or standards based upon other scientifically defensible methods. The EPA is providing the following recommendations for ME DEP's consideration during its 2020 triennial review in light of the updated federal regulations and revised criteria guidance.

2015 Federal Water Quality Standards Regulation Revisions

Justification Documentation

40 CFR § 131.20(a) was amended as part of the EPA's 2015 water quality standards (WQS) regulation revision. The amended regulation requires any state that chooses not to adopt new or revised criteria for any parameters for which the EPA has published new or updated criteria recommendations under CWA § 304(a) to explain its decision when reporting the results of its triennial review to the EPA. The goal of this revised provision is to ensure public transparency about state WQS decisions. The EPA is including this

item as a reminder to include this information, if applicable, in any triennial review submittal to the EPA.

Designated Uses, Variances, and Antidegradation

The EPA made a number of changes to its regulations related to designated uses, variances, and antidegradation. We recommend that ME DEP evaluate the need for changes to state water quality standards based on the recent updates to the federal regulation. The EPA supports ME DEP's intention to propose language to ensure consistency with the federal variance regulations pertaining to highest attainable use.

If ME DEP identifies the need for changes to its own regulations as a result of review of 40 CFR Part 131, the EPA would be happy to work with ME DEP to ensure consistency with the 2015 WQS regulation revisions.

Criteria for Microcystins and Cylindrospermopsin

EPA recommends that DEP consider the adoption of EPA's May 2019 CWA Section 304(a) nationally recommended criteria for microcystins and cylindrospermopsin (EPA 822-R-19-001). Alternatively, these same values can be used as the basis of issuing swimming advisories in recreational waters. The recommended values for microcystins and cylindrospermopsin consist of three components—magnitude, duration and frequency. In developing these recommendations, EPA incorporated peer-reviewed and published science on the adverse human health effects of these toxins, recreation-specific exposure parameters from 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.

Human Health Criteria to Protect the Sustenance Fishing Designated Use Subcategory

In Table I of Ch.584, the EPA recommends that ME DEP add footnote aME to the two arsenic sustenance fishing criteria (water and organisms, and organisms only). It appears that it was DEP's intent to add this footnote in its 2019 revisions.

Aquatic Life Criteria

The EPA recommends that ME DEP consider updating the aquatic life criteria for the following pollutants to reflect the latest science as contained in EPA's latest criteria recommendation documents: Aluminum (Aquatic Life Ambient Water Quality Criteria for Aluminum - 2018, EPA-822-R-18-001); Copper (Aquatic Life Ambient Water Quality Criteria for Copper - 2007, EPA-822-R-07-001); pH (Quality Criteria for Water – 1986, EPA 440/5-86-001); and Selenium (Aquatic Life Ambient Water Quality Criterion for Selenium – Freshwater 2016, EPA 822-R-16-006).

Aluminum

The EPA has updated its national recommended aquatic life water quality criteria for aluminum in order to reflect the latest scientific information. The 2018 updated criteria uses a multiple linear regression (MLR) technique to model the interactive effects of three water quality parameters: pH, hardness, and dissolved organic carbon (DOC). The MLR models are used to normalize the available toxicity data to accurately reflect the effects of the water chemistry on the toxicity of aluminum to tested species. To obtain numeric criteria values for a specific set of water-chemistry conditions, users can input site-specific data for pH, total hardness and DOC into the Aluminum Criteria Calculator or use lookup tables that provide the same information for those conditions. The calculator outputs (CMC and CCC) would protect aquatic life under the full range of ambient conditions found at each site, including conditions when aluminum is most toxic given the spatial and temporal variability of the water chemistry at the site. The EPA encourages ME DEP to adopt the 2018 updated criteria and to replace the Water Effect Ratio (WER) with the MLR when developing site specific criteria to reflect the latest science. EPA looks forward to supporting DEP to collect pH, hardness and DOC data from waters across the state to identify appropriate MLR input parameters. Furthermore, EPA encourages DEP to coordinate with the Region concerning implementation of updated aluminum criteria and potential effects to Federal endangered or threatened species.

If Maine adopts the updated nationally recommended aluminum criteria, it would not be appropriate for DEP to apply WERs (either existing or developed in the future) to those criteria, since the MLR criteria inherently take into account site-specific conditions. EPA recommends that Maine delete any existing aluminum WERs when it adopts the MLR criteria so there is no confusion.

Ammonia

EPA commends DEP for updating its freshwater ammonia criteria to protect aquatic life in accordance with the latest science in EPA's current nationally recommended criteria. EPA recommends that DEP delete from Table 2 of Ch. 584 the reference to EPA822-R-99-014, as this document has been superseded by EPA822-R-13-001.

Copper

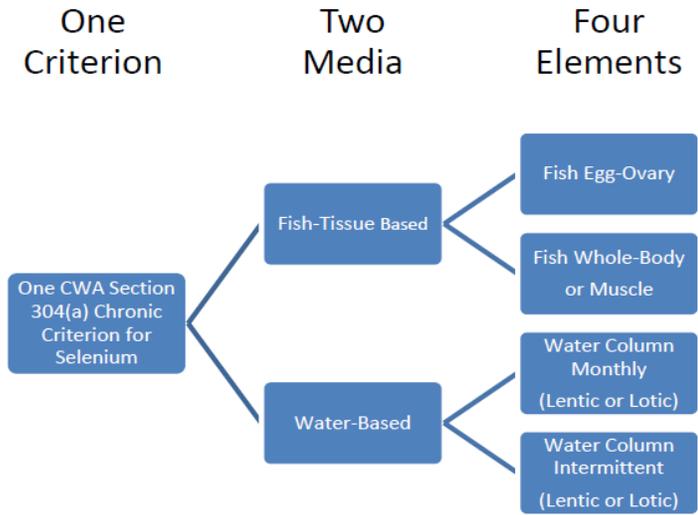
The bioavailability of copper in real world conditions is affected by many variables. The EPA developed and issued the 2007 revised recommended copper criteria using the biotic ligand model (BLM) to account for the effects of these variables when calculating copper criteria in fresh waters. The BLM reflects the best available science on copper bioavailability and toxicity with which to develop protective copper criteria. The BLM explicitly and quantitatively accounts for the effect of individual water quality parameters that modify metal toxicity in fresh waters. Specifically, the BLM addresses the influence of both biotic and abiotic (organic and inorganic) ligands in the calculation of the bioavailability of metals to aquatic organisms over a broad range of conditions. The BLM can be applied cost-effectively and easily across spatial and temporal scales. EPA's 2007 BLM Criteria Document also incorporated the latest scientific information, including updated toxicity information for six sensitive species (*Ceriodaphnia dubia*, *Lithoglyphus*

virens, *Scaphocheberis sp.*, *Actinonaias pectorosa*, *Hyalella azteca*, and *Juga plicifera*), which include a freshwater mussel. The EPA recommends that ME DEP consider adopting EPA’s current national recommended water quality criteria for copper. EPA also recommends that DEP clarify in Ch. 584 that WERs do not apply to BLM results. The BLM inherently takes into account site-specific conditions.

Selenium

EPA published an updated freshwater aquatic life criterion for selenium in 2016, which consists of several components to protect aquatic life from chronic effects. Aquatic communities are expected to be protected by this chronic criterion from any potential acute effects of selenium, so there is no acute criterion as part of the 2016 CWA section 304(a) recommendation.

The chronic criterion includes values expressed both in terms of fish tissue concentration (egg/ovary, whole body, muscle) and water concentration (lentic, lotic), as shown in the following figure:



EPA recommends that DEP consider the adoption of the comprehensive 2016 selenium criterion which is presented in the table below:

Table 1. Summary of the Recommended Freshwater Selenium Ambient Chronic Water Quality Criterion for Protection of Aquatic Life.

Media Type	Fish Tissue ¹		Water Column ⁴	
Criterion Element	Egg/Ovary ²	Fish Whole Body or Muscle ³	Monthly Average Exposure	Intermittent Exposure ⁵
Magnitude	15.1 mg/kg dw	8.5 mg/kg dw whole body or 11.3 mg/kg dw muscle (skinless, boneless filet)	1.5 µg/L in lentic aquatic systems 3.1 µg/L in lotic aquatic systems	$WQC_{int} = \frac{WQC_{30-day} - C_{bkgrnd}(1 - f_{int})}{f_{int}}$
Duration	Instantaneous measurement ⁶	Instantaneous measurement ⁶	30 days	Number of days/month with an elevated concentration
Frequency	Not to be exceeded	Not to be exceeded	Not more than once in three years on average	Not more than once in three years on average
<p>1. Fish tissue elements are expressed as steady-state. 2. Egg/Ovary supersedes any whole-body, muscle, or water column element when fish egg/ovary concentrations are measured. 3. Fish whole-body or muscle tissue supersedes water column element when both fish tissue and water concentrations are measured. 4. Water column values are based on dissolved total selenium in water and are derived from fish tissue values via bioaccumulation modeling. Water column values are the applicable criterion element in the absence of steady-state condition fish tissue data. 5. Where WQC30-day is the water column monthly element, for either a lentic or lotic waters; C_{bkgrnd} is the average background selenium concentration, and f_{int} is the fraction of any 30-day period during which elevated selenium concentrations occur, with f_{int} assigned a value ≥ 0.033 (corresponding to 1 day). 6. Fish tissue data provide instantaneous point measurements that reflect integrative accumulation of selenium over time and space in fish population(s) at a given site.</p>				

Ambient water physical characteristics

The EPA recommends that ME DEP delete section 5.B. of Ch. 584, which establishes required ambient water physical characteristics for fresh, marine and estuarine waters for calculating water quality criteria that are dependent on hardness, temperature, pH, and salinity. EPA recommends using actual hardness, temperature, pH and salinity for water quality criterion calculations.

Freshwater aquatic life criteria for certain metals are expressed as a function of hardness because hardness and/or water quality characteristics that are usually correlated with hardness can reduce or increase the toxicity of some metals. For example, decreasing hardness has the effect of increasing the toxicity of metals to aquatic life. This effect is important to consider in Maine, where it is not unusual for surface waters to have hardness values near and below a hardness of 20 mg/L. By capping hardness at 20 mg/L, any waters with lower ambient hardness values will have more dissolved metals available, and therefore criteria calculated based on a hardness of 20 mg/L in waters with lower hardness than 20 mg/L may not be protective of aquatic life, including Federally listed threatened and endangered species.

In its 2002 update to the national recommended water quality criteria, EPA clarified that although in the past, EPA generally recommended that 25 mg/L as CaCO₃ be used as a default hardness value in deriving freshwater aquatic life criteria for metals when the ambient (or actual) hardness value is below 25 mg/L as CaCO₃, use of the approach results in criteria that may not be fully protective. Therefore, for waters with a hardness of less than 25 mg/L as CaCO₃, criteria should be calculated using the actual ambient hardness of the surface water.

If Maine is concerned that using ambient hardness in waters where hardness is below 20 mg/L may be overly protective, please provide additional data or justification demonstrating that designated uses would be protected if standards are calculated based upon 20 mg/L hardness in waters with a hardness less than 20 mg/L.

Recommendations Consistent with Certain EPA WQS Disapprovals in 2015 and Corresponding Federal Rules

In 2015, EPA issued several decisions in which the Agency disapproved a number of Maine's WQS. (see EPA letters to ME DEP dated February 2, March 16, and June 5, 2015) Most of the disapprovals related only to waters in Indian lands, but several related to all waters in Maine. EPA then promulgated federal rules in place of most of the disapproved WQS. (see 81 FR 92466) Consistent with 40 CFR § 131.21(c), EPA's federally promulgated WQS are and will be applicable for purposes of the CWA until EPA withdraws those federally promulgated WQS. EPA would undertake a rulemaking to withdraw the federal WQS if and when Maine adopts, and EPA approves, corresponding WQS that meet the requirements of section 303(c) of the CWA and EPA's implementing regulations at 40 CFR part 131. Below are EPA's recommendations for revisions to Maine's WQS that could lead to EPA's approval of state standards and subsequent withdrawal of federal standards. In each instance, we suggest that DEP refer to the currently applicable federal rule as an example of an approvable state replacement rule or statute.¹

pH

EPA recommends that ME DEP update the freshwater aquatic life criteria for pH. EPA's nationally recommended pH criterion is 6.5 to 9.0. Maine's 38 M.R.S. §§ 464 and 465 state that the discharge of pollutants to any water of the State is violated if the pH falls outside of 6.0 to 8.5 for fresh waters. As discussed in EPA's Quality Criteria for Water (1986), pH values of 6.0 and lower have been shown to be detrimental to sensitive aquatic life, such as developing Atlantic salmon eggs and smolts. EPA recommends that Maine revise the lower bound of its pH criterion range from 6.0 to 6.5 for fresh waters state-wide.

¹ EPA disapproved the reclassification of a 0.3 mile segment of Long Creek that flows through Westbrook from Class B to Class C in its March 16, 2015 letter to DEP. EPA requests that DEP clarify that this segment remains Class B.

Temperature for Tidal Waters

EPA recommends that DEP update Maine's tidal temperature criteria in DEP Rule Ch. 582(5), consistent with EPA's 304(a) recommended criteria for tidal waters. (Quality Criteria for Water 1986, U.S. Environmental Protection Agency, Office of Water, Washington, DC. EPA 440/5-86-001. Temperature section.)

Natural Conditions

Maine 38 M.R.S. 420(2.A), states "Except as naturally occurs or as provided in paragraphs B and C, the board shall regulate toxic substances in the surface waters of the State at the levels set forth in federal water quality criteria as established by the United States Environmental Protection Agency pursuant to the Federal Water Pollution Control Act, Public Law 92-500, Section 304(a), as amended"; and 38 M.R.S. 464(4.C) states: "Where natural conditions, including, but not limited to, marshes, bogs and abnormal concentrations of wildlife cause the dissolved oxygen or other water quality criteria to fall below the minimum standards specified in sections 465, 465-A and 465-B, those waters shall not be considered to be failing to attain their classification because of those natural conditions."

These provisions are not consistent with EPA's interpretation of the relationship between natural conditions and the protection of designated human health uses, which is articulated in EPA's November 1997 guidance entitled *Establishing Site Specific Aquatic Life Criteria Equal to Natural Background*. The natural conditions clauses at 38 M.R.S. 464(4.C) and 420(2.A) for waters in Maine are not appropriate as they apply to criteria that protect human health because the application of these provisions fails to protect designated human health uses as required by the CWA and federal WQS regulations at 40 CFR 131.11(a). As articulated in EPA's November 1997 guidance *Establishing Site Specific Aquatic Life Criteria Equal to Natural Background*, in contrast with aquatic life uses, a natural level of a naturally occurring pollutant does not necessarily protect designated human uses. Naturally occurring levels of a pollutant are assumed to protect aquatic species that have adapted over evolutionary timescales to conditions in the affected waters. However, human health does not adapt to higher ambient pollutant levels, even if they are naturally caused. Consequently, the same assumptions of protectiveness cannot be made with regard to designated uses that affect human health (e.g., people eating fish or shellfish from Maine waters, and recreating in Maine waters).

EPA recommends that 38 M.R.S. 420(2.A) and 38 M.R.S. 464(4.C) be modified, or clarified, to state that this provision "does not apply to water quality criteria intended to protect human health." Under this approach, Maine still could implement the natural conditions provisions for other criteria related to non-human health uses. If there are naturally occurring pollutants which exceed Maine's criteria to protect human health, Maine may revise its WQS on a site-specific basis to remove or modify a use, in accordance with the procedures of 40 C.F.R. § 131.10(g) and 38 M.R.S. § 464(2-A).

Waiver or Modification of Water Quality Standards

Maine 38 M.R.S. § 363-D provides that the DEP Commissioner (or designee) may waive or modify any provision of Maine's Title 38, Ch. 3 (related to the protection and improvement of waters), which includes WQS, to assist in any oil spill response activity

conducted in accordance with the national or state contingency plans, or as otherwise directed by the federal on-scene coordinator or the Commissioner (or designee).

In its June 5, 2015 letter to DEP, EPA disapproved this provision for all waters in Maine because under EPA regulations, waivers or modifications of WQS that would have the effect of removing a designated use or creating a subcategory of use, including waiving or modifying criteria necessary to support the use, may occur under the CWA only in accordance with 40 CFR §131.10(g) (which, among other things, requires a use attainability analysis and public participation).

EPA's final federal rule clarifies that this provision does not apply to WQS. Therefore, Maine's provision is not applicable to WQS.

EPA requests that 38 M.R.S. § 363–D be modified to explicitly state that it does not apply to state or federal WQS applicable to waters in Maine, including designated uses, criteria to protect designated uses, and antidegradation requirements.

EPA's regulations at 40 CFR § 122.3(d) provide a limited exception from the need to get an NPDES permit, and indirectly, to comply with WQS, for “any discharge in compliance with the instructions of an On-Scene Coordinator pursuant to 40 CFR part 300 (The National Oil and Hazardous Substances Pollution Contingency Plan) or 33 CFR § 153.10(e) (Pollution by Oil and Hazardous Substances).” Maine has a similar permitting provision at 38 M.R.S. § 413(2–G.B) that it can rely on in such circumstances.

Mixing Zone Policy (38 M.R.S. § 451)

EPA recommends that DEP update its current mixing zone policy to include explicit restrictions on the scope and extent of mixing zones adequate to protect designated uses. EPA's guidance in its *Water Quality Standards Handbook*² explains that a mixing zone is a limited area or volume of water where initial dilution of a discharge takes place, and where certain numeric criteria may be exceeded, so long as the designated uses of the waterbody as a whole are protected. While mixing zones serve to dilute concentrations of pollutants in effluent discharges, they also allow increases in the mass loading of the pollutant to the waterbody (more so than would occur if no mixing zone were allowed). Therefore, if not applied appropriately, a mixing zone could adversely affect mobile species passing through the mixing zone as well as less mobile species (e.g., benthic communities) in the immediate vicinity of the discharge. Because of these and other factors, mixing zones should be applied carefully so that they do not result in impairment of the designated use of the waterbody as a whole or impede progress toward the CWA goals of restoring and maintaining the physical, chemical, and biological integrity of the Nation's waters. EPA's guidance includes specific recommendations that a state's mixing zone policy should include to ensure the protection of designated uses. Among other things, mixing zone policies should ensure that mixing zones do not impair the designated uses of the water body as a whole; that pollutant concentrations in the mixing zone are not lethal to organisms passing through and do not cause significant human health risks; and that mixing zones do not endanger critical areas such as breeding or

² EPA, *Water Quality Standards Handbook – Section 5: General Policies*, Section 5.1, 2020 online version.

spawning grounds, drinking water intakes and sources, shellfish beds, or endangered or threatened species habitat.

Coordination

The EPA looks forward to continued coordination with Maine DEP during standards revisions and is committed to providing any technical expertise requested by the State in the future development and revision of the State's WQS.

Please contact Dan Arsenault at (617) 918-1562 or Bonnie Blalock at (617) 918-1253 if you have any questions.

Sincerely,

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