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Traci Iott
Bureau of Water Protection and Land Reuse
Connecticut Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106

Dear Ms. Iott:

The purpose of this letter is for the Environmental Protection Agency (EPA) to offer recommendations for revisions to be considered during the Connecticut Department of Energy and Environmental Protection (CTDEEP) 2019 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 use. Such criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use. 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 reflect 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 CTDEEP's consideration during its 2019 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, and Variances

The EPA made a number of changes to its regulations related to designated uses, variances, and antidegradation. We recommend that CTDEEP evaluate the changes to these regulations. If CTDEEP identifies the need for changes to its own regulations as a result, the EPA would be happy to work together with CTDEEP to ensure consistency with the 2015 WQS regulation revisions. The EPA supports CTDEEP's intention to propose language to ensure consistency with the federal regulations pertaining to highest attainable use.

Compliance Schedule Authorizing Provision

The EPA has concluded that before a permitting authority can include a compliance schedule for a water quality-based effluent limit (WQBEL) in a National Pollutant Discharge Elimination System (NPDES) permit, the state must affirmatively authorize the use of compliance schedules in its WQS or implementing regulations (40 CFR §131.15). Further, such a compliance schedule may only be allowed where the WQS on which the WQBEL is based is new, newly interpreted, or revised after July 1,1977; and such schedule must also be consistent with 40 CFR §§122.2 and 122.47. The EPA's CWA Section 303(c) approval of the state' s permit compliance schedule authorizing provision as a WQS ensures that any WQBEL within an NPDES permit that contains a compliance schedule is derived from and complies with applicable WQS as required by 40 CFR §122.44(d)(l)(vii)(A). Formal adoption of such an authorizing provision as a legally binding provision ensures public transparency, facilitates public involvement, and is consistent with the intent of the 2015 WQS regulatory revision. If CTDEEP intends to include compliance schedules in NPDES permits to meet WQBELs, the EPA requests that CTDEEP adopt a permit compliance schedule authorizing provision, as a WQS, to ensure compliance with the applicable regulations.

**Human Health Criteria**

Toxics

In June 2015, the EPA issued the *Updated Ambient Water Quality Criteria for the Protection of Human Health* (EPA-HQ-OW-2014-0135). In total, the EPA updated its national recommended 304(a) human health criteria for 94 chemical pollutants. The 2015 recommendations include revised criteria input values for body weight, drinking water intake, fish consumption rate, health toxicity values, bioaccumulation factors, and relative source contribution. The EPA supports CTDEEP's intent to review the updated 2015 human health criteria recommendations.

The EPA also recommends that CTDEEP consider EPA's current nationally recommended methylmercury criterion of 0.3 mg/kg fish tissue residue to protect human health. This water quality criterion, published in 2001, describes the maximum advisable concentration of methylmercury in freshwater and estuarine fish and shellfish tissue to protect consumers of fish and shellfish among the general population. Because consumption of contaminated fish and shellfish is the primary route of human exposure to methylmercury, the EPA expresses this water quality criterion as a fish and shellfish tissue value rather than a water column value. The EPA published implementation

guidance for this criterion in 2010. More information is available on EPA's website at https://www.epa.gov/wqc/human-health-criteria-methylmercury.

Bacteria and Extended Disinfection Period

In December 2012, EPA issued the *2012 Recreational Water Quality Criteria* (EPA-HQ-OW-2011-0466). The 2012 Recreational Water Quality Criteria are designed to protect the public from exposure to harmful levels of pathogens while participating in water-contact activities such as swimming, wading, and surfing in all waters designated for such recreational uses. The EPA supports CTDEEP's intent to review EPA's updated 2012 Recreational Water Quality Criteria.

EPA also supports CTDEEP's proposal to extend the disinfection period for all sewage treatment plants located north of Highway I-95, unless an alternative schedule is approved, in order to protect contact recreational activities that occur outside the current disinfection timeframe of May 1 to October 1. Public information about contact recreational use from October through April will be important for CTDEEP to evaluate as it determines the disinfection timeframe (and applicability of corresponding criteria) necessary to protect existing and designated recreational uses.

**Aquatic Life Criteria**

The EPA recommends that CTDEEP consider the updated national 304(a) recommended aquatic life criteria for the following pollutants: carbaryl (Aquatic Life Ambient Water Quality Criteria for Carbaryl - 2012, EPA-820- R-1 2-007); ammonia (Aquatic Life Ambient Water Quality Criteria for Ammonia - Freshwater 2013, EPA 822-R-1 3-001); selenium (Aquatic Life Ambient Water Quality Criterion for Selenium - Freshwater 2016, EPA 822-R-16-006); cadmium (Aquatic Life Ambient Water Quality Criteria for Cadmium - 2016, EPA-820-R-16-002); copper (Aquatic Life Ambient Water Quality Criteria for Copper - 2007, EPA-822-R-07-001); and aluminum (Aquatic Life Ambient Water Quality Criteria for Aluminum - 2018, EPA-822-R-18-001).

Ammonia

In updating the 1999 national recommended ammonia criteria, the EPA conducted an extensive literature review that incorporates new toxicity data from 69 studies, including new data on freshwater mussels and gill-bearing snails, which are both sensitive to ammonia toxicity. The EPA submitted both its 2009 draft and the 2013 final recommended criteria to external scientific peer review. Because these newly published criteria rely on the latest research and science, the EPA supports CTDEEP's intent to review the updated 2013 Aquatic Life Ambient Water Quality Criteria for Ammonia.

Aluminum

On December 21, 2018, the EPA published the final updated freshwater aquatic life criteria for aluminum in the Federal Register. This document reflects the latest science and allows users to develop criteria reflecting the impacts of local water chemistry on aluminum toxicity to aquatic life. Lookup tables are provided in an appendix of the criteria document to find the criteria concentrations that most closely correspond to local conditions for ambient pH, total hardness, and dissolved organic carbon (DOC).

Alternatively, stakeholders can use the Aluminum Criteria Calculator to calculate freshwater aluminum criteria based on these same water quality parameters. The spreadsheet for the Aluminum Criteria Calculator can be downloaded from the following link:
https://www.epa.gov/wqc/aquatic-life-criteria-aluminum#2018

The EPA encourages CTDEEP to consider updating its aluminum criteria to reflect the latest science.

Cadmium

The EPA has updated its national recommended aquatic life ambient water quality criteria for cadmium in order to reflect the latest scientific information. The 2016 updated criteria account for many new laboratory aquatic toxicity tests published since EPA's 2001 national recommended cadmium criteria document was released. In addition, the effect of total hardness on cadmium toxicity was also revised using the updated data. The updated criteria document underwent an external peer review that was completed in 2015. The EPA encourages CTDEEP to consider updating its cadmium criteria to reflect the latest science.

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 (*Ceriodaplmia dubia*, *Lithoglyphus virens*, *Scaphofeberis sp.*, *Actinonaias pectorosa*, *Hyalella azteca*, and *Juga plicifera*), which include a freshwater mussel. The EPA recommends that CTDEEP consider adopting EPA's current national recommended water quality criteria for copper.

In 1996, Connecticut completed a Copper Water Effects Ratio Study (Connecticut WER Study) which developed site specific freshwater aquatic life copper criteria for a specified list of stream segments. Connecticut's analysis indicated criteria based on the reference site WERs were expected to provide conservative protection of designated aquatic life uses when applied to the waters that contain treated municipal wastewater. EPA approved Connecticut's adoption of the site-specific copper criteria on October 20, 1997. If CTDEEP decides not to update the WER-based site-specific copper criteria to reflect EPA's most recent BLM-based criteria recommendations, then CTDEEP must explain its decision when it submits the results of its triennial review to EPA in accordance with 40 CFR § l31.20(a), as described under the heading "Justification Documentation" above. In

this event, EPA additionally recommends that CTDEEP reevaluate the copper site-specific WER-based criteria as explained below.

More than twenty years have lapsed since the existing copper site-specific criteria were developed in the State of Connecticut WER Study, and data used in this study are likely even older. If CTDEEP does not adopt criteria based on the BLM, EPA recommends that CTDEEP reevaluate the existing site-specific criteria to determine whether they remain protective of the aquatic life designated use or whether they need to be revised to account for any changes in water chemistry. For example, when advanced treatment for nutrient removal is installed at wastewater treatment facilities, it typically reduces the dissolved organic carbon (DOC) available for binding copper, and therefore increases the metal's bioavailability.[1] The State of Connecticut WER study was performed before implementation of phosphorus controls, and therefore does not account for the reduction of DOC associated with phosphorus controls. A periodic reevaluation of site-specific criteria is consistent with EPA's *Interim Guidance on Determination and Use of Water-Effect Ratios for Metals.*[2]

Selenium

In 2016, EPA updated its national recommended chronic aquatic life criterion for selenium in fresh water under section 304(a) of the Clean Water Act. The 2016 criterion reflects the latest scientific knowledge, which indicates that selenium toxicity to aquatic life is primarily based on organisms consuming selenium contaminated food rather than by being exposed only to selenium dissolved in water. The final criterion is expressed both in terms of fish tissue concentration (egg/ovary, whole body, muscle) and water concentration (lentic, lotic). The EPA encourages CTDEEP to consider updating its selenium criteria to reflect the latest science.

**Hydrologic Criteria**

Low Flow Statistic Applicable to Fresh Waters

Critical low flows are used for translating chemical-specific numeric criteria for aquatic life and human health into water quality-based effluent limits to ensure that designated uses will be protected under the majority of flow conditions.

The 7Q10 low flow, which is currently designated in CT WQS as the critical low flow, is the lowest seven consecutive day mean stream flow with a recurrence interval of ten years. . In CT WQS, "7Q10 is the minimum flow to which the Connecticut Water Quality Standards for surface waters apply, except when a surface water is regulated by dams or water withdrawals sanctioned by law to result in flows below that level." CTDEEP is recommending during its triennial review that the critical low flow be changed to Q99, which is the daily average streamflow that is exceeded 99% of the time.

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[1] USEPA 2007. Aquatic Life Ambient Freshwater Quality Criteria – Copper. Office of Water, Washington, D.C. EPA 822-R-07-001.

[2] USEPA. 1994. Interim Guidance on Determination and Use of Water Effect-Ratios for Metals, Office of Water and Office of Science and Technology. EPA-823-B-94-001.

Both EPA's *Technical Support Document For Water Quality-based Toxics Control* (1991) and EPA's *Technical Guidance Manual for Performing Wasteload Allocations Book VI: Design Conditions – Chapter 1: Stream Design Flow for Steady-State Modeling* (1986) recommend use of the 7Q10 as the critical low flow for implementing chronic aquatic life criteria. The EPA recommends use of the harmonic mean flow for implementing human health criteria. States may designate other critical low-flow values to implement the applicable criteria, provided they are scientifically justified as protective of applicable designated uses.

**Downstream Protection**

The EPA supports CTDEEP's intention to provide additional regulatory clarity about how the State protects downstream waters in establishing water quality standards, consistent with 40 CFR §131.10(b).

**Water Quality Classification Maps**

The EPA reminds CTDEEP that federal regulations prohibit removal of existing uses. In addition, removal of a designated use specified in section 101(a)(2) of the Clean Water Act, including shellfishing, must be supported by a use attainability analysis demonstrating that the use cannot be fully attained due to one or more of the six factors at 40 CFR §131.10(g). When a 101(a)(2) designated use is removed, federal regulations also require identification and adoption of the highest attainable use.

**Coordination**

The EPA would like to continue coordination with CTDEEP 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. The EPA also encourages CTDEEP to continue to work with other agencies such as the U. S. Fish and Wildlife Service and National Marine Fisheries Service.

Please contact me at (617) 918-1629 or Jeanne Voorhees at (617) 918-1686 if you have any questions.

Sincerely,

Ralph W. Abele

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