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Attn: Docket ID No. EPA-HQ-OW-2009-0921

Subject: Draft 2009 Update, Aquatic Life Ambient Water Quality Criteria for Ammonia-Freshwater

Thank you for the opportunity to provide comments on the Draft 2009 Update for the Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater dated December 2009 (EPA-822-D-09-001).

The following comments have been prepared by TriTAC, a technical advisory organization of clean water agencies in California comprised of members from the California Association of Sanitation Agencies (CASA), California Water Environment Association (CWEA), and the California League of Cities. Our organization represents agencies that provide wastewater treatment services to most of the sewer population of California. The Draft 2009 Update is of greatest interest to our members, who discharge treated effluent to freshwater and estuarine water bodies in California and will be impacted by the criteria, associated guidance and subsequent NPDES permitting decisions.

Our comments are focused on several key areas, which include:

- a. Use of mussel data in the establishment of water column criteria
- b. Clarification in the application of the proposed criteria
- c. Application of proposed criteria in California
- d. NPDES permit compliance ramifications of proposed criteria

TriTAC Comments

- a. Use of mussel data in the establishment of water column criteria

Mussels can dwell on, in and below sediment surfaces and their route of exposure to water column ammonia differs from that of pelagic organisms. The draft criteria are based on ambient overlying water column pH and temperature conditions that

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may not reflect or be representative of the actual exposure conditions for mussels. For instance, sediment pH is commonly lower than that of ambient waters (which would lessen toxicity). Likewise, near surface temperature data will likely not accurately reflect ambient exposure conditions for mussels. The criteria document should consider these factors and explain the limitations inherent in using sediment-dwelling organisms in the establishment of ambient water column criteria.

b. Clarification in the application of the proposed criteria

The Draft criteria document differentiates between situations where freshwater mussels are present, or not present. It is very important to clarify that the proposed “mussels present” criteria apply more specifically to freshwater mussels of the Family *Unionidae* and not to the presence of mussels in general. In the titles of Tables B and C on page 9 and 31, respectively, and throughout the criteria document, the basis for the difference in proposed criteria values is clearly reflected in the phrase “without freshwater bivalve data from the Family *Unionidae*.” The table headings also reflect this distinction by the wording “Excluding Freshwater Mussel Data (Family *Unionidae*)”. Inspection of the data that govern the proposed chronic criterion for the “mussels present” condition indicates that data from mussel species of other families are not included.

The following language changes are requested to be made in the criteria document to provide necessary clarification:

1. Change the criteria designation to “*Unionid* mussels present” rather than the more generic “mussels present” language throughout the criteria document.
2. Add specific language that clarifies that “the determination of whether *Unionid* mussels are present is to be based on an assessment of best available current information, rather than on a prospective future condition.”
3. Add specific language that directs the collection and assessment of localized benthic community data prior to application of the “*Unionid* mussels present” criteria.
4. Add specific language to clarify and limit the application of the “*Unionid* mussels present” criteria in estuaries. Language should state that “the presence of freshwater mussels in an estuarine environment would only occur in areas where very low salinity conditions exist (e.g., where salinity of a specific magnitude and duration exists within the tolerance range of *Unionid* mussels).” The criteria document should clearly state the salinity tolerance range of *Unionid* mussels.
5. Add language that allows reconsideration of the presence of freshwater mussels through data collection in a specific water body

or segment of a water body that would support a site specific adjustment of the criteria.

c. Application of Proposed Criteria in California

We appreciate the distinction that has been made in the Draft 2009 Update between water bodies with freshwater mussels of the family *Unionidae* present versus water bodies where such freshwater mussels are not present. In California, this distinction is very important given the relative scarcity of *Unionid* mussels in the State.

Only seven native mussel species are present west of Continental Divide [Nedau, E., Smith, A.K. and Stone, J., *Freshwater Mussels of the Pacific Northwest*, undated, available at www.fws.gov/columbiariver/]. This is a very different diversity as compared to the 290 species that occur in the eastern two-thirds of North America. As noted in this reference:

“Low diversity west of the Continental Divide is the result of glaciers, dispersal barriers, climate and geology. The Cordilleran Ice Sheet covered northern parts of the landscape up to 18,000 years ago, destroying aquatic habitats and pushing mussels into southern refugia. The Continental Divide was an insurmountable dispersal barrier for most aquatic animals, keeping the rich diversity of eastern species from colonizing western rivers. The arid climate throughout parts of the west made conditions difficult for mussels to disperse and proliferate. Many stream and rivers were rocky, high gradient environments with tremendous erosive force that inhibited long-lived, fragile and sedentary animals from becoming established.”

Where native species of freshwater mussels on the Pacific Coast have been extirpated, this has been the result of multiple factors, including water diversions, fluctuating levels in reservoirs and non-native fish species introductions. Other contributing factors were habitat loss, pollution, blockage of anadromous fish and introduced species. The factors having the greatest effect on freshwater mussels of the West include water availability, dams, introduced species and the chronic effects of urbanization, agriculture and logging on habitat quality.

The California floater (*Anodonta californiensis*) is federally listed as a species of concern. In many areas of California, natural populations of this species are believed to have been extirpated, particularly in southern California and in areas of the Central Valley. This species thrived in reservoirs, but were adversely impacted by fluctuating water levels.

Mussel species that are currently found in California are typically invasive species including quagga (*Dreissena bugensis*), and potentially zebra mussels (*Dreissena polymorpha*). Also, the Asiatic clam (*Corbicula fluminea*), the third most sensitive taxon used in derivation of the proposed acute criteria, has recently invaded California streams and estuaries. This bivalve species has created adverse impacts on food webs in the Sacramento-San Joaquin Delta estuary and is not an indicator of a desirable or a healthy ecosystem. Practical and legal questions exist whether

either criteria or standards should be established which are geared to protection of invasive species.

TriTAC recommends against using exotic, invasive species as the foundation of any locally applied water quality criteria guidance values. The purpose of USEPA criteria is to provide scientific advice to allow individual states to establish appropriate water quality standards. Blanket application of the “mussels present” criteria will likely result in criteria that are overprotective for California since the native freshwater *Unionid* mussel species listed in the Draft 2009 Update are not present in many California water bodies. Also, a very real question exists whether return of *Unionid* mussel species would result from changes in ambient ammonia concentration due to other overriding factors, as described above, which would prevent successful re-establishment of these species.

Clarification of these issues is important to the establishment of water quality standards and effluent limitations for ammonia that are both appropriate and attainable in different water bodies in California.

d. NPDES permit compliance ramifications of proposed criteria

To address the compliance ramifications of the proposed criteria, recent ammonia data (as NH_3) from a sampling of nine (9) advanced municipal wastewater treatment plants in California have been assembled and analyzed. Most of these plants discharge to effluent dominated water bodies, as is common in the arid west, and all currently nitrify to remove ammonia. Under the state and federal clean water regulatory program in California, these plants are not provided with a dilution credit in the determination of water quality based effluent limits. Therefore, the projected effluent limits that would be derived from the “mussels present” criteria would be projected to be in the following ranges, based on assumptions of a temperature of 25 degrees C and pH of 8.0:

Average monthly effluent limits (AMEL):	0.18 to 0.26 mg/l as N
Maximum daily effluent limits (MDEL):	0.45 to 0.79 mg/l as N

Using projected effluent limits for each facility, the compliance frequency for the existing nine nitrification treatment facilities has been assessed and is included in Attachment A. Probability plots of effluent quality in comparison to projected effluent limits are provided in Attachment B.

The above analysis indicates that five of the nine plants examined would have significant compliance problems with the effluent limits derived from the proposed “mussels present” criteria. In contrast, all of plants examined except one would have no similar problems in attaining compliance with limits derived from the other proposed criteria in the 2009 update.

A separate analysis has been performed for a second group of eight (8) municipal plants in California, with a similar result. In that case, ammonia was detected in 934 of 952 final effluent samples collected from 2005 through 2008 at the eight tertiary

treated wastewater reclamation facilities that incorporate nitrification/denitrification (NDN) treatment. In order to provide adequate disinfection while maintaining drinking water standards for NDMA and THMs, chloramination is used for disinfection at these facilities. When used in conjunction with NDN treatment, chloramination is achieved through the addition of minimal amounts of ammonia to combine with free chlorine. As a result of incorporating chloramination with NDN treatment, mean total ammonia concentrations of the 934 final effluent samples with detected ammonia was 1.2 mg/l with a median value of 1.1 mg/l. In comparing these effluent ammonia concentrations with the AMEL and MDEL limits stated above, it is clear that significant compliance problems would result when trying to meet either the average monthly or daily maximum limits that would be derived from application of the proposed "mussels present" criteria.

For the plants in question, which all discharge to ephemeral receiving waters with no dilution credit, an analysis was performed to estimate the capital costs of attaining effluent limits derived from the proposed "mussels present" criteria. That analysis was based on the conversion of disinfection facilities at each of the eight plants from the chloramination process described above to an ultraviolet light disinfection process. The estimated aggregate cost for this change at the eight plants, which have a combined average dry weather design capacity of over 260 million gallons per day (mgd) is \$113.5 million, expressed in 2007 dollars. Additional capital costs for flow equalization facilities and annual costs of ultraviolet disinfection system operation are not included.

In summary, application of the "mussels present" criteria in California (and perhaps other locations in the West) will have significant compliance ramifications for municipal wastewater treatment plants that already have implemented ammonia removal treatment processes but discharge to receiving waters with no dilution credit. This would result in significant additional capital and operational expenditures in these communities and reinforces the need to properly characterize these criteria prior to their incorporation into binding and enforceable NPDES permits.

In addition to the comments presented herein, TriTAC has reviewed and endorses the comments submitted on the Draft 2009 Update by the National Association of Clean Water Agencies (NACWA).

Thank you again for the opportunity to provide these comments.

Sincerely,



Ben Horenstein
Chair, Tri-TAC