March 27, 2015

Geotechnical
Environmental
Water Resources
Ecological

John Heggeness
Nevada Division of Environmental Protection
Bureau of Water Quality Planning
901 S. Stewart Street, Suite 4001
Carson City, Nevada 89701

Re: Proposal to Support the Use of Biotic Ligand Model for Copper Aquatic Life Criteria in Nevada

Dear Mr. Heggeness,

We would like to participate in the upcoming Nevada Division of Environmental Protection (NDEP) triennial review of surface water quality standards on behalf of our client, the Copper Development Association (CDA). CDA played a significant role in sponsoring scientific research used in development of the freshwater Biotic Ligand Model (BLM) for copper, which was adopted by the United States Environmental Protection Agency (USEPA) in its latest national ambient water quality criteria (USEPA 2007). CDA is now interested in encouraging efforts by states and tribes to incorporate these latest recommended USEPA national criteria for copper into their water quality standards programs.

It is our understanding that the NDEP is in the process of accepting suggestions to modify Nevada Administrative Code (NAC), Chapter 445A.11704 - 445A.2234 and is currently accepting stakeholder comments until March 31st 2015. The purpose of this letter is to encourage the NDEP to consider updating their standards to allow the use of BLM to calculate aquatic life criteria for copper, as currently recommended by USEPA.

With respect to the amendments to water quality standards, we suggest the following addition:

- Replace the hardness-based acute and chronic copper aquatic life criteria equations in the *NAC445A.1236 Standards for toxic materials applicable to designated waters* table with a new footnote that would state: "Freshwater copper criteria to be calculated utilizing the procedures identified in EPA's Aquatic Life Ambient Freshwater Quality Criteria – Copper (2007), EPA-822-R-07-001."

Incorporation of the BLM as the basis for copper standards has already been adopted, or is being considered, by over half the states across the country, while Nevada's current aquatic life criteria used to derive copper standards only take into account hardness as a factor that modifies toxicity. Using only hardness as a

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modifying factor for metals criteria is an outdated approach that excludes a substantial body of peer-reviewed scientific literature demonstrating that additional modifying factors can and should be incorporated into regulatory benchmarks or standards, while providing the same levels of aquatic life protection required under the Clean Water Act (USEPA 1985, 1994, 2001, 2007). Like most metals, copper toxicity is a function of its bioavailability, which in addition to being controlled by hardness, is also strongly related to other important factors such as dissolved organic carbon (DOC), alkalinity, pH, and temperature. The key strength of the BLM is that it accounts for multiple factors—in addition to hardness—that mitigate or exacerbate copper's toxic effect on aquatic life.

Similar to copper, BLMs have been developed, validated, and are available for regulatory use for several other metals, including zinc, lead, nickel, and cadmium. While EPA has yet to develop formal recommended national ambient water quality criteria using BLMs for these other metals, the models are widely available (e.g., for zinc BLM-based criteria, see DeForest and Van Genderen 2012) and are being applied in regulatory programs in several European countries and Canada. CDA fully supports and shares their desire to move towards bioavailability models such as the BLM as being the current state of both scientific and regulatory practice.

There also are practical advantages for using the BLM; it is a cost effective regulatory tool compared to other site-specific toxicity test procedures (e.g., water-effect ratios), and the BLM software is publicly available, sanctioned by USEPA, and requires only brief training to generate rapid and useable output. While the model is widely considered to be useful for derivation of site-specific water quality criteria, we suggest its best application is on a state-wide basis for any discharger with sufficient water quality data to run the BLM. This would enable individual permit writers and permittees to collaborate directly to use the BLM to derive permit limits, thereby minimizing or eliminating the need to go through a lengthy and expensive rulemaking process. BLM-based criteria provide a practical means of deriving demonstrably more accurate levels of aquatic life protection across a broad range of water quality conditions, and with sufficient flexibility to support most any regulatory application framework.

Please let us know how we can assist the NDEP in its consideration of the BLM during this review. GEI or CDA could help in a variety of ways, including preparation of written or oral testimony supporting the technical basis of the BLM, or providing guidance on application of the BLM to water quality criteria and what type of implementation approach would best fit your available datasets. CDA has also sponsored BLM training sessions over the past several years, and they have been well-attended by both regulators and the regulated community. If desired, it may be possible to provide this course or related education materials if you would find that helpful as a means of helping inform the public and stakeholders as to the basis and application of the BLM.

We appreciate the opportunity to provide you with these comments in support of your proposal. Please let us know if you have any questions. We look forward to discussing this with you further.

Sincerely,

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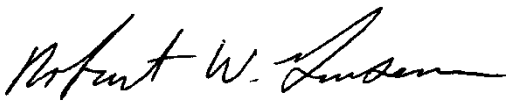

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RWG
cc: Robert Dwyer, CDA
Steven Canton, GEI
John Gondek, GEI
David DeForest, Windward Environmental
Eric Van Genderen, International Zinc Association

References

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U.S. Environmental Protection Agency (USEPA). 1985. Guidelines for deriving numerical national water quality criteria for the protection of the aquatic organisms and their uses. PB85-227049, U.S. Environmental Protection Agency, Washington, DC.

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