Association of Metropolitan Sewerage Agencies

January 30, 2004

Water Docket
EPA Docket Center
Environmental Protection Agency
Mailcode 4101T
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460
Attention Docket ID No. OW-2001-0010

RE: NOTICE OF AVAILABILITY OF REVISED DRAFT AQUATIC LIFE CRITERIA DOCUMENT FOR ATRAZINE AND REQUEST FOR SCIENTIFIC VIEWS

The Association of Metropolitan Sewerage Agencies (AMSA or the Association) appreciates the opportunity to provide scientific views on the U.S. Environmental Protection Agency's (EPA or the Agency) revised draft aquatic life criteria document for atrazine. Founded in 1970, AMSA represents the interests of nearly 300 of the nation's publicly owned treatment works (POTWs). These member POTWs serve the majority of the sewered population in the United States and collectively treat and reclaim over 18 billion gallons of wastewater every day. Tasked with meeting National Pollutant Discharge Elimination System (NPDES) permit limits based on water quality criteria, oftentimes with little control over what enters the treatment plant, AMSA members have a vested interest in ensuring that all criteria are based on sound science.

In particular, AMSA believes corrections should be made in the determination of the freshwater Final Plant Value (FPV) for atrazine of 17.25 µg/L, and believes that several summary statements made in the document are misleading. AMSA is also concerned about the lack of stakeholder review of the specifics of the proposed proprietary model used for the freshwater chronic criterion. Finally, the Association is concerned about the practicality of implementing a proprietary model as a water quality criterion, and recommends that the Agency instead issue a numerical freshwater chronic water quality criterion, allowing site-specific modification of the criterion where flexibility is needed.

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General Comments

As a general comment, AMSA is concerned with the inclusion of ecosystem and meso-microcosm studies in the development of water quality criteria. Proponents of individual species toxicity testing claim that results from these tests are predictive of in-stream effects. These claims have at least been partially supported with some dissension by EPA research. If in fact this is true, the need to incorporate results from ecosystem, micro- and mesocosm studies would seem to be unnecessary and use of these studies other than to identify particularly sensitive species may confound the typically more robust single species laboratory exposure results. However, if single species toxicity testing is determined not to be an appropriate predictor of ecosystem effects, the need and requirement for inclusion of single species whole effluent toxicity testing in NPDES permits would need to be reconsidered.

Additionally, the proposed freshwater chronic criterion is based on the Comprehensive Aquatic Systems Model (CASM), a proprietary model. Since some wastewater treatment plants discharge to freshwater effluent-dominated waterbodies, the proposed freshwater chronic criterion could potentially be applied directly to those wastewater treatment plants as an effluent limitation, if adopted by EPA and the applicable state. To determine compliance with the freshwater chronic criterion, POTWs would need to run this complex, proprietary model even though it is unlikely that atrazine is present at concentrations of concern. Although there are published papers describing the model, CASM itself is not available for review, so POTWs have no means of providing scientific comments. Furthermore, AMSA cannot estimate cost or levels of technical skill that would be involved in using the model for compliance evaluations. For these reasons, AMSA believes that proprietary models are not suitable as the basis for water quality criteria.

Furthermore, it appears that EPA has proposed that the "Average Primary Producer Steinhaus Similarity Deviation" has been established as the water quality criteria for freshwater chronic effects. It is AMSA's understanding that the criteria as envisioned by EPA is the concentration of atrazine that causes a change in plant communities in excess of a 5% deviation in the Average Primary Producer Steinhaus Similarity as determined from mesocosm studies. AMSA understands that EPA is not proposing, at this time, the atrazine concentrations in table 2 of the October 31, 2003 Revised Atrazine Interim Record of Decision (IRED) as criteria values and that mesocosm data are not required for the adoption of criteria. AMSA urges the Agency to clarify its intent on this point in the final documents it releases on this issue.

However, to avoid the use of a proprietary model and simplify implementation of the proposed atrazine freshwater chronic criterion, AMSA recommends instead that a numerical water quality criterion be promulgated. An option to use a model such as the CASM model as an alternative to the water quality criteria could be allowed if necessary. AMSA recommends that EPA consider two methods of setting such a water quality criterion. One method is to simply use the freshwater Final Plant Value (FPV), as was done to establish the saltwater chronic water quality criterion. The other is to use the screening concentration recommended by the Atrazine Ecological Subgroup in its "Atrazine MOA Ecological Subgroups: Recommendations for aquatic community Level of Concern (LOC) and method to apply LOC(s) to monitoring data," published by the EPA in the appendices to the IRED for atrazine. This document includes screening levels for atrazine developed based on CASM simulations with time-variable exposure scenarios (*see* page 9 of the document.) Assuming an acceptable prediction error of only 2% (i.e., at the 98th percentile), the estimated time weighted screening value for a 30-day average

atrazine concentration would be 27.1 µg/L. Figure 6 of the same document, "Proposed steps to analyze the potential ecological impact of atrazine based on the monitoring data," (*see* page 10 of the document) indicates the proposed steps to analyze the potential ecological impact of atrazine based on monitoring data. Examination of Figure 6 indicates that the proposed recommendation is that if a 30-day rolling average concentration is less than 27 µg/L, that the atrazine concentration be considered of "no concern" and the CASM model need not be run. It is not clear why this recommendation was dropped when the Atrazine Ecological Subgroup Report was put into the revised draft aquatic life criteria document for atrazine, but AMSA feels that using this recommendation would provide a reasonable means of screening to determine if atrazine is present at concentrations of concern.

Specific Comments

Page 55. The proposal states that atrazine toxicity to plants "commonly occurs at concentrations of 10 ug/L and above with several reports of toxicity to specific plant taxa at concentrations below 10 ug/L".

Based upon the information contained in Table 4, Toxicity of Atrazine to Aquatic Plants, toxicity to aquatic plants is rarely observed at concentrations of 10 µg/L atrazine. It is important to note when reviewing Table 4 that EPA definitions in promulgated chronic toxicity testing protocols specify that the NOEC is a "safe" or "non-toxic" concentration and that the LOEC should be considered as a "toxic" concentration. Additionally, the EPA Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001 PB91-127415) identifies the EC25 as being analogous to the NOEC or "safe" concentration so effects less than 25% such as the reported EC10 should also be considered "safe" or non-toxic. Furthermore, in the few instances indicating high levels of sensitivity, additional experimentation using the same species and similar test design most often resulted in significantly greater tolerances to atrazine. This is most obvious with the *Selenastrum* and *Lemna* genera. A more accurate representation of the Table 4 results would be that atrazine toxicity to plants "most commonly occurs at concentrations greater than 50 µg/L atrazine".

Page 24. The proposal states that ecosystem parameters have most frequently been observed to be adversely affected at concentrations exceeding 10 µg/L atrazine. While this statement is technically true, it is misleading. In the same paragraph a summary is provided of the results of Giddings and Biever (1994) that states "concentrations of 20 µg/L or less typically caused minor effects, if any, on primary production and plant community composition, and recovery occurred quickly, even if atrazine remained in the system." This summary is a more appropriate representation of the data.

Page 16. Text Table A - Calculation of Species Mean Acute Values (SMAV), Genus Mean Acute Values (GMCV) and Final Plant Value (FPV). Considering atrazine's targeted effects on plants, AMSA understands the Agency's use of plant toxicity data to develop acute and chronic values. However, the 1985 EPA guidance for deriving water quality criteria indicates that a FPV should be calculated for tests using aquatic plants and algae and are not amenable for calculating acute and chronic values. This is presumably due to the difficulty in quantifying what specifically is an acute response as opposed to a chronic response. It is the Association's opinion that the results of what the authors identified as "acute" plant results could also be incorporated into the chronic calculations for instances where no concurrent "chronic" results were reported in the study. Calculations were made assuming a linear relationship (no

threshold), using one half of the EC50 to estimate an EC25 ("safe, non-toxic effect) which was used as a "chronic" estimate for tests in Text Table A in which an acute result was used with no corresponding chronic result. Since EPA has defined the EC/IC25 as analogous to the NOEC, the use of this estimate as a chronic value will likely be an under-estimate (conservative) of the "true" chronic value. This results in inclusion of SMCV and GMCV values for the *Chalmydomonas* species and changes to the SMCV and GMCV values for the *Selenastrum* species. Please refer to the attached table containing the updated results.

Additionally, the frond biomass endpoint in the Hoberg study found in Table 4 (page 75) appears to have been omitted in the calculation of SMCV for *Lemna gibba* and the GMCV calculation for *Lemna* sp. It is noted that results from different endpoints were included in the SMCV calculation for other species also contained in Text Table A (page 16) and it is not clear why this endpoint was excluded for *Lemna gibba*. Inclusion of this result increases the SMCV for *Lemna gibba* as well as the GMCV for *Lemna*. The accompanying table includes these changes.

Therefore, the FPV for atrazine, considering the recommended chronic values for *Chalmydomonas* and *Selenastrum* as well as the frond biomass endpoint for Lemna gibba, should be 19.6 µg/L

Thank you again for the opportunity to provide comments on the proposed criteria. Should you have any questions, please contact me at 202/833-9106, or by email at *chornback@amsa-cleanwater.org*.

Sincerely,

Chris Hornback
Director, Regulatory Affairs

Species	**Acute Value (EC50)**	**SMAV (µg/L)**	**GMAV (µg/L)**	**NOEC-LOEC or *Estimated EC25* (µg/L)**	**Chronic Value (µg/L)**	**SMCV (µg/L)**
Green alga *Chalamydomonas reinhardtii*	51	51		*25.5*	*25.5*	
Green alga *Chalamydomonas reinhardtii*	51	51	**51**	*25.5*	*25.5*	***25.5***
Green alga *Selenastrum Capricornutum*	4			0.5 – 1.0	0.7071	
Green alga *Selenastrum Capricornutum*	130			76 – 130	99.398	
Green alga *Selenastrum Capricornutum*	128.2	40.55	**40.55**	*20.28*	*20.28*	***11.25***
Duckweed *Lemna gibba*	180			<3.4 – 3.4	3.4	
Duckweed *Lemna gibba*	50	94.89		8.3 - 18	12.2	
Duckweed[a] *Lemna gibba*				7.7 – 17	11.4	***7.79***
Duckweed *Lemna minor*	56	56	**72.89**	10 - 100	31.62	
Duckweed *Lemna minor*	--	--	--	38 - 120	67.5	**46.19**
Elodea *Elodea Canadensis*	--	--	--	20 - 30	24.49	
Elodea *Elodea Canadensis*	1,200	1,200	**1,200**	10 - 100	31.62	**27.83**

a – data found in Table 4 (page 75) but not included in SMCV calculation in test Table A (page 16).