

ANNOUNCEMENT OF SETAC EXPERT ADVISORY PANELS ON WHOLE EFFLUENT TOXICITY ISSUES AND SOLICITATION OF PROBLEMS FOR CONSIDERATION

Effluent biomonitoring has been used as a means to protect biological resources in receiving waters since the early 1940's. During the past decade, whole effluent toxicity (WET) testing has become a major component of the U.S. Environmental Protection Agency's (USEPA) National Pollutant Discharge Elimination System (NPDES) to ensure that "no toxics in toxic amounts" are discharged into the Nation's waters. The use of exposure assessment, coupled with effects assessment (effluent toxicity), for deriving the discharge limits imposed by permitting authorities has been subject to considerable debate in the technical and policy arenas.

The Society of Environmental Toxicology and Chemistry (SETAC) provides a balanced, objective forum of academic, government, and industry membership and has convened technical forums to assist the scientific community and regulators at the forefront of the development of effluent risk assessment. The first of two SETAC Pellston workshops on effluent biomonitoring was convened in 1982 (Bergman et al. 1986). Following that workshop, the science of effluent risk assessment moved forward and applications of biomonitoring were incorporated into the regulatory process for discharge monitoring. A second Pellston workshop on WET in 1995 (Grothe et al. 1996) dealt with specific technical issues arising from implementation of effluent toxicity testing. The major conclusions of this workshop, reported to the public in an open forum in December 1995, were:

- Existing WET testing methods (Weber et al. 1988, 1989; Weber 1993) are technically sound, but certain modifications would improve endpoint interpretation. Such changes involve implementing improvements to currently used statistical procedures, establishing acceptable limits for minimum significant difference values, and adding confidence limits to test endpoints.
- All toxicity tests have some degree of within-test, within-laboratory, and between-laboratory variability. Variability in the use of both WET test methods and bioassessment techniques influences test interpretation and acceptability and, thereby, influences the extrapolation of WET tests results to field impacts.
- A number of problems with WET tests are caused by misapplication of the tests, misinterpretation of data, lack of competence of the laboratories conducting WET testing, poor condition/health of test organisms, and lack of training of laboratory personnel, regulators, and permittees. More widespread use of WET-related guidance provided in EPA's Technical Support Document for Water Quality Based Toxics Control (1991) would help to alleviate some of these problems. In addition, an effective QA/QC program will improve data quality and reduce test variability. WET testing is an effective tool for predicting impact in effluent-dominated, lotic receiving systems. Additional laboratory-to-field validation efforts for these types of ecosystems are not essential for the continued use of WET testing as a component of the NPDES permits program. However, field bioassessment approaches are needed to compensate for the limitations of WET tests to predict phytotoxicity, sediment toxicity, bioaccumulation, genotoxicity,

indirect biotic effects, and effects of persistent chemicals, and to predict effects for different ecosystems such as wetlands, estuaries, and large rivers.

- Current WET permit limits have more than sufficient margins of safety such that episodic exceedences should not cause receiving water impacts. The conservative nature of these limits can, in some cases, result in requirements that are overprotective of the receiving system. The significance of an exceedence of WET limits depends on receiving water conditions, especially the effluent dilution at the time of exceedence, and the duration of the toxic event. Results from in-situ testing, ambient toxicity testing, and bioassessments were judged to be useful in evaluating WET limits and margins of safety. In addition, the potential for underestimation of WET chronic estimates needs to be considered in the application of WET data in situations where conservative factors are absent from exposure calculations/predictions.
- Effluent toxicity is one of several factors that can adversely impact biological communities, but it is not always the major cause of observed effects. Careful thought must be given to selecting appropriate reference conditions for field assessments. Regional reference conditions strengthen assessments of receiving water impacts and facilitate the characterization of natural variation.

The published proceedings from this workshop are now available in a peer-reviewed book published by SETAC Press (Grothe et al. 1996).

After the 1995 Pellston workshop, the USEPA conducted several meetings to invite interested parties to voice opinions on issues surrounding whole effluent toxicity. The USEPA wanted to ensure that the technical bases for the use of WET testing, toxicity identification evaluations (TIEs), and toxicity reduction evaluations (TREs) were founded on sound scientific principles. To ensure that sound scientific principles are applied to the challenging issues in the WET program, the SETAC Foundation for Environmental Education was awarded a cooperative agreement from the USEPA to provide expert advice related to the technical aspects of WET testing. Under this cooperative agreement, a balanced steering committee comprised of experts from academia, government, and industry will provide guidance to expert advisory panels who will be selected to address specific issues selected by the steering committee. As part of the process for identifying priority WET issues, SETAC is soliciting recommendations from interested parties (e.g., those who are required to perform WET testing or use the results of WET testing in regulating/monitoring effluent discharges) for consideration by the expert advisory panels. We will avoid dealing with WET problems that can be reasonably and expeditiously handled by existing commercial groups who provide services in this business area (e.g., standard TREs and TIEs), and the expert advisory panels will not address situations presently involved with ongoing or pending legal proceedings. For example, because of pending suits that are related to the recently released WET test methods (Federal Register 60(199), October 16, 1995), the expert advisory panels will not examine issues specifically related to the promulgated methods. As is true of all activities conducted by SETAC, the expert advisory panels that have been formed to address the selected issues are comprised of approximately equal numbers of representatives from academia, business, and government. The specific problems recommended for consideration by the expert advisory panels must be such that they

can be addressed in this neutral, objective forum.

SETAC invites interested persons to submit their succinctly described priority issues in a maximum of two pages. You may also provide 20 pages or fewer of additional material as relevant background. Your submission should include:

- 1) a description of the problem,
- 2) a description of efforts that have already been implemented to try to correct the problem, and
- 3) a person who can provide additional background information and answers to follow-up questions.

The issues received by the SETAC Office will be prioritized by the expert advisory panels steering committee based on:

- Issues for which solutions might lead to large cost savings (e.g., sites with high discharge volumes that require significant amounts of treatment).
- Issues that provide good examples or case-studies that are generally applicable to a wide variety of sites.
- Issues that cover a wide range of geographic areas and discharge types.

Please submit the descriptions of WET issues that you would like to see evaluated by the SETAC expert advisory panels to:

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Questions about this program should be addressed to Greg Schiefer at the above address.

References

Bergman HL, Kimerle RA, Maki AW. 1986. Environmental hazard assessment of effluents. Elmsford NY: Pergamon Press.

Grothe DR, Dickson KL, Reed-Judkins DK, editors. 1996. Whole effluent toxicity testing: an evaluation of methods and prediction of receiving system impacts. SETAC Pellston Workshop on Whole Effluent Toxicity; 1995 Sep 16-24; Pellston, MI. Pensacola, FL: SETAC Pr. 346 p.

Weber CI, editor. 1993. Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms. 4th ed. Cincinnati: U.S. Environmental Protection Agency (USEPA) Office of Research and Development. EPA/600/4-90/027F.

Weber CI, Horning WB, Klemm DJ, Neiheisel TW, Lewis PA, Robinson EL, Menkedick JR, Kessler F, editors. 1988. Short-term methods for estimating the chronic toxicity of

effluents and receiving waters to marine and estuarine organisms. Cincinnati, OH: U.S. Environmental Protection Agency (USEPA) Office of Research and Development. EPA/600/4-87/028.

Weber CI, Peltier WH, Norberg-King TJ, Horning WB, Kessler FA, Menkedick JR, Neiheisel TW, Lewis PA, Klemm DJ, Pickering QH, Robinson EL, Lazorchak JM, Wymer LJ, Freyberg RW, editors. 1989. Short-term methods for estimating the chronic toxicity of effluents and receiving waters to freshwater organisms. 2nd ed. Cincinnati: U.S. Environmental Protection Agency (USEPA) Office of Research and Development. EPA/600/4-89/001.

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Questions, comments, and requests should be e-mailed to:
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