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Julie Roth, Executive Director
DSCSOC

Julie,

You may recall that several years ago I brought to the attention of DSCSOC (and, through DSCSOC, to the attention of the UCD/DOE LEHR national Superfund site RPMs and PRPs) the technically invalid approach that the University of California, Davis, was using in attempting to conduct an ecological risk assessment for the LEHR site for pollutants in aquatic sediments associated with the site. The problem was that UCD's initial contractor for the ecological risk assessment proposed to use the Long and Morgan and/or MacDonald cooccurrence-based sediment quality guidelines as pass-fail indicators of whether a particular aquatic sediment and its associated potential pollutants represented a potential ecological risk. At the time this first surfaced, I provided DSCSOC a detailed discussion from my own work, as well as that of others, on the unreliability of that approach.

Subsequently, in a revised draft of its ecological risk assessment, UCD proposed to continue this technically invalid approach. I suggested to DSCSOC that a formal request be made of the US EPA Region 9 administrator to review this approach. Ned Black of the US EPA Region 9 responded to this request, indicating that the US EPA Region 9 considers the Long and Morgan cooccurrence-based approach to be technically valid. When I pointed out the significant errors that N. Black made in his assessment, P. Collins, then the US EPA RPM for the LEHR site, commented that my comments were unprofessional. A review of my comments would not support her assessment. I felt it was necessary to point out that the US EPA Region 9 was continuing to make a significant error in allowing cooccurrence-based sediment quality guidelines to be used as pass-fail bright-line regulatory limits for evaluating sediment quality.

As I discussed in my comments, there are a number of examples where the US EPA Region 9 has used this approach, such as their support for the Santa Monica Bay Restoration Program, and establishing Superfund cleanup objectives for Upper and Lower Newport Bay. Now the LEHR site has been added to the list of "horror stories" that have been developed on the inappropriate use of cooccurrence-based sediment quality guidelines. This unreliable approach will ultimately cost the public many millions of dollars in inappropriate remediation approaches based on a technically invalid approach for assessing sediment quality.

It is important to understand that these are not just my views on this subject. These views are widely held by those who understand aquatic chemistry and aquatic toxicology, including Ed

Long, who was an original co-developer of this approach. Ed Long is a member of the California State Water Resources Control Board's SQO Scientific Steering Committee advising the State Board on the approach that should be used to develop sediment quality objectives (SQOs). At a meeting of this expert panel held on July 17, 2006, Ed Long, with respect to misuse of this approach by regulatory agencies and others, stated,

> *"My lingering concern is that, based on my experience with the values that I published, that despite any large-font, bold-print warnings against doing so, people will tend to use your single chemical values in a regulatory framework. I was aghast to find after I retired from NOAA and got into the reality of working with industrial clients, that there are state and federal judges in this country that are using my values as regulatory values on a single chemical basis.*
> * * *
> *My fear still is that people will come in and say, 'Ah. Here is a value of xyz for mercury or for lead or for zinc,' and they will regulate on that single value."*

I am following up on this situation since one of the points that I made in my comments was that the California State Water Resources Control Board (SWRCB) was at that time conducting an over $2-million study of the relationship between the chemical composition of aquatic sediments, sediment toxicity, and the associated benthic organism assemblages in the sediments as part of developing sediment quality objectives for the state. This effort included detailed review of it by an international panel of experts (the SQO Scientific Steering Committee), who helped guide the development, implementation and reporting of the results.

I wish to bring to DSCSOC's attention that the State Water Resources Control Board has posted the results of its sediment quality objective development for review and comment. The SWRCB staff and the investigators who conducted these studies, as well as the SQO Scientific Steering Committee, are unanimous in resoundingly pointing out (as in the above quote by Ed Long) the inappropriateness of using cooccurrence-based sediment quality guidelines as bright-line pass-fail limits to evaluate sediment quality. While there was a substantial literature on this issue at the time the SWRCB started this effort, now there are several million dollars of data generated in California which show that the total concentration of a particular chemical in sediments is not a reliable indicator of sediment quality. The sediment quality objectives being developed by the SWRCB are based on an integrated use of chemical composition, aquatic life toxicity and benthic organism assemblages. None of these are reliable as an individual tool for assessment. Their combined use can give an indication of potential sediment quality problems that then must be followed up by additional studies.

In my comments on the inappropriateness of UCD's using the cooccurrence-based approach and US EPA Region 9 (and, for that matter, the other RPMs) approving this approach, I pointed out that, rather than trying to estimate sediment toxicity based on cooccurrence-based values, the toxicity of the sediments should be measured directly, using standard US EPA testing protocols. If the sediments are found to be toxic, then an assessment should be made as to whether the numbers and types of benthic organisms associated with the sediments are significantly altered compared to those that would be expected based on habitat characteristics. This is the approach that should be followed in an ecological risk assessment.

I am suggesting that the RPMs for the LEHR Superfund site, and especially US EPA Region 9, may wish to comment on what they believe to be the inappropriate approach that the SWRCB has developed for evaluating sediment quality. If the US EPA Region 9 and the other RPMs believe that the SWRCB, its scientific consultants and the SQO Scientific Steering Committee have made a significant error in concluding that Long and Morgan or MacDonald's cooccurrence-based sediment quality guidelines are not reliable for evaluating sediment quality, then they should provide justification for this position. Otherwise, it will be concluded that the US EPA Region 9 and others who support this position have allowed a technically invalid approach to be used for the ecological risk assessment at the UCD/DOE LEHR Superfund site.

The SWRCB draft reports covering this issue are available at
http://www.waterboards.ca.gov/bptcp/sediment.html

The deadline for comments listed on this webpage as November 16, 2006, has been extended to November 28, 2006, at 5:00 p.m.

I suggest you may want to pass this on to the RPMs and PRPs. If there are questions about these comments, please contact me.

Fred