September 4, 2003

via email

Julie Roth, Executive Director
DSCSOC

Subject: Additional Information on Regulating Mercury

Julie,

At the last RPM meeting, you made available hardcopies of an email that I had sent you the day before, regarding the US EPA approving the Central Valley Regional Water Quality Control Board's proposed Clean Water Act 303(d) listing of Lower Putah Creek as an impaired waterbody due to excessive mercury concentrations in Putah Creek fish.

As indicated in the email, this 303(d) listing means that the discharges of mercury above the water quality objective in wastewaters and stormwater runoff must be controlled as part of an overall TMDL to achieve the water quality objective. During the discussion of this issue at the RPM meeting, questions were raised about the water quality objective that is applicable to this situation. As I indicated, the US EPA, as part of developing the California Toxics Rule, changed the approach that it had been using for regulating mercury, with the result that the water quality criterion for mercury was raised from 12 ng/L total recoverable mercury to 50 ng/L total recoverable mercury. However, this was recognized as an interim value, and not a "safe" concentration that would prevent excessive mercury bioaccumulation in edible fish tissue. The critical concentration to avoid excessive mercury bioaccumulation is estimated to be about 5 ng/L.

The US EPA is also in the process of changing how it regulates mercury and other bioaccumulatable chemicals. The new approach is based on the tissue residue in fish of about 0.3 mg mercury per kg fish tissue, wet weight. In order to establish a site-specific regulatory approach, the Agency is recommending that a site-specific translator be developed for mercury concentrations in the water column that empirically relates to mercury concentrations in edible fish tissue. While the Agency has a *Federal Register* notice of its intent to regulate mercury using this approach, this has not been officially adopted.

At the RPM meeting I mentioned that, as part of my work on mercury associated with CVRWQCB mercury investigation and control programs in various California waterbody settings, I have recently developed a write-up discussing regulatory approaches for controlling excessive mercury. This write-up is referenced as,

> Lee, G. F., "Regulating Mercury in the Water Column and Sediments" Report to Dredge Tailings Workgroup, by G. Fred Lee & Associates, El Macero, CA (2003). http://www.gfredlee.com/TotalMercuryandDissolvedMercuryStandards-rev.pdf

The write-up on regulating mercury includes information I obtained from Phil Woods. Phil is head of the US EPA Region 9 Water Quality Criteria section and is knowledgeable on mercury, as well as other chemical issues.

I also mentioned in my discussions of these issues that Dr. Chris Foe has been leading a group of investigators in what is now an $11-million effort supported by California Bay-Delta Authority in investigating approaches that can be used to control excessive mercury bioaccumulation in Central Valley waterbody fish. Recently this group has completed a set of draft reports and undergone an external peer review of the work that has been done. This information is available at http://loer.tamug.tamu.edu/calfed/DraftReports.htm.

As I indicated at the meeting, it is Dr. Foe and the group's finding that all sources and forms of mercury can be converted in the right environment to methylmercury, which then can bioaccumulate to excessive levels in edible fish tissue. The situation that leads to methylation of mercury is a source of mercury and the presence of organic carbon that can be used by certain forms of bacteria which exist just at the transition between oxic (oxygen-containing) and anoxic (oxygen-free) environments, such as near the sediment water interface in streams, rivers, lakes and wetlands.

If you have questions about these issues, please contact me. If I do not know the answer to your questions, I can put you in touch with someone who may be able to answer them.

G. Fred Lee