



BREN SCHOOL OF ENVIRONMENTAL SCIENCE & MANAGEMENT  
JOHN MELACK, PROFESSOR

SANTA BARBARA, CA 93106  
<http://www.bren.ucsb.edu/>

29 July 2013  
Amended 20 August 2013

Betty Yee  
California Regional Water Quality Control Board, Central Valley Region  
11020 Sun Center Drive #200  
Rancho Cordova, CA 95670

Re: Peer Review of Proposed Basin Plan Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to Add Policies for Variances and Exceptions

Dear Ms Yee:

I have examined the material, including that on the CDs, sent on 19 July 2013 with regard to the proposed variances in electrical conductance, total dissolved salts, chloride, sulfate and sodium for discharges subjected to NPDES permits in the Sacramento and San Joaquin river basins and Tulare Lake basin. Based on the material provided, I understand: 1) that the beneficial uses sensitive to salinity include agricultural supply, municipal and domestic supply, industrial service supply, ground water recharge and fish and wildlife uses; and 2) that results from case studies of representative NPDES discharges in the basins indicate that water quality improvements caused by source control programs, facility upgrades and source water replacements were not sufficient to comply with effluent limitations.

My examination of the materials focused on those or parts of the documents most directly relevant to the issue of the variances. While serving on the Independent Science Board for the CalFed Bay-Delta Program, I became somewhat familiar with development and applications of the DSM2 model. Hence, my reading of the numerous annual reports and technical details about the DSM2 model was cursory.

Given the mandate that the external review determine whether the scientific portion of the proposed rule is based upon 'sound scientific knowledge, methods and practices', only a fraction of the material provided scientific information or analysis, and my assessment is based largely on my understanding of options to reduce salinity and the likely incremental consequences of the slight exceedances. The application of the well-tested and honed DSM2 model to the evaluation of impacts of effluents from Tracy leads to credible, if somewhat complex, results. Among materials provided about Fresno-Clovis, the cost estimates for reverse osmosis and the review of salinity effects on crops are

August 20, 2013

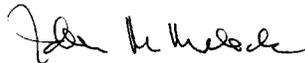
sound. The memorandum (December 2012) from Larry Walker Associates is especially pertinent and provides reasonable calculations of likely reductions in salinity based on treatment options. The method used to calculate groundwater quality is also included in the report from Larry Walker Associates. Though I am not an expert on groundwater water, I appreciate the complexity of modeling groundwater and its chemical composition. Though a simple mass balance approach was used, it was designed to be conservative, and indicated a gradual increase in groundwater salinity. Given the lack of detailed information on underground conditions, the approach seems reasonable.

As summarized by the Staff Report, modeling studies show that salinity reductions that would meet water quality based effluent limitations range from 1 to 18  $\mu\text{mhos/cm}$  within the vicinity of the discharge; these reductions are quite small. Indeed to attain these small reductions would require construction of expensive reverse osmosis facilities, which would, in turn, generate saline brine needing disposal and slight increases in greenhouse gas emissions.

If you need detailed evaluation of one or more of the reports provided, please let me know.

In conclusion, I concur with the Staff recommendations to adopt a salinity variance program for discharges subject to NPDES permits, as described on pages 28 to 33 of the Draft Staff Report (July 2013).

Sincerely,



John M. Melack  
Professor