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Karen Larsen
Senior Environmental Specialist
Sacramento River Watershed Unit
Central Valley Regional Water Quality Control Board
11020 Sun Center Drive, #200
Rancho Cordova, CA 95670

Re: Proposed basin plan amendment for Sulphur Creek

Dear Ms. Larsen:

I am writing in response to your request to review the document titled, "Amendment to the Water Quality Control Plan for the Sacramento and San Joaquin River Basins to Determine Certain Beneficial Uses are not Applicable and Establish Water Quality Objectives for Sulphur Creek". My review of the document is summarized below:

1. General comments: The review establishes the absence of domestic water supply uses and sport fishing on Sulphur Creek. The document adequately supports the assertion that these beneficial uses were absent because prior to mining and would be unlikely to return if the mines and mine tailings were removed from the system. If the high concentrations of salt in the river is related to natural sources, the only way to make the water suitable for drinking would be to employ reverse osmosis, which would be extremely expensive in this situation. As a result, the staff report recommends target values for Hg associated with particles of 9 mg/kg, which is based on the 2006 proposed TMDL (which I have not been asked to review) for high flow conditions and 850 ng/L total Hg target for low flow conditions. Overall, I believe that this approach is consistent with the objectives of the Basin Plan and is justified by the supporting data.
2. My main concern pertains to the 30-day average low-flow target of 850 ng/L. This value was based on a total of eight grab samples collected over a period of four years. The concentrations in these samples ranged from 300 to 1200 ng/L. Additional data on mercury concentrations in the natural geothermal springs indicate an average concentration of 940 ng/L and a maximum value of 1300 ng/L (p. 23 of the 2006 Sulphur Creek TMDL). I am unfamiliar with the monitoring regime that is being considered in this system, but it seems likely that future sampling will be limited to grab samples. Given the variation in concentrations in

the natural geothermal springs it appears that a value of 850 ng/L may be too stringent for any 30-day period. In my opinion, the practical aspects of achieving the low-flow target under natural background conditions should be considered more carefully in the document.

3. Somewhere in the executive summary or the body of the document it would be helpful to list the remaining beneficial uses after these changes are implemented.
4. Page 4, second full paragraph: I suspect that the authors meant “High sulfide concentrations...” and not “High sulfate concentrations...”
5. Errors in Table 1: The different chemical species in the heading of Table 1 appear to be incorrect (e.g., HCO_3^- and not HCO_3^3).
6. Throughout the report the data are expressed with an unreasonable and inconsistent number of significant figures. For example, as many as four significant figures are used in Table 1. None of these anions or cations can be measured with this high degree of precision. Likewise, the conductivity values and mercury concentrations cited on pages 6 and 7 as well as the tables in the appendices represent an unrealistic level of precision. The inconsistent use of significant figures implies a level of confidence in the data that is unreasonable and should be corrected.

Please feel free to contact me with any comments or questions.

Sincerely,

David L. Sedlak
Professor

cc: Professor David Jenkins