

Comments on SWRCB Review of South Delta Channel Water Quality

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On January 5-6, 2011 I listened to the SWRCB SJR flow and salinity workshop webcast and became concerned about the substantial amounts of inadequate and/or unreliable information on South Delta channel water quality that was being provided by some presenters. A review of several of the issues of concern is presented herein.

Old River Channel Null Zone Water Quality Issues

Of particular concern was the information presented on the water quality problems in the so-called "null zone" of Old River near the Tracy Boulevard Bridge. The water quality problems in that area are the direct result of the inadequate design of the rock barrier on the western side of this Old River channel. That deficiency was recognized and should have been corrected years ago by establishing induced flow through the channel. Without such flow, the potential pollutants derived from the SJR upstream and from in-Delta sources would be expected to accumulate in that area and lead to significant water quality problems.

In the early 2000s Alex Hildebrand suggested that the flow inadequacy through the South Delta channels caused by the inadequate design of the temporary rock barrier system could be solved by installing low-head pumps at the barriers to induce flow past the barriers. When J. Herrick in his presentation at the workshop suggested at the SWRCB SJR flow and salinity workshop that the low-head pump approach should be adopted, C. Hoppin, chair of the Board, responded that it would take a large number of such pumps to make that approach work. Hoppin's response implied that DWR or some other entity had conducted an adequate review of this matter and concluded that it would be too expensive to solve the null zone water circulation problems using that approach. The basis of his response notwithstanding, it is our position that the cost of properly solving the null zone Delta channel water quality problems should be borne by those who created the problem, i.e., the South Delta water exporters as part of the cost of exporting South Delta water for their use.

Dr. Jones-Lee and I discussed these problems in the following reports, as well as in several other reports that are on our website, www.gfredlee.com, in the Watershed Studies section, San Joaquin River Watershed - Delta subsection [<http://www.gfredlee.com/psjriv2.htm>].

Lee, G. F., and Jones-Lee, A., "Synthesis and Discussion of Findings on the Causes and Factors Influencing Low DO in the San Joaquin River Deep Water Ship Channel near Stockton, CA: Including 2002 Data," Report Submitted to SJR DO TMDL Steering Committee/Technical Advisory Committee and CALFED Bay-Delta Program, G. Fred Lee & Associates, El Macero, CA, March (2003).

<http://www.gfredlee.com/SJR-Delta/SynthesisRpt3-21-03.pdf>

Lee, G. F. and Jones-Lee, A., "Supplement to Synthesis Report on the Low-DO Problem in the SJR DWSC," Report of G. Fred Lee & Associates, El Macero, CA, June (2004).

<http://www.gfredlee.com/SJR-Delta/SynthRptSupp.pdf>

On August 5, 2004, at my request, Bill Jennings of the DeltaKeeper made available one of the Deltakeeper's boats, staff and crew to enable me to conduct a study of the South Delta channels from the SJR Head of Old River through the Old River channel that includes the Tracy Boulevard Bridge crossing to the rock barrier at the western end of the channel. We also made a run down Grant Line channel to the rock barrier. Several members of the Central Valley Regional Water Quality Control Board staff, as well as a representative of the US EPA Region 9, participated in this tour. During the tour we measured Secchi depth and electrical conductivity at selected locations in each channel. In the vicinity of the Tracy Boulevard Bridge's crossing the Old River channel, we observed several thousand threadfin shad floating on the surface of the water. Those fish had died the previous night/early morning. A check of the DWR monitoring station located in that area showed that in the early morning that day the DO had dropped to essentially zero. This was a likely cause of the fish kill. The water in that area of the channel was "pea soup" green due to planktonic algae. A similar condition occurs in the SJR DWSC when a high algal load associated with limited flow conditions leads to significant oxygen depletion. The findings of that tour are written up in the following report:

Lee, G. F., Jones-Lee, A., and Burr, K., "Results of the August 5, 2003 Tour of the South Delta Channels," Report of G. Fred Lee & Associates, El Macero, CA, February (2004).
<http://www.gfredlee.com/SJR-Delta/South-Delta-Tour.pdf>

These issues have also been discussed in our several reviews of Delta water quality issues that are provided on our website referenced above. Those channels are also listed as "impaired" due to low DO in the CVRWQCB/SWRCB/USEPA 2006 303 (d) listing. Such a listing should stimulate the SWRCB to begin to address this issue as part of its review of the impacts of SJR flow into and through the South Delta channels.

South Delta Irrigated Agriculture as a Source of Channel Salt

The SWRCB workshop discussion of South Delta channel salinity presented inadequate information on agriculture return water as a source of salinity for the channels. In 1989 I became involved in reviewing the characteristics of Delta channel water quality. One of the issues addressed was the impact of Delta island irrigation on water quality characteristics of Delta channel. Based on DWR's monitoring data it was found that the concentrations of conservative (non-reactive) chemical constituents such as EC in the Delta channel water taken for irrigation were typically about one-third those in the irrigation tailwater discharged back to the channel. The use of the channel water for irrigation did not add salts to the tailwater discharge, but rather concentrated the salts in the discharge waters due to removal of water from the irrigation waters. As discussed in our writings I have recommended that the SJR Vernalis EC criteria be set at a value that would allow irrigated agriculture to be practiced in the western Delta channels that would allow the build-up of salts in the channels due to upstream Delta channel evaporative concentration of salts in the irrigation water. Failure to follow this approach will lead to a situation where the ag interests in the channels downgradient from the Head of Old River will have excessive salts compared to those that can be present for unrestricted crop growth.

Impact of Delta Salinity on Domestic Water Quality/Groundwater Recharge

At the SWRCB workshop M. Gowdy provided information on the impact of salinity on beneficial uses of the Delta. I did not hear him state that increased salinity in the Delta is detrimental to southern California water utilities' use of Delta water as a source of domestic

water supply. It has been well-established that increased salinity in the South Delta waters is of concern to Southern California water utilities because of its impact on the ability to recharge domestic wastewater as part of enhanced groundwater replenishment. The combination of Delta-derived salinity and the increased salinity associated with using Delta water as a domestic water supply results in TDS levels in the domestic wastewaters that can exceed those allowed for the wastewater to be recharged to the area groundwater. This issue needs to be included among the impacts of increased salinity in the SJR watershed on exporter's use of Delta water as a domestic water supply.

Need for Comprehensive Review of South Delta Water Quality Issues

The providing of incomplete/inadequate information and discussion of the null zones and poor circulation in the South Delta channels exemplifies significant inadequacies in the approach being used to address the SJR watershed pollutant-associated water quality problems in the South Delta channels. Rather than a piecemeal approach of only addressing one pollutant (salinity), a comprehensive and integrated review of the all the known water quality problems in these channels should be conducted. These issues will become even more severe if the DWR/BDCP's proposed diversion of the Sacramento River water around/through the Delta as part of the proposed peripheral canal comes to pass and substantially increases the hydraulic residence times of SJR water in the South Delta. The whole South Delta will likely become a massive null zone. As we have repeatedly discussed in our reviews of Delta water quality issues there is need for a comprehensive review of all South Delta water quality problems that are caused by inadequate control of pollutants derived from SJR watershed activities that discharge pollutants to the SJR that cause water quality problems in the South Delta channels.

If there are questions on these comments, or if I can be of assistance in addressing these issues, please let me know.

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