Tim Stroshane
Remarks on Tunnels and Water Quality
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The Bay-Delta is the largest estuary on the west coast of North America. Its water quality is already seriously compromised by existing water diversion, and the legacies of Gold Rush-era mercury and agribusiness irrigation generating selenium-tainted drainage. The Governor's Fix is in: the Tunnels Project will dramatically worsen Bay-Delta estuary water quality. Here's how.

The Tunnels will export water badly needed to protect the Estuary's water quality. Tunnels modeling in the recirculated EIR shows that lower Sacramento River flows will decrease each month on average between 20 and 24 percent.[i] This will stagnate water in the Estuary compared to both current conditions and a future of climate change without the Tunnels.[ii] Lower-flow, more polluted San Joaquin River water will make up greater fractions of the western Delta, Franks Tract, and at Contra Costa Water District's Rock Slough intakes. Meanwhile, the Tunnels will export water of improved quality south of the Estuary, leaving Delta waters the poorer.[iii]

Harmful algal blooms are expected to increase due to the Tunnels, consuming most or all dissolved oxygen in the water, and suffocating oxygen-respiring organisms like fish. Blue-green algae, such as one species called *Microcystis*, can also produce "cyanotoxins" that pose a significant potential threat to wildlife, dogs, and human beings, and exposure can cause liver cancer in humans. Tunnels' reports acknowledge that "increases in the frequency, magnitude, and geographic extent of *Microcystis* blooms in the Delta would occur relative to Existing Conditions," increasing a dangerous ecological and public health threat.[iv]

More San Joaquin River water will result in more concentrated pesticides reaching central and western Delta water ways, and with more stagnant water, its pesticide burdens stay longer, including human carcinogens.

Mercury is activated ecologically when wetland sediments are wetted and disturbed. Bacteria in the sediments process mercury into "methyl mercury," making this toxin bio-available. Tunnels modeling this summer shows that, like last year's BDCP, the Tunnels Project would result in more than 1.5 to 2 times the USEPA's mercury guidance concentration for fish tissues.

Tunnels water exports would increase the frequency and reliability of irrigation deliveries to agricultural lands in the western San Joaquin Valley, lands with naturally-occurring high levels of selenium. Of course, ending these deliveries could reduce demand from the San Luis Unit of the Central Valley Project by up to a million acre-feet per year and dramatically improve delivery reliability for all other CVP contractors' allocations, without the investment of billions for the Tunnels project.

Finally, the Department of Water Resources and the Bureau of Reclamation need a Clean Water Act Section 404 permit from the US Army Corps of Engineers,[v] because construction of the Water Tunnels project will result in discharges of dredged or fill material and damage to existing Delta wetlands.[vi] DWR and the Bureau cannot receive their 404 permit from the Corps unless the State Water Resources Control Board issues a Section 401 certification for the Tunnels. For the Section 401 certification, the *entire project* must show it can be built and operated in such a way as to meet all water quality standards. This it will not do because of the flow regimes and toxics issues that I described earlier.

ENDNOTES

[i] Estimates derived by Restore the Delta from graphical analysis interpolating data in Figures 4.3.2-7 and 4.3.2-8 from the Recirculated Draft EIR/EIS, Section 4.3. See also Appendix B, Tables B.7-28, B.7-30, B.7-31, and B.7-34, for the Sacramento River downstream of the north Delta diversion facility, Sacramento River at Rio Vista, Delta outflow, and San Joaquin River flow at Vernalis, pp. B-357 to B-370. These tables show that most changes are *decreases* in flow of 5 percent or more compared with Existing Conditions and the No Action Alternative (especially along the Sacramento River downstream of the north Delta intakes. Only slight improvements occur in just a handful of months and water year types. Most San Joaquin River flows at Vernalis between February and September in most water year types decrease greater than 5 percent relative to existing conditions as well.

[ii] Here the California Department of Water Resources and its California WaterFix water-contractor partners opt for faith-based analysis of water quality impacts under Alternative 4A conditions. They opted not to conduct residence time modeling for the Recirculated Draft EIR/EIS, as they had done for Alternative 4 (with habitat restoration and Yolo Bypass improvements) in 2013 and 2014. "Under the two operational scenarios of Alternative 4A [California WaterFix], a portion of the Sacramento River water which would be conveyed through the Delta to the south Delta intakes under Existing Conditions would be replaced at various locations throughout the Delta by other source water due to diversion of Sacramento River water at the north Delta intake under Alternative 4A. The change in flow paths of water through the Delta that would occur under Alternative 4A could result in localized increases in residence time in various Delta sub-regions, and decreases in residence time in other areas. In general, *there is substantial uncertainty regarding the extent that operations and maintenance of Alternative 4A would result in a net increase in water residence times at various locations throughout the Delta relative to Existing Conditions*." (Emphasis added.) Bay Delta Conservation Plan/California WaterFix, Recirculated Draft EIR/EIS, Section 4.3.4, p. 4.3.4-67. DWR and its partners could not be troubled to model residence time behavior for Alternative 4A and the other California WaterFix alternatives (2D and 5A). However, the water source "fingerprinting" analyses in both last year's and this year's modeling appendices show replacement of good quality Sacramento River water with lower-flow and poorer quality San Joaquin River water, so it is reasonable, in the absence of more definitive modeling, that relative to existing conditions residence times will increase with the Tunnels project under both Alternatives 4 and 4A.

[iii] Bay Delta Conservation Plan Draft EIR/EIS, Appendix 8D (figures for Alternative 4, Scenarios H3 and H4), 2013; BDCP/California WaterFix, Recirculated Draft EIR/Supplemental Draft EIS, Appendix B, Section B.4.2 (figures for No Action Alternative, Alternative 4A, Scenarios H3 and H4), 2015; analyzed by Restore the Delta.

[iv] Bay Delta Conservation Plan/California WaterFix RDEIR/SDEIS, p. 4.3.4-67.

[v] Accessed September 15, 2015, at http://www.spk.usace.army.mil/Media/RegulatoryPublicNotices/tabid/1035/Article/616568/spk-2008-00861-california-waterfix-project.aspx.

[vi] "Many of the actions that will be implemented under the Water Tunnels project will result in the discharge of dredged or fill materials into waters of the United States and will need to be authorized by USACE."Public Draft Plan § 1.3.7.1 (Nov. 2013), available at: http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/Public_Draft_BDCP_Chapter_1_-_Introduction.sflb.ashx. This is no less true of intake construction of the "California WaterFix" version (Alternative 4A) of the Water Tunnels project.