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January 20, 2017

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Re: Bay-Delta Water Quality Control Plan

Dear Chairperson Marcus and Board Members:

This letter is to raise an issue relating to the ongoing Bay-Delta Water Quality Control Plan process whereby the State Water Resources Control Board ("SWRCB" or "Board") is updating certain water quality objectives. In Phase 1of that process, the SWRCB is examining and evaluating the San Joaquin River flow objectives for the protection of fish and wildlife

beneficial uses and the southern Delta salinity objectives for the protection of agricultural beneficial uses. As you know, the SWRCB recently released for review a recirculated substitute environmental document ("SED") which proposes changes to these two sets of objectives in that process.

For any such process to be fair, the involved state agency must abide by ethical and conflict of interest rules. This is to not only preserve the appearance of fairness but also to make sure no actual unfairness occurs. In this case it appears that the consultant to the SWRCB for the preparation of the SED is also publically taking a position on what changes should be made to the objectives. If so, those conflict of interest rules have been violated in the Bay-Delta process.

The SWRCB employs ICF International ("ICF") to assist it with the investigation and evaluation of the San Joaquin River flow and southern Delta salinity objectives. ICF assisted in the preparation of the initial SED and the recirculated SED (see SED September 2016, Chapter 24, page 24-2).

At the same time, ICF was retained by the Department of Water Resources to investigate salinity in the southern Delta. That effort resulted in the release last week of the report entitled *Evaluation of Salinity Patterns and Effects of Tidal Flows and Temporary Barriers in the South Delta Channels*, September 2016 (sic) ("Report"). A ***summary*** of the report previously appeared on the web at http://www.eposters.net/pdfs/evaluating-south-delta-salinity-sources-and-salinity-reduction-alternatives.pdf (attached). That summary of the Report contains, at the very end, the following paragraph:

> Modify the EC Objectives
>
> Based on this tidal flow and EC data analysis, the Vernalis and south Delta EC objectives could be modified to eliminate most periods of excess EC at Tracy Boulevard. ***The south Delta EC objectives could be modified to 1,000 uS/cm in all months, to be consistent with the drinking water EC objective***. Because the EC at Vernalis controls the south Delta EC, ***the Vernalis EC objective could be modified to 950 uS/cm in all months, to protect all beneficial uses along the SJR and in the south Delta channels***, while allowing some increase in EC from agricultural drainage, groundwater accretions, and wastewater discharges (Emphasis added).

This quoted language clearly states that a relaxation of the current EC objective (which is 0.7/1.0 uS/cm) to a year round 1000 uS/cm (or 950 uS/cm) will protect all agricultural beneficial uses along the SJR and in the south Delta channels. However, the Report includes no evaluation of the science behind either the current objectives or the proposed changes to the objectives contained in the SED. Neither does it evaluate if the drinking water standard for salinity has any relationship to what is needed to protect agricultural beneficial uses. The issue of what the EC of

the applied water is necessary to protect agricultural beneficial uses in not even a issue addressed by the Report, as of course it could not be as the SED and Report were developed at the very same time. Although the Report mentions the Hoffman report upon which the SED relies, neither it or the summary of the Report takes note of the critical flaws in the Hoffman report raised by SDWA and previously presented to ICF by SDWA. The summary of the Report does not qualify any of the statements in its final paragraph as being hypothetical by stating something like "if the SWRCB relaxes the standards …"

As can be seen in the attached, the authors of the Report include Ms. Anne Huber of ICF. As can be seen from the above-referenced citation to the SED, Ms. Huber is also a contributing author of the SED and has appeared with SWRCB staff at workshops/meetings considering the proposals in the SED. Hence Ms. Huber is both advocating to relax the salinity objectives while advising the SWRCB on potential changes to the objectives.[1]

Regardless of the conscious or subconscious intent of ICF employees or of the SWRCB staff, we clearly have ICF taking an (unsupported) advocacy position on southern Delta salinity objectives at the very same time they are purportedly acting as an unbiased consultant to the SWRCB on the appropriateness of those very same objectives. This is not a potential conflict of interest or bias but is in fact a direct and obvious conflict of interest and biased.

Given this, the SWRCB must take action to cure this mistake such as by rescinding the SED as it applies to the southern Delta salinity objectives and start the process anew with a new, unbiased consultant. If not, the final document, whatever it may conclude will be tainted and likely not withstand review by the courts.

I note that ICF is also the consultant to DWR and USBR on the WaterFix which should raise serious questions with the Board. Without delving too far into that process, you might recall a DWR witness in the WaterFix hearings who responded to a cross-examination question by stating that ICF had built an "ethical" wall to preclude conflicts between its representation

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[1] Mr. Russ Brown's name also appears on both documents. I have contacted Mr. Brown about the basis for the statements in the summary of the Report. Based on our conversations, he does not believe the above quoted statements are advocating changes to the south Delta salinity objectives. It does not appear he prepared the summary, but he stated that the intent of the above quoted statements was that salinity objectives at Vernalis and in the south Delta should take into consideration degradation of the water as it travels from Vernalis into the Delta.

of DWR and USBR on the WaterFix EIR/S and its work on the Bay-Delta process for the SWRCB. The above brings the existence and effectiveness of any such wall into question.

Very truly yours,

JOHN HERRICK

Enclosure
cc: WaterFix Service list

EVALUATING SOUTH DELTA SALINITY SOURCES and SALINITY REDUCTION ALTERNATIVES

Russ Brown and Anne Huber, ICF International (russell.brown@icfi.com, anne.huber@icfi.com) and Mike Burns, DWR (michael.burns@water.ca.gov)

ABSTRACT

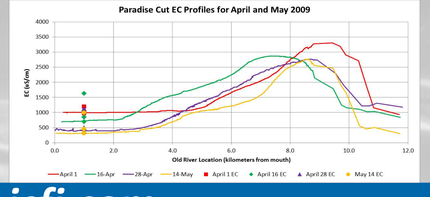
DWR monitoring of salinity (EC) in Old River at Tracy Boulevard has shown many periods when the EC was greater than the EC objectives. The EC objectives for the SJR at Vernalis and in the south Delta (SJR at Brandt Bridge, Old River at Union and Tracy Boulevard) are the same: <700 uS/cm monthly average for April-August, and <1,000 uS/cm monthly average for September-March. Tidal elevation and flow measurements in the south Delta were used to calculate daily net channel flows, the daily EC increments measured along Old River, and the salt loads added to Old River at Tracy Boulevard. The majority of the excess salt loads observed at Tracy Boulevard were determined to originate from Sugar Cut and from Paradise Cut (tidal sloughs). The 15-minute tidal elevation, tidal flow, and tidal EC measurements in the South Delta were summarized in graphical "Data Atlas" documents for 2009-2013. The effects of the temporary barriers on tidal flows, tidal elevation, and tidal salinity patterns were also evaluated. Several alternatives for reducing the measured EC increments in Old River at Tracy Boulevard were investigated and compared.

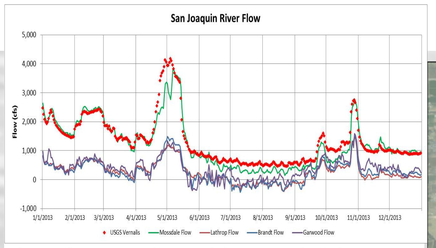
METHODS

Tidal data (15-minute) collected by DWR, USGS, and USBR in the south Delta channels during 2009-2013 were compiled and integrated in annual spreadsheets. The 15-minute data were compared with similar data at several locations along each south Delta channel (SJR, Old River, Middle River, Grant Line Canal, Victoria Canal) to determine the tidal flow and salinity patterns. Data analysis consisted of graphical and statistical summaries of the 15-minute and daily average data, as well as calculations to estimate the tidal flow from the tidal elevations, and a "tidal slough calculator" to estimate the effects of Sugar Cut and Paradise Cut on Old River at Tracy Boulevard EC. The calculator allowed various assumed salt loads and tidal exchange rates to be compared. Daily average and tidal (15-minute data) graphs from the spreadsheets were used to produce "Data Atlas" documents for each year, with brief explanatory text below each graph.

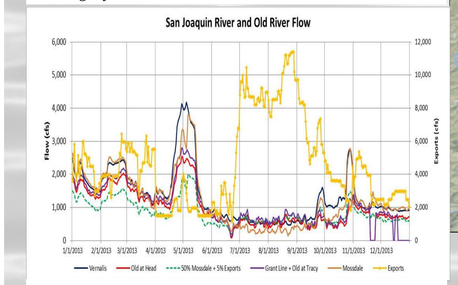
RESULTS

DWR recently (2009) added tidal EC stations in Sugar Cut and Paradise Cut. Sugar Cut is actually connected to Tom Paine Slough just upstream of the Tom Paine Slough diversion barrier with culverts and flap gates; however, for this study, Sugar Cut is used as the name of the tidal slough, and Tom Paine Slough is used as the name of the channel upstream of the barrier with culverts and flap gates. Both Paradise Cut and Tom Paine Slough (Sugar Cut) join Old River just downstream of Doughty Cut, which conveys the majority of Old River flow to Grant Line Canal. The Old River flow downstream of Doughty Cut is only about 10% of the head of Old River flow. The Paradise Cut and the Sugar Cut EC monitoring stations both indicate periods of relatively high EC during low-tide periods, when water from the tidal sloughs is flowing into Old River. Higher EC water from the upstream end of these tidal sloughs appears to be the dominant source for the increased salinity observed at the Old at Tracy EC station. Because the mouths of Paradise Cut and Sugar Cut are downstream of Doughty Cut, the tidal exchange of salt could be the source of higher EC in Old River at Tracy Boulevard. Temporary barriers do not generally change the net flows, but they reduce the tidal flows substantially (<50%) and thereby reduce tidal exchange and flushing in Old River and Middle River upstream of the barriers.

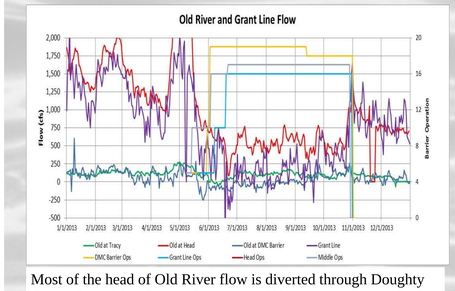




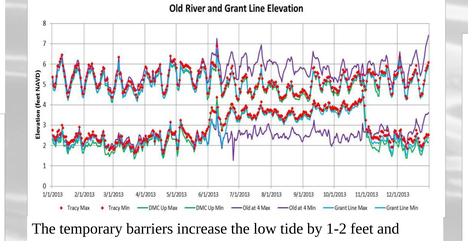
The SJR flows at Vernalis control the SJR EC, the daily average diversions into the head of Old River, and the downstream SJR flows. During low SJR flows, the flows downstream of Old River were slightly reversed in 2013.



The SJR diversion at the head of Old River is about 50% of the SJR flow, and is increased by about 5% of the CVP and SWP pumping.

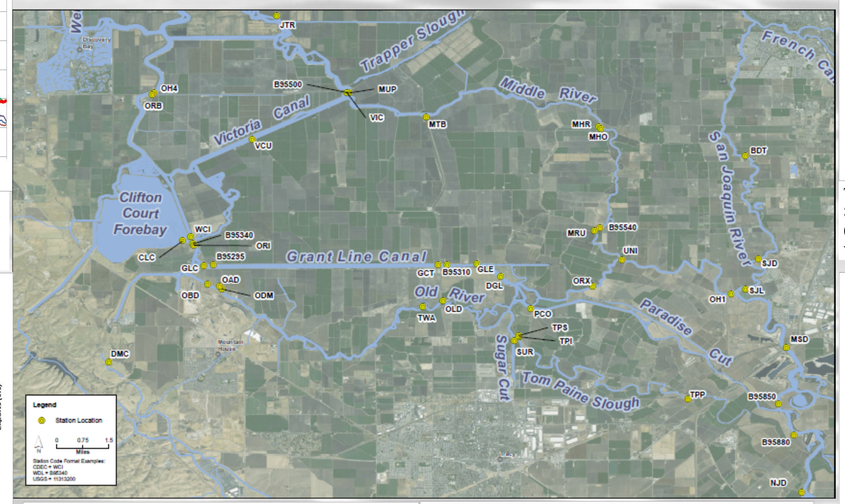


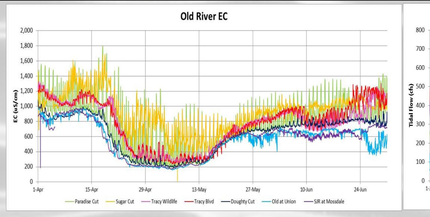
Most of the head of Old River flow is diverted through Doughty Cut to Grant Line Canal. Only about 10% of the flow remains in Old River at Tracy Boulevard.

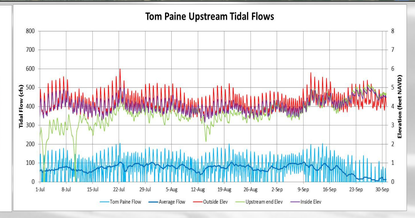


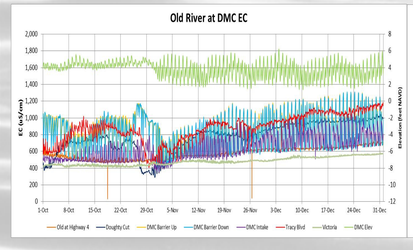
The temporary barriers increase the low tide by 1-2 feet and reduce the high tide by 0.5-1 feet. Without barriers, tidal elevations in the south Delta are nearly identical to those in the SJR at Jersey Point.

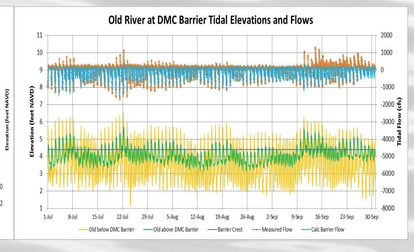
South Delta Tidal Data Atlas Graphs for 2013

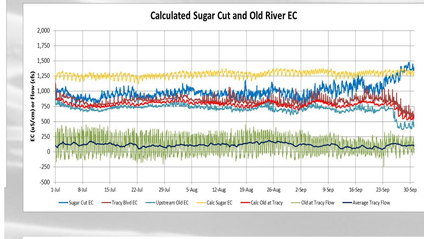


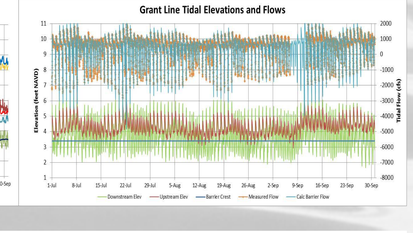




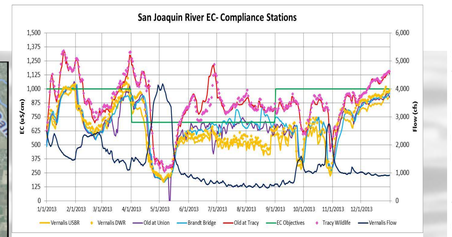




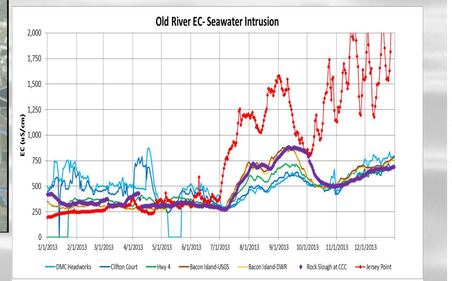




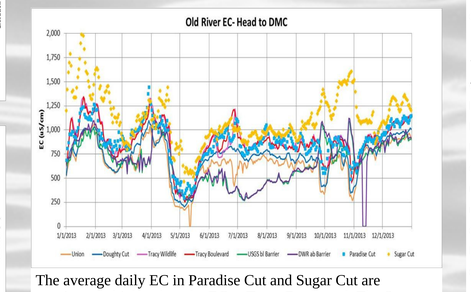
This project was funded by DWR Bay-Delta Office, South Delta Branch. Mark Holderman, Chief.



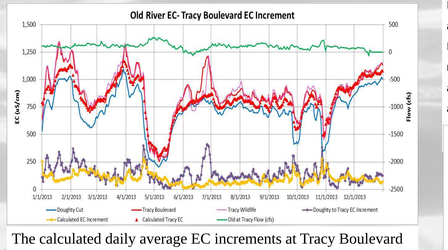
The SJR at Vernalis EC data was always the lowest; the EC in SJR at Brandt Bridge and in Old River at Union were similar (slightly higher); but the EC in Old River at Tracy Boulevard was much higher in 2013.



Seawater intrusion at Jersey Point and at the CCWD Rock Slough and Los Vaqueros intakes and at the CCF and DMC intakes increases during low Delta outflow.



The average daily EC in Paradise Cut and Sugar Cut are consistently higher than the EC at Tracy Boulevard. The Sugar Cut EC was measured upstream of the Tom Paine Slough diversion dam.



The calculated daily average EC increments at Tracy Boulevard from Sugar Cut and Paradise Cut were similar to the measured EC increments in 2013.

Salinity-Reduction Alternatives

Several alternatives for reducing the measured EC increments in Old River at Tracy Boulevard were investigated and compared. Most of the salt load was determined to originate from the upstream ends of Paradise Cut and Sugar Cut. Flushing of Paradise Cut and Sugar Cut with SJR water (10-25 cfs) would not reduce the EC effects at Tracy Boulevard, because the excess salt loads from Paradise Cut and Sugar Cut would not change.

Increase Old River at Tracy Boulevard Flow

The measured Old River at Tracy Boulevard flow is about 10% of the head of Old River flow; most of the flow is diverted through Doughty Cut to Grant Line Canal. Dredging the Old River channel between Doughty Cut and Tracy Boulevard (4 feet deeper; to -8 feet NAVD) could allow more flow to remain in Old River at Tracy Boulevard. If 25% of the flow remained in Old River, the EC increments could be reduced to less than half of the measured EC increments.

Pump High Salinity Water from Sugar Cut and Paradise Cut

Pumping high salinity water from the upstream end of Sugar Cut and Paradise Cut to the SJR or to Old River upstream of Doughty Cut could reduce the EC increments at Tracy Boulevard to less than 10% of measured EC increments, because the excess salt loads would be mixed with the higher SJR flow or with the head of Old River flow. A pipeline to the SJR at the Paradise Cut weir might be used to pump the Paradise Cut water. The City of Tracy wastewater pipeline to the diffuser in Old River (upstream of Doughty Cut) might be used to pump the Sugar Cut water.

Relocate the Mouths of Sugar Cut and Paradise Cut

Relocating the mouth of Paradise Cut and the mouth of Sugar Cut to Old River upstream of Doughty Cut would reduce the Tracy Boulevard EC increments to about 10%, because the net flow in Old River upstream of Doughty Cut is about 10 times the Old River at Tracy flow. The existing mouth of each tidal slough could be blocked with rock barriers or swing-gates, and a new channel could be dredged between Sugar Cut and Paradise Cut (2,000 feet), and an existing channel could be deepened between Paradise Cut and Old River (1,500 feet).

Replace Temporary Barriers with Tidal Gates

The full tidal flows in Old River at the DMC barrier location are about 1,500 cfs with an average tidal flow volume of 500 af (each flood-tide). The temporary barriers reduce these tidal flows to less than half. Installing a tidal gate in Old River at the DMC barrier location could create a strong tidal circulation in Old River, as intended with the South Delta Improvements Program. The tidal gate could open at low-tide to allow the full flood-tide volume of 500 af to move upstream, and then close at high tide to force the ebb-tide flow to move upstream in Old River past Tracy Boulevard to Doughty Cut and then downstream in Grant Line Canal. The excess salt load from Sugar Cut and Paradise Cut during ebb-tide would therefore flow upstream to Doughty Cut and downstream in Grant Line Canal.

Modify the EC Objectives

Based on this tidal flow and EC data analysis, the Vernalis and south Delta EC objectives could be modified to eliminate most periods of excess EC at Tracy Boulevard. The south Delta EC objectives could be modified to 1,000 uS/cm in all months, to be consistent with the drinking water EC objective. Because the EC at Vernalis controls the south Delta EC, the Vernalis EC objective could be modified to 950 uS/cm in all months, to protect all beneficial uses along the SJR and in the south Delta channels, while allowing some increase in EC from agricultural drainage, groundwater accretions, and wastewater discharges.