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DWR-1226

BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

HEARING IN THE MATTER OF CALIFORNIA DEPARTMENT OF WATER RESOURCES AND UNITED STATES BUREAU OF RECLAMATION REQUEST FOR A CHANGE IN POINT OF DIVERSION FOR CALIFORNIA WATER FIX	**TESTIMONY OF ERIK REYES**

I, Erik Reyes, do hereby declare:

I. INTRODUCTION

I am an expert in modeling the California Central Valley system as it relates to the State Water Project (SWP) and Central Valley Project (CVP). I am employed by the Department of Water Resources (DWR) as Chief of the Central Valley Modeling Section in DWR's Bay-Delta Office. I received a Bachelor of Science degree in civil engineering from the University of California at Los Angeles. I am a registered Civil Engineer in the State of California. I have over eighteen years of experience in Central Valley water modeling and have spent the last 4 years in my current role as Chief. I am responsible for leading the development, maintenance and application of mathematical models for the California Central Valley system related to the State Water Project and Central Valley Project. A true and correct copy of my statement of qualifications has previously been submitted as Exhibit DWR-27.

This rebuttal testimony provides response to issues raised by Protestants relating to CalSim II modeling. The testimony is organized into three main sections and one technical memorandum identified as Exhibit DWR-1292.

Specifically, I address Exhibit DWR-1143 and cross-exam questions of my Part 2 direct testimony from Mr. Wolk and Mr. Salmon related to modeling assumptions regarding Rio Vista Flow and OMR. A summary of my rebuttal opinions is:

- DWR-1143 summarizes the new and existing water operations criteria for CWF H3+ operational scenario adopted in the July 2017 CWF Certified Final EIR.
- While the modeling assumption of a January through August Rio Vista flow requirement of 3,000 cfs in the CalSim II model for CWF H3+ is inconsistent with the project description, this inconsistency in the model does not significantly affect the model results of the system conditions and project operations and thus does not change the environmental impacts of the project. Nor does it change any of my opinions.
- CWF H3+ provides more positive average OMR flow than does the NAA.

II. Exhibit DWR-1143

DWR-1143 summarizes the water operations criteria for CWF H3+ operational scenario adopted in the July 2017 CWF Certified Final EIR (SWRCB-109, SWRCB-108). It also identifies which of the CWF H3+ criteria are existing requirements for SWP and CVP, and which ones are newly adopted under the CWF Certified Final EIR. Modeling results for CWF H3+ were presented in SWRCB-108, and petitioner's Part 2 testimony.

Key new criteria include:

• North Delta bypass flow requirements which govern the diversions at the proposed north Delta intakes.

• Old and Middle River (OMR) flow requirements in December through June months which control exports at the south Delta pumps.

• Head of Old River Gate operations in October through June months which control the San Joaquin River flow entering the Old River and other south Delta channels.

• Spring Delta outflow requirement in March, April and May, which is over and above the D-1641 Delta outflow requirements (X2 and NDOI). This new outflow requirement allows SWP and CVP to maintain Delta outflow that would occur incidentally with the south Delta pumping restrictions (OMR, SJR i-e) under the 2008/2009 biological opinions (BiOps) during March through May, which is about 330 TAF above the D-1641 requirement.

The adopted CWF H3+ operations criteria summarized in DWR-1143 include a provision (footnote 29) which states that the Old and Middle River flow requirement in January through March and June months, and the operational triggers would be subject to adaptive management, prior to the implementation. It further identifies that the initial range of the requirement would be -1250 to -5000 cfs based on a 14-day running average, and will be informed by the Adaptive Management Program and real time monitoring. This initial range encompasses the OMR flow requirements outlined in DWR-1143.

III. Rio Vista flow criteria in CalSim modeling for CWF H3+

The CalSim modeling for CWF H3+ erroneously assumed a January through August Rio Vista flow requirement of 3,000 cfs. CWF H3+ does not propose such a requirement despite it being assumed in the CalSim model. It is my opinion however that this incorrect model assumption does not affect the model results of the system conditions and project operations and thus does not change the Project's environmental impacts. My opinion is informed by two different analyses of the Rio Vista requirement.

A. FIRST RIO VISTA ANALYSIS

The first is a review of the existing CWF H3+ modeling results which demonstrate the January through August Rio Vista flow requirement controls operations less than 1% of

the time in the entire 82-year simulation period. There are only four months in the entire 82-year simulation period that show Rio Vista flow criteria at least partially controlled operations and only one month where Rio Vista flow criteria completely controlled operations (Table 1). This demonstrates that 99 percent of the time other criteria such as, flood releases, water quality requirements and Delta Outflow requirements required flows at Rio Vista that exceeded the 3,000 cfs requirement.

Month	**Type of Rio Vista Control**
August 1934	Rio Vista & Emmaton
August 1945	Rio Vista & Jersey Point
August 1965	Rio Vista & Jersey Point
July 1995	Rio Vista
The remaining Jan-Aug months (652 months)	None

Table 1- Months when Rio Vista Criteria was Controlling in 82 Year Simulation Period

B. SUMMARY OF SECOND RIO VISTA FLOW ANALYSIS

The second analysis is a sensitivity analysis developed by creating a CalSim model version of CWF H3+ that removed the January through August Rio Vista flow requirement while keeping all other model assumptions the same as CWF H3+ (Exhibits DWR-515 and DWR-1069). The sensitivity analysis shows conclusively that there is very little change to Total Delta Export, North Delta Export, South Delta Export, Delta Outflow, and North of Delta Storage in the major project reservoirs. Average Delta exports and Outflow changed by less than 0.05%. Figures 10-15 of DWR-1292 show end of May and end of September storage exceedance values in the major project reservoirs are nearly identical.

A version of CWF H3+ without the Jan – Aug Rio Vista flow requirement was

developed and compared to the submitted model of CWF H3+. Figure 1 shows that total Delta Exports do not change for the long-term simulation period of 1922 – 2003 and has negligible changes over the various year types. Figure 2 also shows that Delta Outflow does not change over the long-term and has negligible change for the various year types. Other model data outputs such as average North Delta Exports, average South Delta exports, and Storage exceedance at the major project reservoirs are very similar. These outputs are shown in DWR-1292, Figures 3 – 15.

IV. Updated Old and Middle River Flow Requirement Compliance Charts

Updated OMR charts are being provided to clear up confusion about the OMR provided in DWR-1028 and DWR-1069. The OMR compliance charts in DWR-1028 and DWR-1069 showed compliance with OMR standards. In these charts, the standard that was applied in the No Action Alternative (NAA) and the CWF H3+ alternative was not the same standard. The NAA used the BiOps criteria for OMR and the CWF H3+ used the criteria described in Table 1 of DWR-1069. These charts would have been clearer if both alternatives were compared against the BiOps criteria. It is my opinion that the Figures 16 – 24 of DWR-1292 are representative of OMR flows as modeled in NAA and CWF H3+and that CWF H3+ provides more positive OMR flow than does the NAA.

During cross examination, some questions were asked of petitioners about how the NAA and CWF H3+ compared when meeting BiOps OMR criteria. The charts in DWR-1028 and DWR-1069 gave the impression that the NAA generally had more positive OMR compared to CWF H3+. The charts gave that impression because CWF H3+ OMR flow was compared against a more restrictive standard. (Transcript, Volume 05, p. 138:24 – 145:6.)

DWR-1292, figures 16–24 demonstrates that CWF H3+ provides consistently greater (more positive) OMR flow than does the NAA. DWR 1292, Figures 17-23 show the compliance exceedance for both NAA and CWF H3+. CWF H3+ shows equal or greater OMR flow for each month between January through August at every exceedance level.

Figure 24 shows the average OMR flow for each month. In each month Figure 24 demonstrates that CWF H3+ has greater OMR flows than NAA. (DWR-1292, Figure 24.)

Executed on this 9th day of July 2018, in Sacramento, California.

Erik Reyes

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