EXHIBIT SVWU-100

TESTIMONY OF WALTER BOUREZ, P.E.

1. I am a registered civil engineer in the State of California and am employed by the firm of MBK Engineers (MBK). I hold Bachelor of Science and Master of Science degrees in Civil Engineering from California State University, Sacramento.

2. I have over 28 years of experience in water resources engineering and have worked on numerous projects involving the modeling of surface water systems, including many projects involving the operation of CalSim models of state and federal water systems in the Central Valley.

3. A sample of the projects in which I have been involved include: (a) revising CalSim II to better represent the physical characteristics of the Sacramento River, Colusa Basin Drain and Stony Creek; (b) working with the federal Bureau of Reclamation to document aspects of the CalSim II model hydrology; (c) serving as a key developer of the CalSim model's depiction of the San Joaquin River system, including the operations of numerous upstream reservoirs in that system and of all water districts in the San Joaquin River basin; and (d) performing hydrologic modeling analysis to determine potential impacts to river systems tributary to the Sacramento – San Joaquin River Delta and in the Delta from proposed actions and projects including: DWR's Franks Tract Project, San Joaquin River Restoration, Upper San Joaquin River Basin Storage Investigation, Delta-Mendota-Canal Recirculation Study, Sacramento Water Forum EIR, EIR/EIR for serving CVP contracts under Public Law 101-514, Hamilton City Pumping Plan Fish Screen Improvement Project EIR/EIS, DWR's Delta Risk Management Strategy, San Luis Low Point Improvement Project EIS, CVP M&I Water Shortage Policy, water transfers analysis, and numerous other projects.

4. A copy of my resume, which accurately describes my education and experience, is Exhibit SVWU-101.

5. For this hearing, I was asked to prepare exhibits and testimony on the following subjects:
   a. Review of California Water Fix (CWF) boundary analysis (exh. SVWU-109)
   b. Example operation of CVP / SWP with CWF and No Action Alternative (NAA) (exh. SVWU-108)
   c. Report on Review of Bay Delta Conservation Program Modeling (exh. SVWU-102)
   d. Technical Comments on the Bay Delta Conservation Plan/California Water Fix Partially Recirculated Draft EIR/Supplemental Draft EIS (exh. SVWU-103)
   e. Technical Comments on Coordinated Long-Term Operation of the Central Valley Project and State Water Project Draft Environmental Impact Statement (exh. SVWU-104)
   f. California Water Fix Biological Assessment Modeling Review Report (exh. SVWU-107)

Review of CWF Boundary Analysis

6. Exhibit SVWU-109, "Evaluation of California Water Fix Boundary Analysis Modeling", August 31, 2016, is a technical memorandum that describes the MBK review of the Boundary Analysis

Modeling performed in support of the California Water Fix. This review includes six modeling scenarios: CWF No Action Alternative, H3, H4, CPOD Boundary 1 and CPOD Boundary 2, and Alternative 4A.

7. Key findings that are described in detail in Exhibit SVWU-109 are:

    a) Based on our review of the USBR/DWR model files and results, the Boundary Analysis fails in its purported purpose of bounding the range of potential effects of the CWF.
        1) The Boundary Analysis alters Delta outflow requirements and Delta export restrictions that currently apply to the South Delta Diversion (SDD) to create a range of changes in Delta outflow, compared to the NAA. However, the Boundary Analysis does not evaluate a range of potential operations of the Central Valley Project (CVP) and the State Water Project (SWP) with the CWF, or the additional capacity to convey water across the Delta, that would be provided by the North Delta Diversion (NDD), even though this additional conveyance capacity is the primary purpose of the CWF. The Boundary Analysis fails to meet its purported purpose because it does not consider this additional capacity or the flexibility it would provide to the operations of the CVP and SWP.
    b) Four of the key conclusions in MBK's Modeling Review Report, Exhibit SVWU-107, and the evidence supporting those conclusions also apply to the USBR/DWR studies for the Boundary Analysis.
        1) DWR/USBR BA Model does not consider additional capacity that would be made available by the NDD when modeling allocations to South of Delta CVP and SWP contractors.
        2) DWR/USBR BA Model includes artificial limits on the use of Joint Point of Diversion.
        3) DWR/USBR BA Model changes NOD/SOD reservoir balancing criteria so that less stored water is modeled as being conveyed from North of Delta (NOD) reservoirs to San Luis Reservoir during summer months.
        4) CalSim II does not address effects on many types of water users.
    c) The USBR/DWR modeling that was performed is impractical and unsatisfactorily executed.
        1) In each of the Boundary Analysis Alternatives, modeled exports are unrealistically curtailed, modeled allocations are unreasonably suppressed, and modeled water storage remains in North of Delta CVP and SWP reservoirs, and San Luis Reservoir. These modeling results occur despite the increased ability to convey the water through the Delta that would be provided by the CWF and the resulting increased ability to deliver water already in San Luis Reservoir. Given the lack of a true boundary analysis, as described above in 7a), and the listed modeling issues and defects described in above in 7b), the results of the Boundary Analysis are inadequate to draw any accurate conclusions concerning the impacts that CWF actually would have on legal users of water

Example Operation of CVP / SWP with CWF and NAA

8. Exhibit SVWU-108 is a technical memorandum that provides an example of how CWF, and the additional capacity it would create to convey through the Delta water released from storage in Central Valley Project and State Water Project reservoirs upstream of the Delta, have the potential to increase risks of impacts to other legal users of water. A two-year period was analyzed to provide an example of these risks in modeling performed by MBK Engineers.

Review of Bay Delta Conservation Plan Modeling

9. During December 2012 through June 2014, MBK Engineers assisted various parties in evaluating the operations modeling that was performed for the Bay Delta Conservation Plan (BDCP). To assist in understanding BDCP and the potential implications, stakeholders requested that MBK Engineers review the CalSim II modeling studies performed as part of the BDCP (hereafter "BDCP Studies" or "BDCP Model"). The entities who funded this review and report are Contra Costa Water District, East Bay Municipal Utility District, Friant Water Authority, Northern California Water Association, North Delta Water Agency, San Joaquin River Exchange Contractors Water Authority, San Joaquin Tributaries Authority, and Tehama Colusa Canal Authority.

10. An initial review led MBK Engineers to conclude that the BDCP Model, which serves as the basis for the environmental analysis contained in the BDCP Environmental Impact Report/Statement (EIR/S), provides only limited useful information to understand the effects of the BDCP. The BDCP Model contains erroneous assumptions, errors, and outdated tools, which result in impractical or unrealistic Central Valley Project and State Water Project operations. The unrealistic operations, in turn, do not accurately depict the effects of the BDCP.

11. MBK Engineers revised the BDCP Model to depict a more accurate, consistent version of current and future benchmark hydrology so that the effects of the BDCP could be ascertained. The BDCP Model was also revised to depict more realistic CVP and SWP operations upon which to contrast the various BDCP alternatives. MBK made significant efforts to coordinate with and inform the U.S. Bureau of Reclamation (Reclamation) and the California Department of Water Resources (DWR) managers and modelers, and CVP and SWP operators of the Reviewers' modifications, assumptions, and findings. Where appropriate, the MBK also used Reclamation and DWR's guidance and direction to refine the MBK Engineers analysis.

12. The report in Exhibit SVWU-102 summarizes: (a) the MBK Engineers analysis and review of the BDCP Model, publicly released for the BDCP's Draft EIR/S in December 2013, (b) the MBK Engineers updates and corrections made to the BDCP Model, and (c) comparisons between the original BDCP Model and the MBK Engineers Model as revised by MBK Engineers.

13. Key findings that are described in detail in Exhibit SVWU-102, "Report on Review of Bay Delta Conservation Program Modeling" are:

a) Climate change assumptions were incorrectly applied, yielding non-sensible model results.
b) Incorporation of climate change ignores reasonably foreseeable adaptation measures.
c) BDCP's "High Outflow Scenario" is not sufficiently defined for analysis.
d) Simulated operation of BDCP's dual conveyance, coordinating proposed North Delta diversion facilities with existing south Delta diversion facilities, is inconsistent with the project description.
e) The BDCP Model contains numerous coding and data issues that significantly skew the analysis and conflict with actual real-time operational objectives and constraints.
f) San Luis Reservoir operational assumptions produce model results that are inconsistent with real world operations.
g) Delta Cross Channel operational assumptions overestimate October outflow.

Technical Comments on the Bay Delta Conservation Plan/California Water Fix Partially Recirculated Draft EIR/Supplemental Draft EIS

14. MBK Engineers performed a review of the Bay Delta Conservation Plan/California Water Fix Partially Recirculated Draft EIR/Supplemental Draft EIS (RDEIR/SDEIS) and developed a technical memorandum, Exhibit SVWU-103, "Technical Comments on the Bay Delta Conservation Plan/California Water Fix Partially Recirculated Draft EIR/Supplemental Draft EIS," dated: October 28, 2015.

15. The key findings of MBK's review of the RDEIR/SDEIS are: (a) the description of the proposed project is insufficient for analysis; (b) the project description is inconsistent with the RDEIR/SDEIS's analysis; and (c) issues regarding the analysis that MBK previously identified remain unaddressed. Assumptions, errors, and outdated tools used in the analysis for the BDCP Draft EIR/EIS remain in the RDEIR/SDEIS and result in impractical or unrealistic CVP and SWP operations. The use of the analyses from the BDCP Draft EIR/EIS therefore provides only limited useful information about the effects of the proposed California Water Fix project.

Technical Comments on Coordinated Long-Term Operation of the Central Valley Project and State Water Project Draft Environmental Impact Statement

16. MBK Engineers performed a review of Coordinated Long-Term Operation of the Central Valley Project and State Water Project Draft Environmental Impact Statement (LT Ops DEIS) and developed a technical memorandum, Exhibit SVWU-104, "Technical Comments on Coordinated Long-Term Operation of the Central Valley Project and State Water Project Draft Environmental Impact Statement", dated September 29, 2015.

17. A portion of the review of the LT Ops DEIS focused on climate change. This review is applicable to this hearing because the methodology used to develop climate change hydrology in the LT Ops DEIS is the same as that used in analysis for the Bay-Delta Conservation Plan DEIS/EIR and the California Water Fix Revised DEIS/EIR.

18. The key finding regarding climate change is that climate change assumptions result in unrealistic modeled operations of the CVP and SWP. Including climate change, without adaptation measures, produces model results with insufficient water to meet all regulatory objectives and user demands, and results in CalSim II being modeled with operations beyond the usable range of CVP and SWP operations. Climate change hydrology is applied as changes in inflows to reservoirs represented in CalSim II. This ignores changes in operations of large reservoirs upstream of those in CalSim II that should be considered to properly incorporate climate change into CalSim II.

California Water Fix Biological Assessment Modeling Review Report

19. Exhibit SVWU-107 describes MBK Engineers' findings and opinions on the hydrologic modeling that the U.S. Bureau of Reclamation, and the California Department of Water Resources, performed for the January 2016 CWF draft Biological Assessment (BA) under Section 7 of the ESA. This report also describes MBK's independent modeling assessment of CWF operations using the same project-specific assumptions as the CWF BA, but with more appropriate assumptions regarding system-wide water operations

20. We have determined that the modeling submitted by CWF's proponents fails to demonstrate an absence of injury to legal users of water, due to inappropriate assumptions regarding the operation of the CVP and SWP with the addition of the CWF. We have determined that the modeling submitted by CWF's proponents cannot be relied on to demonstrate a lack of injury to other legal users of water, and instead have concluded that the CWF is likely to result in increased risk to other legal users of water.

21. Inappropriate assumptions contained in the modeling performed by DWR and USBR for the CWF Draft BA (DWR/USBR BA Model) result in impractical and unrealistic modeled CVP and SWP operations. Therefore, the DWR/USBR BA Model provides only limited useful information about the actual effects of the CWF, and cannot be relied upon to demonstrate lack of injury to other legal users of water. The primary reason for impractical and unrealistic modeled operations in the DWR/USBR BA Model is that model parameters are set to limit use of the additional capacity that would be made available to the CVP and SWP with CWF by the North Delta Diversion (NDD). The most significant model parameters and resulting effects on CVP/SWP operations are:

    a) DWR/USBR BA Model does not consider the additional capacity that would be made available by the NDD when modeling allocations to South of Delta CVP and SWP contractors.
    b) DWR/USBR BA Model includes artificial limits on the use of Joint Point of Diversion.
    c) DWR/USBR BA Model changes NOD/SOD reservoir balancing criteria so that less stored water is modeled as being conveyed from North of Delta (NOD) reservoirs to San Luis Reservoir during summer months.
    d) CalSim II does not address effects on many types of water users.
    e) DWR/USBR BA Model constrains modeled diversions of excess Delta outflow beyond limits described in the CWF BA.

22. Besides the five key conclusions described above, many modeling improvements were made in the MBK modeling to address important aspects of CVP and SWP operations that will likely be affected by the CWF. These additional modifications affect many aspects of modeled water operations including reservoir storage, river flows, CVP and SWP contract allocations, and system-wide water supply.