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Via electronic mail

Hearing Chair Tam Doduc

Hearing Officer Felicia Marcus

State Water Resources Control Board

Sacramento, CA

Request to take Official Notice of the report of the 2012 Board Panel on Analytical Tools for Evaluating Water Supply, Hydrodynamic and Hydropower Effects

Dear Hearing Chair Doduc and Hearing Officer Marcus

This letter is to request that the State Water Resources Control Board (Board) or WaterFix Change Petition Hearing Chair take Official Notice of the report of the 2012 Board Panel on Analytical Tools for Evaluating Water Supply, Hydrodynamic and Hydropower Effects (Analytical Tools) for reference in the WaterFix Change Petition Hearing, and particularly the recommendations for use of models or model results in Board proceedings.

CCR Title 23 § 648.2 provides as follows:

Official Notice

The Board or presiding officer may take official notice of such facts as may be judicially noticed by the courts of this state. Upon notice to the parties, official notice may also be taken of any generally accepted technical or scientific matter within the Board's field of expertise, provided parties appearing at the hearing shall be informed of the matters to be noticed. The Board or presiding officer shall specify the matters of which official notice is to be taken. Parties shall be given a reasonable opportunity on request to refute officially noticed technical or scientific matters in a manner to be determined by the Board or presiding officer.

Computer model results have been submitted by the Petitioners in part to meet the statutory requirements for a change petition (Water Code § 1701.2 and Title 23 Cal. Code Regs. § 791, § 794, subds. (a)(2), (8) & (9).)

But the submission is complicated by the lack of external peer review and availability of current, detailed documentation of the computer models. The CALSIM II water operations model has apparently only had a technical peer review of one component in 2006, and current, detailed information on testing and calibration of components of any recent CALSIM II model versions, including the BDCP / WaterFix versions, appears to not be publicly available.¹ To the extent there is current, detailed documentation of assumptions used in model components, or embedded parameter settings, it appears to be only internal.² The Petitioners have also withdrawn the CEQA/NEPA model results and modeling originally submitted in support of the petition, including modeling done for the State Water Resources Control Board.³

The newly submitted model results, and the associated model versions, appear to have no external technical review. The documentation of current CalSim II model assumptions and embedded parameter settings, and testing and calibration information for model components, which would have been developed for such a review, appears to also not be publicly available. Petitioners have declined to provide it for the hearing.⁴ Petitioners have also declined to provide answers to direct questions about internally maintained documentation, testing and calibration information for the BDCP / WaterFix model versions,^{5,6} in contradiction of direction by the Board on March 4, 2016 to do so within 7 days.⁷ Given this situation, it would be helpful for the Board to have clear, objective scientific guidelines available for reference on the information needed to support the proposed use of model results in the hearing.

Board's Field of Expertise

The Board's field of expertise includes review of water operations and hydrodynamic model results in Board proceedings, including the CALSIM II water operations model, and the DSM2 hydrodynamic model. The Board staff reviewed results from prior versions of the CALSIM II and DSM2 models in 2015. Dianne Riddle, the Board Environmental Program Manager, commented:

¹ California Water Research, "Request for extension and missing modelling information," letter to Board and WaterFix hearing parties, June 9, 2016, p. 1 and 2.

² Id, p. 1 and 3-4.

³ California Water Research, "CWR Significant Unresolved Issues," letter to Board and WaterFix hearing parties, April 2, 2016, p. 2.

⁴ James Mizell, attorney for Petitioner Department of Water Resources, "CWF - ProtestantExtensionResponse," letter to Board and WaterFix hearing parties, June 3, 2016, footnote 2, p. 2.

⁵ California Water Research, CWR modelling disclosure, letter to Board and WaterFix hearing parties, Feb 4, 2016.

⁶ California Water Research, "Requested further information on CALSIM II model versions, runs, comparisons," letter to Board and WaterFix hearing parties, March 10, 2016.

⁷ Stephan Volker, attorney for Protestants Pacific Coast Federation of Fishermen's Association and Institute for Fisheries Resources, "2016-06-07 PCFFA and IFR response to DWR and Reclam Opp to Reqs for Extension," letter to Board and WaterFix hearing parties, June 7, 2016, p.1-2.

There is a large degree of uncertainty regarding the exact effects of the project due to a number of factors. However, this is not always clear in the RDEIR/EIS. The effects analysis frequently does not follow the guidelines for use of output from physical and biological models. Generally, those issues arise either when a particular analysis fails to distinguish between modeling as a decision support tool versus modeling to establish predictive point values or when the analysis rescales physical model output from a monthly time step to a daily or hourly time step for input to biological models.⁸

However, there is no letter from Board staff reviewing the currently submitted model results, or the adequacy of the information submitted.

2012 Board Scientific Panel on Analytical Tools -- Relevance

In 2012, the Board convened a panel of leading scientists and technical experts, which reviewed existing water supply and hydrodynamic models, and made clear recommendations for use of models and model results in Board proceedings. The panel was titled, "Analytical Tools for Evaluating Water Supply, Hydrodynamic and Hydropower Effects." The panel included Chris Enright from the SWRCB staff, as well as the following scientists and experts: Jay Lund, Jon Burau, John DeGeorge, John Durand, Greg Gartrell, Marianne Guerin, Pete Smith, William Smith, and Mark Stacy.⁹

Although the panel was convened for the purpose of the Bay-Delta Water Quality Control Plan update, the analytical tools for the Change Petition are the same. According to the panel report, the charge for the panel was as follows (p. 1):

The panel's charge from the State Water Board was to synthesize current scientific knowledge regarding:

"Analytical Tools for Evaluating the Water Supply, Hydrodynamic, and Hydropower Effects of the BayDelta Plan – including the CalSim II water supply model, DSM2 and RMA2 hydrodynamic models, Plexus hydropower model, and others as applicable, together with results from applying these models to various scenarios. "

The panel was asked to identify major points that the Board should be considering on this topic.

⁸ State Water Resources Control Board, Comments on the Bay Delta Conservation Plan/California WaterFix Partially Recirculated Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS), Oct, 30, 2015, p. 2. Available at <https://mavensnotebook.com/wp-content/uploads/2015/10/SWRCB-comments-on-WaterFix-30Oct15-final.pdf>

⁹ The panel report is posted on the SWRCB website at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/docs/comments111312/jay_lund.pdf. It is also submitted as an attachment to this letter.

The Petitioners have submitted CalSim II water supply model results and DSM2 hydrodynamic model results in support of the petition. Identifying major points that the Board should be considering on these tools was part of the charge to the panel.

2012 Board Scientific Panel on Analytical Tools – Near Term Recommendations

The relevant sections of the 2012 panel report are the “Near Term Recommendations” starting on page 3. The following are excerpts from recommendations #5 and #6 (p.4-5), emphasis added:

5. Existing hydrodynamics, operations, planning, power, and economics models can provide insights and information, but must be documented and interpreted more thoughtfully and critically for each application.

[...] General documentation and testing should be readily available prior to the use of the model so that 1) the best model is chosen for the stated problem and 2) the model and results are used correctly. [...]

6. Models and model results used in Board proceedings should be better documented and include a discussion of the strengths, weaknesses, and limitations for each application

[...] Documentation of model testing for conditions relevant to the problem gives the model and modelers credibility. Conversely, failure to provide sufficient details on model strengths and weaknesses should be seen as a sign of model weakness.

Model weaknesses can include major differences of results from field data, including an assessment of the causes of these discrepancies. [...] Knowledge of model weaknesses allows for better interpretations of results. [...] Such an assessment is not possible, however, if weaknesses are not revealed, discussed, and documented.

[...] Use of a model outside the limits of tested field conditions (for example, for inflow conditions that have never existed, or with major new physical features beyond calibrated and tested conditions) requires alternative forms of testing and a more cautious interpretation of results. [...]

The panel also made clear and specific recommendations for calibration and testing of the Delta hydrodynamics and water quality models. These were the recommendations (p. 5):

Some Key Aspects in Calibrating and Testing a Delta Hydrodynamics Model

In the testing and calibration of a Delta hydrodynamic and water quality model, the panel suggests several key aspects to examine. These include:

- Matching point observations of Stage, Flow, Salinity (EC) on tidal and tidally averaged (net) basis
- Matching key interior net-flow splits: Sacramento River to Sutter and Steamboat Sloughs; Sacramento River to Delta Cross Channel and Georgianna Slough; San Joaquin River to Old River at Head; San Joaquin River to Old River and Middle River; net flows around Franks Tract; flow between the Sacramento River and San Joaquin through Threemile Slough
- Representing gate/barrier operations: DCC, Suisun Marsh Salinity Control Gate, south Delta barriers, Clifton Court Gates
- Representing Delta Island Consumptive Use
- Representing Delta Exports
- Representing low flow, high flow, and transition periods
- Representing the yearly cycle of salt intrusion and flushing
- Representing spring-neap tidal variation

Request from Hydrodynamics Modelers

The report includes a June 9, 2009 letter from 24 hydrodynamics modelers in Appendix 2, "Improved Modeling Capabilities Needed for the Bay-Delta Planning Effort." The letter details needs for comparison of 2D and 3D model outputs, and states (p.12, emphasis added):

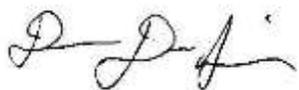
Given the controversial nature of policy-making in the Bay-Delta, these needs must be met with a high level of scientific transparency, proper verification and validation, adequate documentation, and rigorous peer review.

These requirements for proper verification and validation of models have continued to be a major scientific concern since that time, and are an issue in the current proceeding.

Clean Water Act Section 401 Certification

Because the scientific criteria for information used in the hearing for the analysis of water quality impacts may also affect certification of the project under Section 401 of the Clean Water Act, I am forwarding this letter to representatives from the United States Environmental Protection Agency.

Respectfully,



Deirdre Des Jardins
California Water Research

Attachments:
Statement of Service

Report from 2012 scientific panel, "Analytical Tools for Evaluating the Water Supply, Hydrodynamic, and Hydropower Effects of the Bay-Delta Plan"

Cc: WaterFix Hearing Parties

Delta Independent Science Board

Tom Hagler, United States Environmental Protection Agency

Stephanie Gordon, United States Environmental Protection Agency

Valentina Cabrera-Stagno, United States Environmental Protection Agency

**STATEMENT OF SERVICE
CALIFORNIA WATERFIX PETITION HEARING**

Department of Water Resources and U.S. Bureau of Reclamation (Petitioners)

I hereby certify that I have this day submitted to the State Water Resources Control Board and caused a true and correct copy of the following document(s):

Request for Official Notice

To be served by Electronic Mail (email) upon the parties listed in the Current Service List for the California Water Fix Petition Hearing, dated June 9, 2016, posted by the State Water Resources Control Board at

http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/docs/Table1ServiceList06092016com.txt

Note: In the event that any emails to any parties on the Current Service List are undeliverable, you must attempt to effectuate service using another method of service, if necessary, and submit another statement of service that describes any changes to the date and method of service for those parties.

I certify that the foregoing is true and correct and that this document was executed on June 20, 2016.



Deirdre Des Jardins

California Water Research

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