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7 Party to the WaterFix Hearing
8 Principal, California Water Research

9
10 **BEFORE THE**
11 **CALIFORNIA STATE WATER RESOURCES CONTROL BOARD**

12 HEARING IN THE MATTER OF
13 CALIFORNIA DEPARTMENT OF WATER
14 RESOURCES AND UNITED STATES
15 BUREAU OF RECLAMATION
16 REQUEST FOR A CHANGE IN POINT OF
17 DIVERSION FOR CALIFORNIA WATER
18 FIX

19 MOTION TO EXCLUDE SWRCB-3,
20 SWRCB-4, DWR-513 AND DWR-514, OR
21 LIMIT USE IN THE HEARING TO NON-
22 QUANTITATIVE PURPOSES

23 Deirdre Des Jardins, principal at California Water Research (“California Water
24 Research”), hereby moves to exclude Exhibits SWRCB-3 and SWRCB-4, and Exhibit DWR-
25 514, based on the fact that the CalSim model results presented in these exhibits are unsuitable for
26 their proposed use in the hearing, as argued on points and authorities below. Exhibit DWR-513
27 is also based on the CalSim model results. If the exhibits are admitted, California Water
28 Research moves that the model results in Exhibits SWRCB-3 and SWRCB-4, based on the 2010
version of the BDCP/WaterFix CalSim model, and the model results in Exhibit DWR-514 from
the 2015 version of the BDCP/WaterFix CalSim model, should not be used for any quantitative
purposes in the hearing, including Water Code § 1701.3 (b)(1) and (b)(2), and Title 23 Cal.
Code Regs. § 794, based on points and authorities below.

1 The 2013 and 2015 CEQA/NEPA documents (SWRCB-3 and SWRCB-4), were
2 originally proposed to meet the requirements of Title 23 Cal. Code Regs. § 794. The February
3 11, 2016, pre-hearing conference ruling stated in part,

4 During the pre-hearing conference, many parties made persuasive arguments that
5 they cannot participate meaningfully in Part 1 because the draft CEQA document does
6 not contain enough information concerning how the WaterFix will be operated and the
7 potential impacts of the project on other legal users of water. California Code of
8 Regulations, title 23, section 794 contains a detailed list of information that must be
9 provided in a change petition, including effects on other known users of water, and any
10 quantified changes in water quality, quantity, timing of diversion and use, reduction in
11 return flows and other pertinent information. The petitioners' change petition specifies
12 that this information is contained in the CEQA/NEPA documents.

13 However, the written testimony submitted for the Petitioners' case in chief, and the oral
14 testimony in the hearing did not authenticate or validate either the 2010 or 2015 BDCP/WaterFix
15 CalSim models for the proposed use to meet provisions in Title 23 Cal. Code Regs. § 794, which
16 states:

17 § 794. Petition Information and Map Requirements.

18 (a) A petition for change(s) submitted by a permittee or licensee, or
19 submitted pursuant to Water Code Section 1740 by a holder of a water right
20 determined under Water Code Section 2500 et seq. after January 1, 1981 shall
21 identify the amount(s) and holder(s) of the right(s) involved and shall include the
22 following information and map(s):

23 (1) The amount(s) of water which would have been diverted, consumptively
24 used, or stored under the water right in the absence of the proposed change(s),
25 (a) during the period for which the change is requested, or (b) in a maximum
26 year if the change is permanent;

27 (2) The amount(s) of water proposed for change, transfer or exchange;

28 (3) The existing and the proposed purpose(s) of use of water;

(4) The existing and the proposed point(s) of diversion and rediversion, and
the existing and proposed location(s) of any return flow;

(5) The existing and the proposed place(s) of use of the water for various
purposes of use;

(6) The existing and the proposed diversion, release and return flow
schedules if stored water is involved or if the streamflow regime will be
changed;

(7) Any changes in property ownership(s) involved, and the point(s) of
diversion and place(s) of use of other known users of water who may be
affected by the proposed change(s);

(8) Information identifying any effects of the proposed change(s) on fish,
wildlife, and other instream beneficial uses;

(9) Information identifying any effects of the proposed change(s) on other
known users of water, including identification in quantitative terms of any
projected change in water quantity, water quality, timing of diversion or use,

1 consumptive use of the water, reduction in return flows, or reduction in the
2 availability of water within the streams affected by the proposed change(s);
3 (10) The parties involved in the proposed change, transfer or exchange;
4 (11) Map(s) prepared in accordance with Article 7 which describe the
5 proposed change(s), delineate any additional information required by Items (4),
6 (5), and (7) above, and show the hydrologic basin of origin and the streams
7 which could be affected by the proposed change(s).
8 (12) The proposed place(s) of use for irrigation may be listed as net
9 acreage(s) within gross area(s) shown on a map submitted with the petition.

10 In particular, as documented below neither the written or oral testimony, nor the exhibits
11 provided any verifiable evidence that the 2010 version of the BDCP/WaterFix CalSim model
12 used for the model results presented in Exhibits SWRCB-3 and SWRCB-4, or the 2015
13 whatsoever in representing the following sections of Title 23 Cal. Code Regs. § 794, subdivision
14 (a).

15 (1) The amount(s) of water which would have been diverted, consumptively
16 used, or stored under the water right in the absence of the proposed change(s),
17 during the period for which the change is requested, or (b) in a maximum
18 year if the change is permanent;

19 (4) The existing and the proposed point(s) of diversion and rediversion, and
20 the existing and proposed location(s) of any return flow;

21 (6) The existing and the proposed diversion, release and return flow
22 schedules if stored water is involved or if the streamflow regime will be
23 changed;

24 MISLEADING REFERENCES TO PEER REVIEWS

25 The Department of Water Resources' "Master Response To Similar Objections Made By
26 Protestants Collectively," states in part that the CalSim models "... have been subject to various
27 studies and peer reviews. ⁸" (p. 14 at 6) and provides footnotes with hyperlinks to the referenced
28 peer reviews. (p. 14 at 20-23.) Armin Munevar's testimony (Exhibit DWR-71) also stated that

29 CalSim II has been subject to peer review. In 2003, the California Bay Delta
30 Authority Science Program sponsored a peer review panel that issued a report titled, "A
31 Strategic review of CalSim II and its Use for Water planning, Management, and
32 Operations in Central California." (Available at:
33 <http://baydeltaoffice.water.ca.gov/modeling/hydrology/CalSimII/>.) (p. 8 at 1.)

1 The peer reviews were not submitted as an exhibit by the Petitioners, and examination of
2 the peer reviews shows that the references are misleading. The references imply that the 2003
3 peer review somehow validated the model for its proposed use in the WaterFix Hearing. But an
4 examination of the 2003 peer review shows that DWR *never provided the information for a*
5 *technical analysis to the panel.*

6 The 2003 peer review of CalSim II, entitled, *A Strategic Review of CALSIM II and its*
7 *Use for Water Planning, Management, and Operations in Central California*¹ stated in part,

8 The information we received and the shortness of our meetings with modeling staff
9 precluded a thorough technical analysis of CALSIM II. We believe such a technical
10 review should be carried out. Only then will users of CALSIM II have some assurance as
11 to the appropriateness of its assumptions and to the quality (accuracy) of its results. By
12 necessity our review is more strategic. It offers some suggestions for establishing a more
13 complete technical peer review, for managing the CALSIM II applications and for
14 ensuring greater quality control over the model and its input data, and for increasing the
15 quality of the model, the precision of its results, and their documentation. (p. 3)

16 The 2003 review panel also recommended:

17 To increase the public's confidence in the many components and features of CALSIM II,
18 we suggest that these components of CALSIM be subjected to careful technical peer
19 review by appropriate experts and stakeholders. (p. 2)

20 With the exception of the San Joaquin River component of the CALSIM model, the
21 components of the model have not had a technical peer review. The 2006 Peer Review of the
22 San Joaquin River component of the model² stated:

23 CalSim II work fails to adequately report technical results that would give knowledgeable
24 readers some sense of the quality, accuracy, sensitivity, or uncertainty present in the
25 results. This issue was prominent in the previous CalSim review panel report (Close, et
26 al., 2003). (p. 10)

27 ¹ *A Strategic Review of CALSIM II and its Use for Water Planning, Management, and Operations*
28 *in Central California*, " by A. Close, W. M. Haneman, J. W. Labadie, D.P. Loucks, J. R. Lund, D. C.
McKinney, and J. R. Stedinger. CALFED Science Program, 4 Dec. 2003. (Exhibit DDJ-101.) I declare
that this is a true and correct copy of the document.

² David Ford et. al., *Review Panel Report San Joaquin River Valley CalSim II Model Review*, (January
2006) obtained from http://science.calwater.ca.gov/pdf/calsim/calsim_II_final_report_011206.pdf
(Exhibit DDJ-103.) I hereby certify that this is a true and correct copy of the document.

1 The lack of peer review of the CalSim model is significant because Kelly-Frye requires
2 testimony by an impartial expert on general acceptance of the test or technique. (People v.
3 Pizarro (1992) 10 Cal. App. 4th 57, 79-80, 12 Cal. Rptr. 2d 436). The Petitioners have
4 submitted no opinions by impartial experts that validate the proposed use of any version of the
5 CalSim model in the hearing.

6 HISTORIC OPERATIONS STUDY

7
8 Armin Munevar's written testimony (Exhibit DWR-71) relied on the 2003 CalSim
9 Historic Operations Study for validation of the model:

10 DWR completed a quasi-validation of the CALSIM II model in 2003. [...]
11 The CalSim II Simulation Study showed that CalSim II could approximate historic trends
12 suggesting that CALSIM II was a reasonable tool for water resource planning. The
13 CalSim II Simulation Study results that are summarized in Exhibit DWR-514, p.3, Table
14 2 show that simulated SWP Table A and CVP south-of-Delta deliveries during the
15 drought (1987-1992) were within 5 percent of historical values, suggesting a close fit
16 between simulated and actual values. (p. 8)

17 Armin Munevar also stated in the Hearing:

18 There has been an historical validation run
19 that was prepared -- I forget the year, but it was in
20 '87 to '92 or '93 period, I believe -- in which the
21 CalSim inputs were forced to be historic -- direct
22 historic imports and the operation assumptions -- and
23 operation assumptions that were included suggested
24 that -- that results were well within 2 to 3 percent, if
25 I recall correctly. The numbers are in my -- my actual
26 testimony. (Partial Tr. August 23, 2016, 134:9)

1 However, the 2003 Peer Review report noted some issues with the “quasi-validation,”
2 stating:

3 Because the SWP south of delta demands were set to historical deliveries in many years,
4 comparison with the historical deliveries in the validation report is of limited validity.
5 (p. 68)

6 The 2003 Peer Review panel recommended a full calibration and validation of the model:

7 A Calibration/Validation report should be very useful in demonstrating the accuracy of
8 the model. However there are a number of elements in the CALSIM II validation run and
9 the validation report which reduce that confidence including:

- 10 • State Water Project (SWP) demands south of the Delta were set at historical
11 deliveries in years with no restriction and at the contractor’s request level in
12 restricted years. Neither of these pieces of information is available to a
13 production run which calculates demand based on crop areas. Therefore the
14 validation run does not provide reliable information on how well the model
15 can represent these demands.

16 [...]

- 17 • The DWR (2003) report produces estimates of SWP and Central Valley
18 Project (CVP) deliveries south of the Delta but then adjusts them for changes
19 in storage before presenting comparisons of those results with observed
20 deliveries. This process merely checks that the model is preserving a water
21 balance and does not present a legitimate validation of model deliveries.
- 22 • The report provides statistics on long term average deliveries and flows but no
23 statistics on the fit for individual years. Additional analysis of the output
24 would assist stakeholders to assess whether the estimate of water supply
25 reliability and in particular the modeled volumes of water available in the
26 most restricted years are accurate.
- 27 • In some instances, such as the examination of water quality in the Delta, the
28 ability to accurately model monthly flows and deliveries will be important.
The validation report contains no information that would enable the ability to
model monthly flows to be assessed.
- A key model output is the water quality in the Delta. It would assist the
validation of the model if a comparison of parameters such as the location of
the X2 boundary was provided. (p. 31)

 However, new information came out in the hearing that the use of the current CalSim
model for water supply projections is not supported by any validation of the model. The
following is from the August 26, 2016 Hearing transcript (278:12):

12 MS. DES JARDINS: Yeah.
13 Can you close this. And then let's go to
14 "DesJardin," and then go to "Additional Exhibits." And
15 yeah, 121, thank you.
16 And this is what it states. "There are a
17 number of elements in the CalSim II validation report
18 which reduced confidence, including State Water Project
19 demand south of the Delta, were set at historical
20 deliveries with no restriction and at the contractors'
21 request level in restricted years."
22 And then it says, "The validation run does not
23 provide reliable information on how well the model can
24 represent these demands."
25 Let's scroll down a little more.
1 "The report estimates" -- "provides estimates
2 of State Water Project and Central Valley Project
3 deliveries south of the Delta, but then adjusts them
4 for changes in storage before presenting comparisons of
5 those results. This process merely checks that the
6 model is preserving the water balance and does not
7 present a legitimate validation of model deliveries.
8 The report provides statistics on long-term" --
9 CO-HEARING OFFICER DODUC: And your question
10 is?
11 MS. DES JARDINS: Is, so, can you address --
12 can you address -- you had promised in 2004 to do
13 another validation run, and it was addressing these
14 concerns.
15 You know, and you're now saying that you don't
16 believe your peer review panel that it needed to be
17 run, redone?
18 CO-HEARING OFFICER DODUC: So for the record,
19 this is an excerpt from?
20 MS. DES JARDINS: This is an excerpt from the
21 2003 peer review that you've -- that they refer to.
22 This is the peer review, and the peer review did look
23 at the historic validation study.
24 MR. BERLINER: I'm going object on the grounds
25 that this is asked and answered. Mr. Reyes already
280
1 testified that they've updated the water delivery
2 capabilities of the model. It's just rehashing the
3 same question.

1 4 MS. DES JARDINS: But it's never been
2 5 revalidated. And the peer review panel did recommend
3 6 it.
4 7 I'm just saying, you know, why are you
5 8 ignoring the recommendations? It's something that you
6 9 committed to doing in response to this peer review.
7 10 CO-HEARING OFFICER DODUC: Mr. Reyes --
8 11 Let Mr. Reyes answer, for the record, please.
9 12 WITNESS REYES: Every two years, the
10 13 Department produces the delivery reliability, or
11 14 delivery capability report is what is called now. And
12 15 that is an estimation of our ability to deliver water.
13 16 And that is sort of our update or validation of recent
14 17 deliveries.

15 No information from the 2015 Delivery Reliability Report was submitted for the
16 Hearing Record.

17 LACK OF INFORMATION ON HYDROLOGIC PROCESSES

18 Questioning in the hearing also showed that there was a lack of relevant
19 information provided in the hearing on the CalSim model's representation of hydrologic
20 processes. The following is from the August 26, 2016 Hearing Transcript (259:24).

21 24 MS. DES JARDINS: Respectfully, this goes to
22 25 the fundamental issue of whether the model can be
23 1 calibrated and whether the errors in the model can be
24 2 documented. And, respectfully, that goes to the issue
25 3 -- this is just one small component, yes, but it's
26 4 something that's easily looked at.
27 5 And that goes into whether we can examine or
28 6 rebut the assertions that this has been adequately
1 7 calibrated because we've -- PCFFA subpoenaed the
2 8 calibration for this. And DWR refused to provide it.
3 9 CO-HEARING OFFICER DODUC: Mr. Mizell?
4 10 MR. MIZELL: Let the record reflect that I am
5 11 not aware of any subpoena beginning giving for the data
6 12 that she's referring to. I believe we've responded
7 13 appropriately to all requests for data up to this
8 14 point.
9 15 CO-HEARING OFFICER DODUC: All right. Thank
10 16 you.
11 17 MS. DES JARDINS: I would say there was a

1 18 large set of objections, and almost none of it --
2 19 pretty much none of the calibration data was disclosed.
3 20 And the issue I have here is that what the
4 21 peer review panel said is that, for this model to be
5 22 used in relative mode, it's something that would have
6 23 to be documented rather than merely assumed.
7 24 And I would assert that simply providing your
8 25 calibration information for things like this would
9 1 document it. But I cannot find that calibration data
10 2 anywhere on the Web. And I have not been able to get
11 3 it on request. And, respectfully, you didn't disclose
12 4 a great deal.
13 5 I also requested the calibration data for the
14 6 Sacramento Valley module for the relevant thing, and it
15 7 was because of that error in the Colusa Basin drain.
16 8 So where is that data published?
17 9 Is this really a public model? Are you
18 10 publishing your calibration data anywhere?
19 11 MR. BERLINER: Objection, argumentative.
20 12 CO-HEARING OFFICER DODUC: Just answer to the
21 13 best that you can.
22 14 WITNESS MUNEVAR: Yeah. I think, as we have
23 15 stated before, CalSim is not calibrated, per se. And
24 16 in a -- just a kind of classical sense I think, as
25 17 you're pointing out here, these are the regressions
26 18 that are included in the model, and it's documented
27 19 here.
28 20 MS. DES JARDINS: But this refers to the flow
29 21 results from a 2009 DSM2 recalibration model. You say
30 22 you've looked at it closely. But I can't examine that.
31 23 As a physicist, I work with this all the time. I would
32 24 just like to look at your calibration data and verify
33 25 that this actually represents it.
34 1 And I can't do that if you won't disclose your
35 2 data.
36 3 WITNESS MUNEVAR: The calibration is
37 4 documented in the Draft EIR/EIS. I believe DWR makes
38 5 their DSM2 model ready available as well as their -- I
39 6 don't speak for DWR. Tara, maybe you want to talk
40 7 about where in the DSM2 updates are always posted.
41 8 CO-HEARING OFFICER DODUC: Ms. Des Jardins, I
42 9 think your concerns with respect to the calibration
43 10 with respect to the model, you've made very clear for
44 11 the record, both in your written materials as well as
45 12 in your questioning of these witnesses.
46 13 I don't think they're going to magically whip

1 14 out anything today as a result of your questioning. So
2 15 I would encourage you to move on.

3 16 MS. DES JARDINS: Okay. Thank you.

4 However, the Department of Water Resources' August 1, 2016 "Response to
5 Various Filings of California Water Research" clearly documents that information on the
6 calibration of the current model representations of both the Sacramento Valley Hydrology and
7 flow splits in the Delta, including the Delta Cross Channel, were subpoenaed by PCFFA, and
8 DWR declined to provide them, providing instead links to studies that were 8-10 years old, out
9 of date, and did not include the requested information.

10 In sum, failure by the Petitioners to provide either independent reviews validating the
11 model's simulation of hydrologic processes, or current, relevant information on the calibration of
12 the model's simulation of hydrologic processes as exhibits for the Hearing record is a significant
13 omission. For this reason, the documents using model results should either be excluded from
14 the hearing, or their use in the hearing should be limited.

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16 Respectfully submitted,

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20 Deirdre Des Jardins
21 Principal, California Water Research

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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):

Motion to Exclude SWRCB-3, SWRCB-4, DWR-13, and DWR-14

to be served by **Electronic Mail** (email), in parts due to server limitations, upon the parties listed in Table 1 of the **Current Service List** for the California WaterFix Petition Hearing, dated September 29, 2016, posted by the State Water Resources Control Board at http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/service_list.shtml

I certify that the foregoing is true and correct and that this document was executed on October 6, 2016.

Signature:



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