BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

CALIFORNIA WATERFIX WATER RIGHT CHANGE PETITION HEARING	)))

JOE SERNA, JR. BUILDING

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

COASTAL HEARING ROOM

1001 I STREET

SECOND FLOOR

SACRAMENTO, CALIFORNIA

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Certified Shorthand Reporter

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CALIFORNIA WATER RESOURCES BOARD

Division of Water Rights

Board Members Present:

Tam Doduc, Co-Hearing Officer
Felicia Marcus, Chair & Co-Hearing Officer
Dorene D'Adamo, Board Member

Staff Present:

Diane Riddle, Environmental Program Manager
Dana Heinrich, Senior Staff Attorney
Conny Mitterhofer, Supervising Water Resource Control Engineer
Kyle Ochenduszko, Senior Water Resources Control Engineer

PART I

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INTERESTED PARTIES:

State Water Contractors:

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San Luis & Delta-Mendota Water Authority:

Rebecca R. Akroyd, Esq.

INTERESTED PARTIES (Continued):

The City of Roseville, Sacramento Suburban Water District, San Juan Water District, the City of Folsom, Yuba County Water Agency:

Ryan Bezerra, Esq.

The Sacramento Valley Group:

David Aladjem, Esq.

Sacramento County Water Agency:

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California Sportfishing Protection Alliance (CSPA), California Water Impact Network (C-WIN), and AquAlliance:

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North Delta Water Agency & Member Districts:

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East Bay Municipal Utility District:

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For Brett G. Baker, Local Agencies of the North Delta, Bogle Vineyards/Delta Watershed Landowner Coalition, Diablo Vineyards and Brad Lange/Delta Watershed Landowner Coalition, Stillwater Orchards/Delta Watershed Landowner Coalition, Islands, Inc., SAVE OUR SANDHILL CRANES and Friends of Stone Lakes National Wildlife Refuge, City of Antioch:

Osha Meserve, Esq.

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INTERESTED PARTIES (Continued):

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Central Delta Water Agency, South Delta Water Agency (Delta Agencies), Lafayette Ranch, Heritage Lands Inc., Mark Bachetti Farms and Rudy Mussi Investments L.P.:

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Biggs-West Gridley Water District (BWGWD), Glenn-Colusa Irrigation District (GCID):

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Tehama-Colusa Canal Authority & water service contractors in its service area:

Meredith Nikkel, Esq.

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I N D E X

MAY 5, 2017 - FRIDAY 9:32 A.M.

P R O C E E D I N G S

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CO-HEARING OFFICER DODUC: Good morning, everyone. Welcome back to the California WaterFix water right change petition hearing. Happy Friday to you all.

I am Tam Doduc. And soon to be joining us to my right will be board chair and co-hearing officer Felicia Marcus. To our far right is board member DeeDee D'Adamo. To my left are Dana Heinrich, Conny Mitterhofer and Mr. Ochenduszko -- not here but should be back. Mr. Hunt and Mr. Long are also assisting us today.

Since it's Friday, we'll make the announcement short. Speak into the microphone. Begin by identifying yourself. If you hear an alarm or see us leaving, follow, take the stairs, and meet up in the park.

And the third and most important announcement, Mr. Walter -- William Bourez, who violated the third announcement yesterday, please come up and tell us what is that most important announcement?

MR. BOUREZ: Silence your cell phones and all electronic devices, and don't put it in your pocket because it will trigger the device without you knowing it.

CO-HEARING OFFICER DODUC: Take a moment right now and double-check.

You happen to have been the last one -- and also, Mr. Herrick, those were the three people who last violated that particular announcement.

All right. We are back. And before we turn to Mr. Bezerra to resume his cross-examination of Ms. Parker, are there any housekeeping matters that we need to discuss?

I do expect that we will get through the cross-examination of this panel sometime next week.

And how much time do you anticipate needing for direct of your final panel, Mr. Mizell?

MR. MIZELL: We would appreciate an additional 20 minutes.

CO-HEARING OFFICER DODUC: For two witnesses, correct?

MR. MIZELL: For two witnesses.

CO-HEARING OFFICER DODUC: By a show of hands, how many anticipate cross-examining the final members of Panel 3?

And those with your hands up, an hour?

Okay. So all right. It is possible then, very likely we'll get to Group 7 next week. So please be prepared to have -- I'm looking at you as the

representative Group 7, Mr. Bezerra, but we will expect your witnesses to be available next week.

MR. SALMON: Jonathan Salmon for East Bay MUD. We will have cross-examination for this panel.

CO-HEARING OFFICER DODUC: Yes. We received your e-mail today and have added your name to the queue.

MR. SALMON: Okay. Thank you.

MR. BERLINER: Could we just get an idea as to how long?

CO-HEARING OFFICER DODUC: He can answer.

MR. SALMON: Estimate is 45 minutes.

CO-HEARING OFFICER DODUC: Nothing else?

Then, Mr. Bezerra?

MR. BEZERRA: I do have one question. My rough notes were that we had about 13 hours of cross of this panel when people raised their hands and said how much. I was wondering if the board had kept a total of that so we can feel out what day next week witnesses might be required to appear.

CO-HEARING OFFICER DODUC: I roughly estimate about three days, including yesterday and today. So I'm -- since we have all four days together next week, I guess around Wednesday or Thursday. But don't hold me to it.

MR. BEZERRA: Yeah. That was my guess as

well, Wednesday afternoon, Thursday morning for Group 7 witnesses.

CO-HEARING OFFICER DODUC: Thank you for covering that one area last night with Ms. Parker.

What are the other topics that we will be exploring with Ms. Parker this morning?

MR. BEZERRA: I have six topics.

The first is the relative drawdowns in Folsom storage in Ms. Parker's Table 3.

The second is the minimum Folsom Reservoir storage depicted in Ms. Parker's Table 2.

The third is Ms. Parker's critique of MBK modeling based on project reservoir storage and the assumptions that went into that.

Fourth is Ms. Parker's critique of MBK's application of CalSim allocation rules.

The fifth is Ms. Parker's critique of MBK's application of joint point of diversion.

And sixth is a couple of brief questions about a statement Ms. Parker has regarding reclamation's operations of the WaterFix.

CO-HEARING OFFICER DODUC: Please continue.

MR. BEZERRA: Thank you.

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CROSS-EXAMINATION

MR. BEZERRA: Good morning, Ms. Parker.

WITNESS PARKER: Good morning.

MR. BEZERRA: Preliminarily, if we could pull up Exhibit BKS 100 which is, as we stated yesterday, a copy of DOI-33 errata.

Ms. Parker, can you please refer to page 24 of your testimony. If you need another hard copy, I have one you could have.

WITNESS PARKER: If you can show it on the screen, I can see it.

MR. BEZERRA: Before we dive into the model results, I just want to understand the terminology. Do you see the second highlighted sentence which reads: "If BA modeling is rerun using historical hydrology, there are minimal impacts on Folsom storage from implementation of WaterFix"?

WITNESS PARKER: Yes, I see that.

MR. BEZERRA: When you say when the BA modeling is run using historical hydrology, are you referring to the CalSim modeling in the Q0 current climate scenario?

WITNESS PARKER: Yes.

MR. BEZERRA: And then your testimony

frequently uses the term "NoCC modeling." Is that what we're referring to there?

WITNESS PARKER: Yes. That stands for no climate change.

MR. BEZERRA: If we could please pull up page 22 of Exhibit 100 and Table 3 in Ms. Parker's testimony.

The table is labeled "Folsom Storage Conditions, Max and Minimum Conditions and Drawdown for Operational Year."

And, Ms. Parker, I believe in your testimony and then in your summary yesterday, in this table you identified 1932 as the year you believe Jeff Weaver cherry-picked to show minimal impacts on Folsom Reservoir, correct?

WITNESS PARKER: I don't think Mr. Weaver cherry-picked that to show minimal impacts on Folsom storage. He picked that out to demonstrate what he was depicting as a result of a WaterFix operation. And my rebuttal stated that that was not an appropriate foundation for that criticism.

MR. BEZERRA: Okay. But that is the year you identified as Mr. Weaver cherry-picking, in your words?

WITNESS PARKER: That is the year that he cherry-picked. He presented testimony for a two-year

period, '32 and '33.

MR. BEZERRA: Okay. And then just one preliminary question to make sure we're clear about what the table presents. The column that has the label "BA_NAA" are the no-action alternative modeling from the biological assessment, correct?

WITNESS PARKER: Yes, that is true.

MR. BEZERRA: And that's in the -- which climate change scenario is that in?

WITNESS PARKER: That's in the Q5 hydrology. That is the result that he criticized.

MR. BEZERRA: Okay.

WITNESS PARKER: So directly presenting the results that he criticized.

MR. BEZERRA: And the columns that are labeled "BAH3 Plus," those are the proposed action from biological assessment modeling in the Q5 scenario, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: Now, in that 1932 water year in the no-action alternative, the drawdown of Folsom Reservoir in 544,000 acre feet, correct?

WITNESS PARKER: That is correct.

MR. BEZERRA: And in the with-action scenario, the H3 Plus, the drawdown is 698,000 acre feet, correct?

WITNESS PARKER: That is correct.

MR. BEZERRA: So the relative drawdown -- excuse me. Let me rephrase that.

The proposed action draws Folsom Reservoir down 154,000 acre feet more than the no-action alternative, correct?

WITNESS PARKER: That is correct.

MR. BEZERRA: And you characterize this as an outlier outcome, correct?

WITNESS PARKER: Yes.

MR. BEZERRA: In Table 3, please refer to the line for 1923.

Do you see that line?

WITNESS PARKER: Yes.

MR. BEZERRA: In this table, the drawdown in the no-action alternative is 606,000 acre feet, correct?

WITNESS PARKER: Yes.

MR. BEZERRA: And the drawdown in the proposed action H3 Plus scenario is 753,000 acre feet, correct?

WITNESS PARKER: That's correct.

MR. BEZERRA: So for 1923, the proposed action draws Folsom Reservoir down 147,000 acre feet more than the no-action alternative, correct?

WITNESS PARKER: Yes.

MR. BEZERRA: Okay. In this Table 3, please

refer to the line for 1992.

Do you see that line?

WITNESS PARKER: I do.

MR. BEZERRA: Thank you.

In the no-action alternative, Folsom Reservoir is drawn down 510,000 acre feet in 1992, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: And in the proposed action H3 Plus scenario, Folsom Reservoir is drawn down 615,000 acre feet, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: And in this modeling, 1992 is a critical water year; is that correct?

WITNESS PARKER: I believe so.

MR. BEZERRA: Thank you.

So in the -- the proposed action draws Folsom Reservoir down 105,000 acre feet more than the no-action alternative, correct?

WITNESS PARKER: That is correct.

MR. BEZERRA: Staying on that line for 1993, both the no-action and the proposed action show minimum Folsom Reservoir storage at 90,000 acre feet, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: And that is the lowest possible modeling storage in Folsom Reservoir, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: But the proposed action draws the reservoir down 105,000 acre feet more to reach that result than the no-action alternative, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: Thank you.

I'd now like to shift to Table 2 in your testimony on page 19. And this table is a little bit different depiction of Folsom Reservoir storage in the modeling, correct? This shows each year's minimum storage in the reservoir?

WITNESS PARKER: Yes.

MR. BEZERRA: Thank you.

And, again, the columns labeled "BA_NAA" are the no-action in the Q5 scenario, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: And the columns labeled "BA_H3 Plus" are the biological assessments proposed action in the Q5 climate scenario, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: The columns labeled "NoCC_NA" are the -- represent the results from the biological assessment no-action scenario in the Q0 current climate scenario, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: And the column labeled "NoCC_H3 Plus" are the biological assessment modeling of the proposed action in a Q0 current climate scenario, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: Thank you.

Now, preliminarily, you're aware that the Folsom Reservoir's maximum capacity of storage is 967,000 acre feet, correct?

WITNESS PARKER: Yes.

MR. BEZERRA: So a drawdown of 100,000 acre feet is about 10 percent of the reservoir's total capacity, correct?

WITNESS PARKER: Yes.

MR. BEZERRA: You'll see on page 19 of Exhibit BKS 100, I've highlighted a number of results. Most of them are in yellow, one is in orange, and one is in red. So first I'd like to talk about the yellow highlighted results.

Referring to BA_NAA and BA_H3 columns, in each of the yellow highlighted results, Folsom Reservoir is drawn down at least 100,000 acre feet more in the no-action than in the proposed action, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: And that is six years out of the

82-year period of record, correct?

WITNESS PARKER: I haven't counted how many years you have highlighted, but sure.

MR. BEZERRA: And please take whatever time you need to confirm.

WITNESS PARKER: I see five years highlighted there.

MR. BEZERRA: Okay. And if we could scroll down there, I believe there's one more a little lower.

WITNESS PARKER: Okay.

MR. BEZERRA: Those years are 1923, 1932, 1935, 1936, 1937, and 1981, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: Do you know what water year types those are?

WITNESS PARKER: I could look that up for.

MR. BEZERRA: Okay. That's fine.

Do you know if any of them are critical years?

WITNESS PARKER: Yes.

MR. BEZERRA: Do you know which ones are critical years?

WITNESS PARKER: Oh, could we blow that up again? '32 and -- off the top of my head, I cannot remember specifically which ones were critical or dry, but some of them are drier years, yes.

MR. BEZERRA: Okay. Thank you.

Now I'm going to shift over to the right columns, the ones labeled "NoCC." I've highlighted four of those as reflecting drawdowns of -- reflecting years in which Folsom Reservoir is drawn down at least 100,000 acre feet more in the proposed accumulation than in the no-action.

Do you do you see those years?

WITNESS PARKER: I do.

MR. BEZERRA: Do you see there are four of them?

WITNESS PARKER: Yes.

MR. BEZERRA: And those years are 1931, 1932 -- I'm sorry -- 1935 and 1937, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: Do you know what water year types those are in the Q0 modeling?

WITNESS PARKER: No. You want me to look that up? I do have that information here.

MR. BEZERRA: Sure.

WITNESS PARKER: All right. In the Q0 run, '31 is critical, '32 is dry, '35 is below normal, and so is '37.

MR. BEZERRA: Okay. Thank you.

Scrolling down to 2001 in the BA_NAA and

BA_H3, do you see I've highlighted those results in orange?

WITNESS PARKER: Yes.

MR. BEZERRA: Do you see that in that year, the no-action alternative storage is 358,000 acre feet?

WITNESS PARKER: Yes.

MR. BEZERRA: In the proposed action, H3 Plus storage is 263,000 acre feet?

WITNESS PARKER: Yes.

MR. BEZERRA: So the no-action -- excuse me. The proposed action draws Folsom Reservoir down 95,000 acre feet more than the no-action in 2001?

WITNESS PARKER: Yes.

MR. BEZERRA: Do you know what water year type 2001 is in Q5 modeling?

WITNESS PARKER: I do. It is an above normal year.

MR. BEZERRA: Scrolling back up to 1934 in the NoCC or Q0 modeling, do you know what water year type 1934 is?

WITNESS PARKER: That is a critical year in Q0.

MR. BEZERRA: In the no-action alternatives in the NoCC modeling for 1931, the minimum storage in Folsom Reservoir is 133,000 acre feet, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: And that modeling for the proposed action H3, the reservoir is drawn down to its lowest model level of 90,000 acre feet?

WITNESS PARKER: Correct.

MR. BEZERRA: In that modeling, the proposed action draws Folsom Reservoir down to its model dead pool while the no-action alternative does not, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: Do you consider this reduction in minimum Folsom Reservoir storage in 1934 to be of minimal impact, as you use that phrase in your testimony?

WITNESS PARKER: Can I answer that with something that's not a "yes" or "no"?

CO-HEARING OFFICER DODUC: If it's helpful to us understanding, yes.

WITNESS PARKER: I hope this will be helpful.

So the way that we look at CalSim results is not necessarily in a year-by-year fashion depicting that as a specific operational decision in that specific year, especially for critically dry years where the system has, you know, has entered conditions where different operational decisions, unique operational decisions would be made.

What we like to do with CalSim results is view them as an overall depiction of a particular operating strategy or a particular operating philosophy.

CO-HEARING OFFICER DODUC: Let me interrupt you and say that you actually have explained that yesterday.

WITNESS PARKER: Okay.

CO-HEARING OFFICER DODUC: Yes.

WITNESS PARKER: So I guess the take-home message here is that while indeed some of these years show reduced storages in Folsom, other years show increased storages in Folsom. Taken as a whole over a broad range of system operating conditions, what the exceedance slot of the storages will show is that there are no differences between a no-action condition and a with-project condition. And that is the classic use of a comparative modeling study.

The differences that CalSim might reach in individual years, given in some cases conditions that it has inherited from previous years where it made different decisions or where in a couple of cases there are operating rules that changed slightly between the no-action alternative and the WaterFix that allowed an additional export to happen in one month that caused a reduction in storage, when taken as a whole, the results

of the no-action or the results of the WaterFix alternative are the same on a distribution basis as those of a no-action.

And so while I recognize all of the details that you pulled out about the conditions that are lower, there are other conditions that are higher. And that is a common outcome of planning modeling studies.

CO-HEARING OFFICER DODUC: And regardless of whatever year Mr. Bezerra or other cross-examiners might wish to point to -- and we affirm that you can indeed read the chart like we all can -- would that answer still remain?

WITNESS PARKER: Yes.

MR. BEZERRA: Thank you.

Do you understand that if the operation of California WaterFix resulted in dead pool at Folsom Reservoir, there could be water supply impacts to diverters who divert water out of the reservoir?

WITNESS PARKER: Literally, yes.

MR. BEZERRA: Thank you.

Can I please pull up page 17 of Exhibit BKS 100, page 17 of Ms. Parker's modeling. In particular, the paragraph that starts "Main storage argument."

The third sentence of that paragraph in your

testimony, Ms. Parker reads: "No additional years of dead pool result from implementation of the CWF relative to the no-action."

WITNESS PARKER: Yes.

MR. BEZERRA: Is that your testimony?

WITNESS PARKER: Yes.

MR. BEZERRA: And we just discussed in Table 2, 1934 is shown as the proposed action drawing Folsom Reservoir down to dead pool while the no-action does not, correct?

WITNESS PARKER: So like I explained --

MR. BEZERRA: Just can we confirm that's correct?

WITNESS PARKER: In that year, that is correct.

MR. BEZERRA: Thank you.

WITNESS PARKER: The total number of dead pool instances in the no-action is the same as the total number of dead pool instances in the proposed action.

MR. BEZERRA: Okay. Thank you.

WITNESS PARKER: That is the case. That's the point I was trying to make.

MR. BEZERRA: Thank you.

Moving on, I'd like to discuss your critique of the claim of impact based on storage conditions.

If we could please refer to page 2 in Ms. Parker's testimony.

I think you provided some of this testimony in your summary yesterday, so forgive me if it's a little redundant.

You see page 2, the highlighted sentence, the four plots in Figures 1A, 1B, 1C, 1D show exceedance of reservoir storage results for Trinity, Shasta, Folsom, and Oroville respectively, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: Pull up page 3. Page 3, Trinity storage as an example. If we could scroll down to see the legend.

Okay. So, again, the BA_NAA and BA_H3, those are the no-action alternative and the proposed action in the Q5 scenario, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: And that's from the biological assessment?

WITNESS PARKER: Yes.

MR. BEZERRA: And the NoCC_NA and NoCC_H3 Plus are the biological assessments Q0 current action, current climate scenario, correct?

WITNESS PARKER: Correct.

CO-HEARING OFFICER DODUC: And we have covered

that terminology.

MR. BEZERRA: Yes, and I will -- yeah.

Ms. Parker, on these tables, you don't label how we're measuring exceedance, correct? It's not an end-of-month storage?

WITNESS PARKER: That is all months, but yeah. It's end-of-month storage but they're monthly results so they're all end-of-month.

MR. BEZERRA: So each of these figures, A1 -- excuse me -- 1A, 1B, 1C, and 1D are the end-of-month storage for all of the months of the period of records spread on one exceedance plot, correct?

WITNESS PARKER: Yeah.

MR. BEZERRA: Okay. So at any -- on any given curve, a different month and a different year may appear on the same exceedance line?

WITNESS PARKER: That is true.

MR. BEZERRA: Okay. So just theoretically, for instance, on the 90 percent exceedance line, you might have March of 1931 and September of 1992 on the same exceedance line on these curves, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: So these curves do not show carryover storage, correct?

WITNESS PARKER: There are carryover storages

included in the points on this plot.

MR. BEZERRA: The curves themselves don't compare, say, end of October for all of the years?

WITNESS PARKER: You're right. That wasn't the point.

MR. BEZERRA: I understand. I'm just trying to understand what you're...

And they don't segregate the water years according to water year type explicitly, correct?

WITNESS PARKER: Right. Correct.

MR. BEZERRA: If we could please refer to Figure 1C on page 5 of Ms. Parker's testimony.

This figure depicts all of the end-of-month storage for Folsom Reservoir in the modeling, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: Please refer to the inset there in the bottom left corner. I've added a marking "NoCC" to mark what I want to discuss.

This inset shows the months between the 84 percent exceedance and the 100 percent exceedance, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: So this is dryest 16 percent of months for the entire period of record for Folsom Reservoir storage, correct?

WITNESS PARKER: Correct, with a bit of a caveat. I believe that we do have some lower storage conditions even for wetter water years in some isolated situations.

MR. BEZERRA: Okay. Thank you.

So referring to the green line and the green dash line, those are the lines for petitioner's no climate change scenario, correct?

WITNESS PARKER: That is correct.

MR. BEZERRA: And the portion I marked with NoCC, that is roughly between the 93 percent exceedance and the 99 percent exceedance, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: So that's 6 percent of the exceedance curve?

WITNESS PARKER: Correct.

MR. BEZERRA: So it's roughly 60 months out of the entire exceedance curve?

WITNESS PARKER: Sure.

MR. BEZERRA: And on that inset between the 93 percent exceedance and 99 percent exceedance, that demonstrates that Folsom Reservoir storage is lower with the proposed action than the no-action alternative, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: And that roughly the 99 percent exceedance, the proposed action draws the reservoir down roughly 50,000 acre feet, correct?

WITNESS PARKER: Could you say that one more time? The 99 percent exceedance level...

MR. BEZERRA: The 99 percent exceedance level, halfway between 98 and 100, at roughly that point, the proposed action curve is roughly 50,000 acre feet lower than the no-action alternative, correct?

WITNESS PARKER: Gotcha. Yes.

MR. BEZERRA: And a 99 percent exceedance would be an extremely dry year, correct?

WITNESS PARKER: Yes. Sure. Can I add one thing?

MR. BEZERRA: Sure.

WITNESS PARKER: So I do want to point out that the Q0 runs or the no-climate runs were performed by petitioners at the request, I believe, of Fish and Wildlife Service to do some sensitivity analysis for climate change. I also use those studies because it was convenient to compare to MBK studies which had been done with historical climate input.

My understanding is that it was the Q5 runs, the climate change runs, that were part of the petitioners' case in chief. And those runs were really

the ones that saw scrutiny and a level of QA/QC that produced the -- you know, the proposed action that petitioners were intending to put before the board.

The Q0 run done as more of a sensitivity analysis or a -- there was not, to my understanding, the same level of scrutiny for specific operations. To the extent that that may have resulted in some of these lower storage conditions that appear to be an outcome of the WaterFix was nothing that -- was not part of the petitioners' workload in trying to depict exactly how the WaterFix would operate or the range of conditions of the WaterFix would result in under an historical climate.

So it's a bit of a -- it's not a real depiction of a WaterFix impact because the same level of QA/QC was not applied to the Q0 runs as was applied to Q5 runs. So this is not the petitioners' case.

MR. BEZERRA: But you are presenting this testimony in an attempt to rebut testimony presented previously regarding the potential impact of the California WaterFix, correct?

WITNESS PARKER: Well, I think my point was that the blue lines in these plots are -- as MBK claims or as Group 7 claims, the blue lines in these plots do show storage levels lower than the -- lower than the

storage levels that MBK produces as, like, better.

But the reason for those lower conditions is that the climate -- is that the hydrology in those runs were different. The point being, though, that taken as a whole, if you look at the exceedance, the -- the blue lines do not show a consistent and deliberate reduction in storage conditions as a result of the WaterFix and not at the extremely low storage conditions that you're pulling out.

The Q0 run does, but that's not the petitioners' case in chief. It's a sensitivity run.

MR. BEZERRA: Thank you.

These are part of your testimony, though, correct?

WITNESS PARKER: I -- they are. But my testimony states -- my testimony rebuts the claim of Group 7, that the WaterFix will cause harm to storage conditions.

My analysis is that the WaterFix does not cause harm to storage conditions relative to a no-action condition.

MR. BEZERRA: Can we please pull up page 24 of Ms. Parker's testimony? Scroll down to the "Conclusion" section.

And, Ms. Parker, the highlighted sentence

states: "If BA modeling is rerun using historical hydrology, there are minimal impacts to Folsom storage from implementation of the WaterFix," correct?

WITNESS PARKER: Correct.

MR. BEZERRA: And so the previous discussion you indicated was that the historical without climate change hydrology was not the petitioners' modeling, correct?

WITNESS PARKER: Correct. So I guess I see your point. You're pulling out the 6 percent at the very bottom of the curve as an indication that it would cause an impact. That was not the -- that was not the intent of my rebuttal testimony.

Taken as a whole on the distribution of the -- the conditions relative to what was depicted in petitioners' modeling, using the Q0 hydrology as a point of comparison to what MBK did, I -- I will maintain my conclusion; that the impacts that MBK demonstrated were due to them using historical hydrology. They were able to maintain higher conditions overall by using historical hydrology. And when petitioners use historical hydrology as well, we also result in higher conditions than the BA modeling.

MR. BEZERRA: I don't want to belabor this, but the inset section of Figure 1C of your testimony on

page 5 demonstrates that in the historical hydrology modeling between the 19- -- excuse me -- between 93rd exceedance and the '99 exceedance, this modeling demonstrates that the proposed action would draw Folsom Reservoir down further than the no-action alternative, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: Okay. Thank you.

I want to move on to one of the assumptions that is built into the BA modeling, specifically the San Luis rule curve. So let me provide you a hard copy of the document I'm going to be using to speak from.

The document I just handed you is excerpts -- it's marked as Exhibit BKS 101. It is excerpts of Appendix 5A from the biological assessment. And you can see on the first page it's 5A CalSim II modeling and results.

Are you familiar with this appendix?

WITNESS PARKER: Yes, I am.

MR. BEZERRA: Okay. If we could please refer to the second page of BKS 101, which is page 5A-13 of Appendix 5A. In particular, if we could refer to the first paragraph on the page which begins "Delta exports in CalSim II."

Do you see that, Ms. Parker?

WITNESS PARKER: I do.

MR. BEZERRA: I've highlighted some sections in the exhibit.

The first sentence is: "San Luis rule curve is an input to CalSim II which provides a target storage each month that is dependent on the south of Delta allocation and upstream reservoir storage.

"The rule curve allows CalSim II to emulate judgment on the operators in balancing the north of Delta and south of Delta storage conditions."

Ms. Parker, this text indicates that the selection of San Luis rule curve in any given modeling reflects discretionary choices by the modeler, correct?

Let me pull that back. I think I misstated.

The point of the San Luis is to attempt to emulate in modeling the operator's exercise of discretion, correct?

WITNESS PARKER: Sure.

MR. BEZERRA: Okay. And it attempts to reflect the operator's discretionary action in moving water from north of Delta into San Luis Reservoir water storage, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: And the San Luis rule curve is an input to the CalSim II models selected by a modeler,

correct?

WITNESS PARKER: It's calculated by the model using guide curves that are part of the input data set. The individual rule curves are calculated on a month-to-month basis based on system conditions and anticipated deliveries south of the Delta and...

MR. BEZERRA: Does the modeler have any discretion in selecting what rule curve to apply in modeling?

WITNESS PARKER: The modeler has discretion in how the rule curve is calculated. And they can also influence tables that set maximums and minimums and the shape of the rule curve.

MR. BEZERRA: Okay. So on this page of BKS 101, page 5A-13, the last sentence reads: "In the absence of any other operating criteria controlling the upstream reservoir releases or the Delta exports, different San Luis rule curves can result in differences in upstream reservoir release patterns and Delta exports."

That means that the selection of a different San Luis rule curve can result in different modeled upstream storage, correct?

WITNESS PARKER: Yes.

MR. BEZERRA: Okay. If we could move to, I

think, the fourth page BKS 101, page 5A-25 of the appendix.

Ms. Parker, do you see the heading "5A52 CalSim II Assumptions for the Proposed Action"?

WITNESS PARKER: Yes.

MR. BEZERRA: And this heading means that everything in Section 5A52 of the appendix reflects the modeling assumptions for the proposed action, correct?

WITNESS PARKER: I hope so.

MR. BEZERRA: If we could go to the last page of BKS 101 which is page 5A-30 of the appendix. I'd like to refer to the last paragraph which has the heading "San Luis Operations."

If you could take a minute to review that and just make sure you have an understanding of it.

WITNESS PARKER: Okay.

MR. BEZERRA: This paragraph generally describes how the San Luis rule curve was modified from the modeling of the no-action alternative to the proposed action, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: Okay. And please refer to the sentence that reads: "Additional modifications to the rule curve were included to preserve upstream carryover storage conditions while minimizing south of Delta

shortages in the fall months."

Do you see that sentence?

WITNESS PARKER: I do.

MR. BEZERRA: This sentence means that reclamation actually modified the San Luis rule curve in the proposed action modeling to preserve upstream carryover storage, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: And that was a discretionary decision by the modelers as to what San Luis rule curve to select for the proposed action?

WITNESS PARKER: I did not perform the modeling.

My reading of that statement indicates that modifications to the rule curve logic or modifications to the tables that are parameters used to calculate the rule curve were engineered to change based on different operations strategy that included a WaterFix.

MR. BEZERRA: Okay. And --

WITNESS PARKER: I don't know that it involved -- what was the term you used? Setting the rule curve? This might be a question for the people that actually did the modeling.

And also, my testimony really didn't include rule curve topics. So I -- this is getting a little

beyond the scope of what I had reviewed for my rebuttal testimony.

MR. BEZERRA: Just to confirm the record, your testimony refers extensively to biological assessment modeling results, correct?

WITNESS PARKER: It does. I mean, it refers to specific issues that MBK used in their analysis to claim an impact on north of Delta storage, north of Delta delivery. And to the extent that that includes any aspect of modeling, sure, then -- I am a CalSim modeler, and I know what this stuff is. But I did not specifically criticize their implementation of rule curve logic.

MR. BEZERRA: In your testimony, you present a series of modeling or exceedance plots showing upstream storage.

WITNESS PARKER: Okay. I do.

MR. BEZERRA: And your testimony is that those plots demonstrate that California WaterFix would not impact storage, correct?

WITNESS PARKER: Right.

MR. BEZERRA: And those results are based on biological assessment modeling, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: And is it your testimony you

don't know whether the biological assessment modeling including a San Luis rule curve that is more protective of upstream storage?

WITNESS PARKER: No, that's not my testimony. If we want to get into the specific assumptions used for the WaterFix scenario, it makes sense to me that part of the approach for modeling WaterFix would be modifying the rule curve so that you could depict an appropriate operation in order to not cause different storage conditions upstream in the WaterFix scenario. That makes sense to me.

Is that answering your question? I'm struggling.

MR. BEZERRA: Let me ask a follow-up and maybe it will help me understand.

I think what you just said was, in your opinion as a professional modeler, it would make sense to shift the rule curve from the no-action alternative to the proposed action alternative so that the rule curve in and of itself would protect upstream storage better, correct?

WITNESS PARKER: Well, I would phrase it so that the rule curve would help the model to come up with operations that would depict how we propose to operate the system under a WaterFix alternative.

MR. BEZERRA: And to the best of your knowledge, would there be any requirement that in realtime CVP and SWP operators operate the system consistently with any rule curve selected by the modelers?

WITNESS PARKER: So in reality, CBO does not have a San Luis rule curve. The rule curve is a mechanism within the CalSim model that helps us move water according to an overall water supply reliability perspective that both projects can adhere to.

MR. BEZERRA: Okay.

WITNESS PARKER: There are different -- so the two-sentence sound bite here on CalSim model development goals. We actually are currently in the process of trying to shift CalSim logic completely so that it is instead of being driven by this pull functionality from San Luis pulling water out of the north of Delta to the south of Delta, at least on the CVP side, we are currently engaged in a development effort to portray this more as a push mechanism where project operators, what they literally do at the beginning of a year is they -- they project where they want to end up in Shasta at the end of year, where they want to end up in Trinity and Folsom. And so from a modeling perspective, we could push water out of storage --

CO-HEARING OFFICER DODUC: Go ahead and finish.

WITNESS PARKER: -- not to waste it, but it will be reserved if it can be.

What I'm trying describe here is that the rule curve is a modeling mechanism that helps move water from north to south. We can pull it or we can push it, but, fundamentally, it's a modeling mechanism that is generalized to work over the entire realm of the CalSim landscape dry years, wet years. It's -- it's implemented to be generalized model logic.

And, yes, you would, because we move water differently, under a WaterFix scenario and a no-action scenario, it seems logical that the rule curve logic could change in order to accomplish that.

Again, I'm getting outside --

CO-HEARING OFFICER DODUC: All right. All right. All right. Let me interrupt, Mr. Bezerra. I've given you some leeway in your questioning. And, Ms. Parker, I've actually encouraged you to expand on your answers because I find this topic fascinating. But I need to rein you both back in.

MR. BEZERRA: I understand.

CO-HEARING OFFICER DODUC: Since you've used up one hour, what remaining issues do you have?

MR. BEZERRA: Well, I think I can finish now with the rule curve pretty quickly based on the answers we've received. And then I have questions about her critique of MBK's use of allocation rules.

CO-HEARING OFFICER DODUC: So you have three issues left?

MR. BEZERRA: Yes. I think the last one is quite short.

CO-HEARING OFFICER DODUC: Let's start you off with 30 minutes. I would ask you to be more direct in your questioning. There's no need to reiterate everything that we can actually see.

MR. BEZERRA: Well, there is one point I want to clarify that's a little unclear to me.

These cross-examination exhibits, I mean, I would expect to offer these into evidence, particularly given that they're excerpts of staff exhibits in this case. So part of the, let's say, plotting nature of the cross-examination was to ensure that all this is in the record. If we're going to admit the cross-examination exhibits, I can cut through it a little faster. I just wasn't clear we were going to do that.

CO-HEARING OFFICER DODUC: Are you intending to submit this as part of your cross-examination exhibits?

MR. BEZERRA: Yes.

CO-HEARING OFFICER DODUC: Are there going to be objections to its admissibility?

MR. MIZELL: Well, I can't prejudge all cross-examination exhibits at this point in time. We've not objected to the cross-examination exhibits that were submitted after the cases in chief. And so far I haven't seen anything that would be objectionable, in my opinion.

CO-HEARING OFFICER DODUC: Let's move forward on that assumption. And I will trust that Mr. Mizell, Mr. Berliner, and Ms. Aufdemberge will chime in should they be overcome by the need to object.

MR. BEZERRA: So I think it's one last question on rule curve. On page 5A-30, the last sentence begins "Sensitivity analyses."

Do you see that?

WITNESS PARKER: Yes.

MR. BEZERRA: Are you aware of these other sensitivity analyses?

WITNESS PARKER: I am in a general sense. Can I defer the answer to that question to Mr. Munevar, who actually did perform the modeling?

CO-HEARING OFFICER DODUC: I think we wants to know whether you are aware of them. But if you don't

have --

WITNESS PARKER: I'm aware that they exist. I know little about them.

MR. BEZERRA: That's fine. Moving on to the next subject.

Ms. Parker, if we could refer to page 8 of your testimony. With the heading "Manual Allocations" on this page, between this page and page 13, this is generally your critique of the MBK adjustment to CalSim II rules for south of Delta allocations, correct?

WITNESS PARKER: Yes.

MR. BEZERRA: I'll try to cut through this quickly. Those allocation rules include the water supply index-delivery index, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: And that is generally known as the WSI-DI, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: I'm going to be using that term later, "WSI-DI."

Those allocation rules also include an export estimate, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: Referring back to WSI-DI. On page 9 of your testimony -- I'm sorry -- still on

page 8, there's a sentence: "The CVP allocation has its foundation."

Do you see that?

WITNESS PARKER: Yes.

MR. BEZERRA: And that is generally a summing of the available water resources available to the CVP; is that right?

WITNESS PARKER: Correct.

MR. BEZERRA: Is that the WSI part of WSI?

WITNESS PARKER: The WSI part is comprised of carryover storage, plus forecasted inflow, plus an assessment of water supply that can come from the James Bypass that's available to exchange contractors on the San Joaquin.

MR. BEZERRA: Okay. Do you use some form of foresight in calculating a WSI for any given model year?

WITNESS PARKER: No, because the inflow forecasts that are used in the inflow forecast part of that are actually -- they're precrafted as what the forecasts would have been available for March and in April and in May, so they're updated.

And in March, we use a 90 percent forecast, I think. For April, we use a 75 percent forecast. And for May, we use a 50 percent forecast. So it's actually an assessment of what the forecasted inflow volumes

would have been in those months for the years that CalSim models.

MR. BEZERRA: So let me try --

WITNESS PARKER: So it allowed perfect foresight --

MR. BEZERRA: Let me try to understand.

So the model uses forecasts of available supply in calculating the water supply index, correct?

WITNESS PARKER: Yes. So if I could give you --

MR. BEZERRA: That's fine. I'm trying to cut through this a little more rapidly.

WITNESS PARKER: That's fine.

MR. BEZERRA: Okay. Thank you.

WITNESS PARKER: The model uses forecasts of available water supply, that is correct.

MR. BEZERRA: And that's forecasts of future hydrology?

WITNESS PARKER: Yes.

MR. BEZERRA: Thank you.

Now, how does the delivery index, the DI, relate to the WSI?

WITNESS PARKER: So CalSim uses -- so CalSim, you calculate the water supply index. Think of that on the X axis. And then there's a curve that says given a

particular water supply index, what is the demand index. I've always called it a delivery index, but some people call it demand index. Anyway.

So that's just a number that actually is compromised of a combination of delivery target and carryover storage target.

So you take the WSI on the X axis and following that curve -- and so the curve maxes out at basically what the maximum delivery possibility could be. And the way that the curves are constructed currently, it minimizes out at essentially what our senior project water rights are.

In between those two things, given a certain range of water supply, you pick it out a number on the DI side on the Y axis. That number then translates to a delivery portion and a carryover target portion. It's the delivery portion that ends up becoming the green bar in the chart in the plot that I put in my --

MR. BEZERRA: Okay. The delivery index takes into account constraints on CVP's ability to divert water from the Delta, correct?

WITNESS PARKER: I would say no, it's a pretty general number.

MR. BEZERRA: Okay.

WITNESS PARKER: Where we get into

constraining south of Delta allocations based on export capacity, that's a -- that's a -- that's like the next step in the south of Delta.

MR. BEZERRA: Let me get to that then.

WITNESS PARKER: Okay.

MR. BEZERRA: Is that the export estimate?

WITNESS PARKER: Well, there's two processes.

One is a table that depicts the export capacity relative to a Delta index. That barely gets used anymore because with the advent of RPAs, we now use a table that's called I think -- I'm sorry -- export estimate CVP and export estimate SWP. So we have two different tables that characterize the export capacity.

MR. BEZERRA: Let me stop you there.

So the export estimate includes consideration of constraints on Delta exports resulting from the 2008 and 2009 biological opinions, correct?

WITNESS PARKER: That is correct.

MR. BEZERRA: Now, I'm going to use the phrase "allocation rules" with some questions to try to move this along a little more quickly. And I mean that phrase to include both WSI-DI and the export estimate.

Do you understand that, Ms. Parker?

WITNESS PARKER: I do.

MR. BEZERRA: Okay. In your testimony, you

critique how MBK modified the biological assessments allocation rules, correct?

WITNESS PARKER: I wouldn't say it that way. I criticized their predetermination of allocations in their CalSim runs.

MR. BEZERRA: Okay. Could we pull back up Exhibit BKS 101 which is the excerpts of modeling of Appendix 5A of the biological assessment, in particular, the fourth page, which has No. 5A24 at the bottom?

Ms. Parker, do you see the heading "Allocation Decisions"?

WITNESS PARKER: Yes.

MR. BEZERRA: And this section is the description of the allocation rules used in the biological assessment no-action alternative, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: You see the last two sentences in the paragraph beginning: "The south of Delta SWP delivery"?

WITNESS PARKER: Correct.

MR. BEZERRA: And that sentences refers to water supply parameters and operational constraints?

WITNESS PARKER: Yes.

MR. BEZERRA: Are those water supply parameters and operational constraints the WSI-DI and

the export estimate?

WITNESS PARKER: Yes.

MR. BEZERRA: Okay. And the next sentence refers to the CVP systemwide delivery. It also talks about water supply parameters and operational constraints?

WITNESS PARKER: Yes.

MR. O'BRIEN: And are those items of WSI-DI and the export estimate?

WITNESS PARKER: Yes.

MR. BEZERRA: And there's also a statement "with specific consideration for export constraints." Is that also the export estimate?

WITNESS PARKER: Yes.

MR. BEZERRA: If we could please go to the last page of Exhibit BKS 101, which is page 5A-30 of the biological assessment.

Do you see the heading "Allocation Decisions"?

WITNESS PARKER: Yes. Yes.

MR. BEZERRA: And that is the allocation decisions summary for the proposed action in the biological assessment, correct?

WITNESS PARKER: I don't know where the heading started, but sure.

MR. BEZERRA: We can go back.

WITNESS PARKER: That's fine. I believe you.

MR. BEZERRA: Okay. Thank you.

And under that heading it states: "Consistent with NAA assumptions," correct?

WITNESS PARKER: Correct.

MR. BEZERRA: That means that in the biological assessment modeling, petitioners used the same allocation rules in the no-action alternative as in the proposed action, correct?

WITNESS PARKER: That is correct.

MR. BEZERRA: So, in other words, petitioners did not modify CalSim allocation rules from the Delta to account for the additional Delta diversions and conveyance capacity that California WaterFix would provide, correct?

WITNESS PARKER: They did not use a different WSI-DI. Of that, I'm aware.

MR. BEZERRA: And they did not use a different export estimate, correct?

WITNESS PARKER: I think that's correct. The extent to which that governs south of Delta allocations, I have not reviewed that.

MR. BEZERRA: Okay. Thank you.

Are you aware that petitioners' biological assessment modeling showed that the CVP south of Delta

agricultural contractors would receive less water with the proposed action than in the no-action alternative?

WITNESS PARKER: Yes.

MR. BEZERRA: Is it your opinion that with California WaterFix, reclamation would never allocate more water to the CVP south of Delta agricultural contractors than would be allocated without California WaterFix?

MS. AUFDEMBERGE: Objection. Exceeding the scope of her rebuttal testimony.

CO-HEARING OFFICER DODUC: Sorry. I didn't hear what you said.

MS. AUFDEMBERGE: This is exceeding the scope of her rebuttal testimony.

CO-HEARING OFFICER DODUC: Mr. Bezerra?

MR. BEZERRA: The critique -- her critique of the MBK's modeling is, in part, a critique of how MBK sought to allocate water to south of the Delta via the use of the California WaterFix project. So I believe this is within the scope of her rebuttal.

MS. AUFDEMBERGE: Asking a question about future actual operations?

CO-HEARING OFFICER DODUC: Are you able to answer, Ms. Parker?

WITNESS PARKER: That's not my job. I would

refer you to Mr. Milligan's testimony on specific decisions and processes that he's aware of --

CO-HEARING OFFICER DODUC: All right.

WITNESS PARKER: -- on that.

CO-HEARING OFFICER DODUC: Sustain the objection.

MR. BEZERRA: Thank you.

I'd like to pull up Exhibit BKS 102. I can provide you with a hard copy if you'd like.

Ms. Parker, Exhibit BKS 102 is a copy of Chapter 2 of the December 2016 final EIR/EIS California WaterFix and is entitled "Project Objectives and Purpose and Need." I've highlighted a few items for ease of cross-examination.

Could you please refer to the last page to that exhibit? It's 2-4.

On that page, the sentence that begins at line 11 states in part: "The federal agency purpose of the proposed action is to improve the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants."

Do you know whether this project -- federal agency project purpose was considered when the decision was made not to change the allocation rules in the biological assessment modeling?

WITNESS PARKER: No, I don't know that.

MR. BEZERRA: Okay. Referring to the sentence that begins at line 18 on this page, it reads in part: "Restoring and protecting the ability of the SWP and CVP to deliver up to full contract amounts of CVP project water when hydrologic conditions result in the availability of sufficient water. That is one of the project objectives."

Do you know whether this project objective was considered in deciding not to vary the allocation rules in the biological assessment modeling?

MS. AUFDEMBERGE: Object to this question as it's an incomplete hypothetical. It's -- this sentence is not necessarily talking about stored water. It's -- his inference is that -- that these objectives would be met with movement of stored water, and these sentences don't state that.

CO-HEARING OFFICER DODUC: Mr. Bezerra, please repeat your question.

MR. BEZERRA: Yeah. I'm asking if the witness has knowledge as to whether this project objective was considered in conducting the biological assessment modeling.

CO-HEARING OFFICER DODUC: All right. Overruled.

Please answer.

WITNESS PARKER: I do not know.

MR. BEZERRA: Okay.

WITNESS PARKER: I did not perform the biological assessment modeling.

MR. BEZERRA: Thank you.

Moving on a -- Ms. Parker, I want to talk to you about your critique of MBK's --

CO-HEARING OFFICER DODUC: JPOD?

MR. BEZERRA: JPOD. Thank you. Moving right along hopefully.

Okay. If we could please refer to Exhibit BKS 100, which again is a highlighted version of Ms. Parker's testimony. If we could go to page 15, in particular, Figure 6C.

Ms. Parker, you testified that reclamation permits would not use joint point of diversion as assumed by MBK in the modeling that resulted in the MBK curves in this figure, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: Reclamation could change how they operate joint point of diversion, correct?

WITNESS PARKER: I'm not an operator. I don't really feel qualified to answer that question.

The guidance that I was given in discussions

with our Central Valley operation staff was that the modeling results depicted by MBK are inconsistent with how they operate.

MR. BEZERRA: And when you say they're inconsistent with the ways the CVP operates, you mean the way the CVP operates right now, correct?

WITNESS PARKER: Ron Milligan provided us with feedback that said they are not well served by assuming a capacity of joint point of diversion when they're making allocations in March or May.

MR. BEZERRA: Just to cut through this, again, oftentimes, you are relying on Mr. Milligan's representations of how joint point would work?

WITNESS PARKER: Yes, I am.

MR. BEZERRA: Thank you.

WITNESS LEAHIGH: I'm sorry. I could add something to this conversation as an operator.

MR. BEZERRA: I would object to that given that this would be surprise testimony, but I'm not sure it's rebuttal to anyone's testimony.

CO-HEARING OFFICER DODUC: Hang on. Hang on.

I would like to hear Mr. Leahigh's response.

WITNESS LEAHIGH: This is based on evidence of my rebuttal.

And since joint point of diversion by CVP

would occur at the Banks Pumping Plant, which is a SWP facility, I went into great length in my rebuttal testimony talking about the uncertainty that exists in terms of the water supply that would be available for the SWP to move with its facilities.

And if you recall, one of the examples was late in the spring, there's still a significant amount of uncertainty in terms of how much of the available capacity at the Banks -- at the SWP export's facilities would be used for SWP water.

Because of that uncertainty, we would not be able to give the CVP any guarantees on capacity, even late in the year, in terms of their ability to use joint point of diversion at the state facilities.

MR. BEZERRA: Thank you. I'd like to ask a couple follow-up questions.

Mr. Leahigh, currently, water is diverted to the Banks Pumping Plant directly from the Delta, correct?

WITNESS LEAHIGH: The source of the water for Banks Pumping Plant is diversions from Clifton Court which is in the Delta.

MR. BEZERRA: And diversions into Clifton Court Forebay are currently limited by certain permit requirements, correct?

WITNESS PARKER: That is correct.

MR. BEZERRA: And the California WaterFix would provide an alternate route to convey water from Sacramento River to Clifton Court Forebay, correct?

WITNESS LEAHIGH: We would expect to see some shift of the existing supply that's moved from the South Delta diversion point to the North Delta diversion point, that is correct.

MR. BEZERRA: Let me ask the question again.

Mr. Leahigh, the California WaterFix project would provide an alternate means of conveying water from the Sacramento River to the Clifton Court Forebay, correct?

WITNESS LEAHIGH: Yes, it would, as I just stated.

MR. BEZERRA: And as a result, is it possible that the use of the Banks capacity could change as a result of the implementation of the California WaterFix project?

WITNESS LEAHIGH: No, Banks' capacity is what Banks' capacity is.

MR. BEZERRA: Again, that wasn't my question.

WITNESS LEAHIGH: Are you talking about the physical capacity?

CO-HEARING OFFICER DODUC: He's --

Mr. Leahigh, he's asking about the use of that capacity.

WITNESS LEAHIGH: It could. But as I testified, we have established a practice -- we don't utilize the existing capacity of the facility today. So we have no reason to believe that we would increase that use of that capacity with the California WaterFix.

MR. BEZERRA: And this is based on the CVP policies that you discussed yesterday, correct?

WITNESS LEAHIGH: Based on the SWP policies that I discussed yesterday, correct.

MR. BEZERRA: And you confirmed in your testimony those policies could change, correct?

WITNESS LEAHIGH: Those policies could change, but they would not be the result of the California WaterFix.

MR. BEZERRA: But those policies could change, correct?

WITNESS LEAHIGH: They could change, but they have nothing to do with the California WaterFix.

MR. BEZERRA: Those policies could change, correct?

MR. MIZELL: Objection. Asked and answered.

CO-HEARING OFFICER DODUC: Let's move back to Ms. Parker.

MR. BEZERRA: Okay. Ms. Parker, I want to ask

some questions about the relationship between allocation rules and joint point of diversion.

WITNESS PARKER: Okay.

MR. BEZERRA: In the model, joint point of diversion is used to move water that is allocated to the south of Delta, correct?

WITNESS PARKER: Sure. CalSim uses JPOD in an opportunistic way. Typically, when there's a good reason to move water, when there's excess water in the Delta and there is capacity at Banks or when there's a good reason to release water from storage for additional export that Jones cannot move, we can -- and there's capacity at Banks, we can move JPOD water. It's actually pretty rare right now given -- under current conditions. But with the WaterFix, we do see some increase in the ability to use JPOD capacity.

MR. BEZERRA: So if there is an increase in south of Delta CVP allocations, then is it more likely the model will use JPOD to convey that water?

WITNESS PARKER: That could be one conveyance possibility.

MR. BEZERRA: So south of Delta CVP allocations are a driver of whether CalSim II models the CVP as receiving JPOD diversions, correct?

WITNESS PARKER: It is one determining factor,

yes.

MR. BEZERRA: And you testified earlier -- or we discussed earlier reclamation did not change the allocation rules in the biological assessment modeling from the no-action alternative to the proposed action, correct?

WITNESS PARKER: Correct.

MR. BEZERRA: So in your testimony -- if we could pull up page 14 of Ms. Parker's testimony.

There's a statement regarding MBK's use of JPOD. You said: "To test this theory, petitioners' modeling was rerun using artificially high capacity at Banks to convey JPOD and results for JPOD exports did not change appreciably."

That's your testimony?

WITNESS PARKER: That's correct.

MR. BEZERRA: But the allocation rules to move water to south of Delta in the modeling were not changed, correct?

WITNESS PARKER: That's correct.

MR. BEZERRA: And so in your artificially high-capacity scenario, there was no actual change to the allocation rules that might be a driver of the use of JPOD, correct?

WITNESS PARKER: That is correct.

MR. BEZERRA: Thank you.

And that brings me to the last subject of my cross-examination. So if we could please refer to page 16 of Ms. Parker's testimony.

MR. OCHENDUSZKO: Do you want Ms. Parker's testimony up or BKS 100?

MR. BEZERRA: I'm sorry. BKS 100, my highlighted version of her testimony.

And the last sentence on page 16 -- this is part of your conclusions -- states: "MBK's studies do not represent reclamation's potential operation of the WaterFix," correct?

WITNESS PARKER: That is correct.

MR. BEZERRA: Are you aware that reclamation has prepared no plan for how it would operate the CVP with the California WaterFix?

MS. AUFDEMBERGE: Objection. Exceeds her rebuttal testimony.

CO-HEARING OFFICER DODUC: If this goes back to the proposal of terms and conditions, Mr. Bezerra, we've already been there.

MR. BEZERRA: It's a little different. It's not terms and conditions. It's how reclamation actually expects they would operate.

CO-HEARING OFFICER DODUC: Overruled. There's

a question of whether she's aware.

WITNESS PARKER: The petitioners' modeling -- my understanding is that the petitioners' modeling is a reflection of the intent of the petitioners' case in chief to operate the WaterFix in a manner that does not cause harm to legal users of water.

To that extent, the results of our modeling studies show that. And the results of our modeling studies show that we do not change allocation to north of Delta water uses and that we do not change the overall storage conditions in our facilities north of Delta.

That's what this sentence summarizes. If I use the word "operation" in a context that doesn't resonate with a lawyer, I apologize. What I intended this to convey is that MBK studies which result in lower storage conditions as a result of the WaterFix and which result in lower north of Delta deliveries as a result of the WaterFix do not represent reclamation's intent in operating the WaterFix.

MR. BEZERRA: Okay. Let me -- I have a couple follow-up questions on that. I didn't quite understand that.

Did you just testify that reclamation's intent in conducting the modeling for this project was to

result in no impacts to upstream storage?

WITNESS PARKER: It was my -- I believe what petitioners are claiming is that the WaterFix operation does not show harm to legal users of water.

MR. BEZERRA: And I want to unpack that a little bit. I think you said reclamation's intent in conducting the modeling was to show no impact to upstream storage, but then I think you varied that.

CO-HEARING OFFICER DODUC: Hold on.

WITNESS PARKER: That's synonymous to me as a modeler. If that's not a legal thing, I don't know what to do.

CO-HEARING OFFICER DODUC: Let's not beat this one.

MR. BEZERRA: Yes.

CO-HEARING OFFICER DODUC: My understanding is she believes that the modeling reflects the intent of how reclamation would operate the WaterFix.

MR. BEZERRA: Okay. Are you aware that reclamation and DWR are still negotiating how they would use the capacity provided by the California WaterFix?

WITNESS PARKER: I am actively involved in that process. So, yes, I'm well aware.

MR. BEZERRA: Thank you.

Are you aware that reclamation would not be

required to operate the CVP consistently with any of the modeling operations -- excuse me -- modeling assumptions used in petitioners' modeling?

WITNESS PARKER: I'm not aware of any specifics along those lines.

MR. BEZERRA: Thank you. That completes my cross-examination.

CO-HEARING OFFICER DODUC: Thank you, Mr. Bezerra.

Are there any other questions from Group 7 for Ms. Parker?

With that, we will take a break. I'm sure the court reporter will welcome that. And we will resume at 11:05. In the meantime, would Mr. O'Brien please get set up for your cross-examination.

(Off the record at 10:52 a.m. and back on the record at 11:05 a.m.)

CO-HEARING OFFICER DODUC: All right. It is 11:05. We'll resume with Mr. O'Brien. He has estimated 75 minutes for his cross-examination. So we will take our lunch break upon his conclusion.

Mr. O'Brien, a brief outline, please, of the topics you intend to cover with Mr. Munevar.

MR. O'BRIEN: Yes. I'll first be asking some questions about how Mr. Munevar uses the word "injury"

in his testimony.

I will then ask him about some of the operational assumptions that were used in his modeling and the basis for those assumptions.

I will then walk through his rebuttal testimony regarding MBK's modeling and his assertion that the MBK modeling does not show significant impacts.

CO-HEARING OFFICER DODUC: I'm sorry. What was that?

MR. O'BRIEN: A portion of his rebuttal testimony states that the MBK modeling does not show significant impacts.

Next I'll address that portion of his rebuttal testimony regarding discretionary decisions made by MBK in its modeling, including the San Luis rule curve issue and JPOD issue.

And, finally, just a few questions about modeling results in distressed water supply conditions.

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CROSS-EXAMINATION

MR. O'BRIEN: Good morning, Mr. Munevar.

WITNESS MUNEVAR: Good morning.

MR. O'BRIEN: I'm Kevin O'Brien, representing Sacramento Valley client group, which has been previously identified in this proceeding.

As I indicated, I'd like to start with the term -- two terms, actually, the word "injury," which is used in your rebuttal testimony and also the term "significant impacts."

I guess that my question is: Would you essentially use those terms interchangeably or synonymously?

WITNESS MUNEVAR: I think in my testimony I refer to no change between the no-action and the WaterFix and by determining no change, yes, I do describe it as no injury.

CO-HEARING OFFICER DODUC: You need to move closer to the microphone.

MR. O'BRIEN: So we're clear, no change or no significant impact equals no injury? Is that how you define "injury"?

WITNESS MUNEVAR: Yes.

MR. O'BRIEN: So in your analysis of the question of injury, I take it there is a significance determination; is that fair?

WITNESS MUNEVAR: In my rebuttal testimony, all of the differences between the proposed project and the no-action with MBK's modeling, there were essentially no differences except for in some instances in the critical years, and they were less than

1 percent.

MR. O'BRIEN: I'm really talking at a more conceptual level now.

If in a particular instance there was a reduction in the water supply attributable to Cal WaterFix, my understanding of the way you use the term "injury" is that that reduction, in and of itself, would not constitute injury. It would have to rise to the level of a significant reduction.

Is that a fair summary of your position?

WITNESS MUNEVAR: I know there are level of "significance." And in my testimony, I'm indicating that half a percent and 1 percent in the most critical years is not significant, from my standpoint.

MR. O'BRIEN: So in order for you to reach the conclusion that there has been injury, you need to also reach the conclusion that whatever reduction has occurred reaches the level of significance? Is that how you approach it?

WITNESS MUNEVAR: Again, I didn't set a threshold for significance, but I used my judgment in terms of the changes from no-action to WaterFix.

MR. O'BRIEN: I'm not asking you about a threshold; I'm just asking conceptually. If there is a reduction, that in and of itself doesn't constitute

injury in your mind; what you need is a reduction that reaches some level of significance; is that fair?

WITNESS MUNEVAR: I'm not sure that's what I would state, so if I can try to restate.

Understanding the modeling and limitations in modeling, some small changes may occur. And those I would determine, I would -- from my modeling judgment, I would say those are not significant in terms of reality of implementation. So that's -- I'm not using a threshold of significance, but I'm using my judgment from the modeling.

MR. O'BRIEN: To determine the significance?

WITNESS MUNEVAR: Determine the magnitude of the change, yeah, in my statement of significance or no -- no change.

MR. O'BRIEN: Fair enough.

When you consider the question of injury, is it relevant, in your mind, to consider the hydrology of the particular year that you're looking at in terms of potential injury?

WITNESS MUNEVAR: Yeah. I think it's important to look at the range of conditions that we've simulated, the 80-plus years of range of hydrologic conditions.

MR. O'BRIEN: If, for example, if there was a

reduction in supply in a particular year of say hypothetically 100,000 acre feet, it would important to you to know whether that was a critical year, for example, or an above-normal year in determining whether injury had occurred; is that fair?

WITNESS MUNEVAR: I'm not certain. I think if there's a change in -- in wetter or above-normal years, I would use the same types of analysis, not just the dry and critical.

MR. O'BRIEN: So the hydraulic situation or context isn't a factor that you would consider when you consider the question whether there would be an injury in a particular situation?

WITNESS MUNEVAR: I think -- like I testified, we looked at all ranges of hydrologic conditions, so I did consider all of them and partitioned them into five-year types for ease of analysis.

MR. O'BRIEN: I understand that, but I'm asking a more general question. When you consider, let's say in a particular year -- let's just pick 1991. And your modeling shows a reduction in water supply as a result of the Cal WaterFix, would it be important for you to know whether 1991 was a dry year, a critical year, a normal year, a below-normal year in -- in determining whether in your opinion injury has occurred?

WITNESS MUNEVAR: I think it would be important to know that. I'm not -- again, I'm looking at aggregate across all year types. I would still use the same basis of the full distribution in my assessment and not necessarily one particular year.

MR. O'BRIEN: I understand that. But if we're just focusing on 1991 for purposes of my hypothetical, you would want to know what kind of year that is. Fair enough?

WITNESS MUNEVAR: Sure. From -- sure.

MR. O'BRIEN: Now, we talked a lot over the past few days about the operational philosophies of the State Water Project and the Central Valley Project, and I'm hoping we don't have to rehash all that testimony because there's been quite a bit of it. But I did just want to ask a few questions about that.

Is it fair to say, Mr. Munevar, that you and the petitioners' modeling team relied heavily on the project operators to inform the team as to what the probable operations of the state project and the federal project would be with Cal WaterFix in place?

WITNESS MUNEVAR: There's been extensive coordination to develop the no-action over, you know, the last decade or so to refine the operation under the biological opinions. And then there has been

coordination with operations in terms of how those might change or not change under the WaterFix.

MR. O'BRIEN: And in terms of the assumptions that are built into your modeling about how the State Water Project and the Central Valley Project would be operated with California WaterFix in place, those assumptions really came from the operators; is that a fair statement?

WITNESS MUNEVAR: I think it's a little more complicated than that. It's a bit of a two-way street in that models are developed, operators are reviewing the outcomes of those models and the operational behavior to determine whether that seems adequate from their standpoint in terms of how they operate and that that iteration process between operators and modeling staff is conducted.

MR. O'BRIEN: Fair enough.

Let me ask it this way: If Mr. Leahigh, who is sitting next to you, or Mr. Milligan were to say in relation to a particular set of assumptions in your modeling that that's not how we would operate, would you tend to defer to them on those types of issues?

WITNESS MUNEVAR: Yes, in general.

MR. O'BRIEN: You were here when Mr. Leahigh was cross-examined by Mr. Cooper yesterday, correct?

WITNESS MUNEVAR: I was.

MR. O'BRIEN: Did you hear Mr. Leahigh testify that the current operations of the State Water Project could change in the future under various conditions?

WITNESS MUNEVAR: I did.

MR. O'BRIEN: Is that consistent with your understanding?

WITNESS MUNEVAR: I don't know if I have a different understanding or a -- or even the same understanding. I think it's a fair statement.

MR. O'BRIEN: Now, you mentioned in your rebuttal testimony that the MBK modeling assumes -- I think you used the term "more aggressive" export of upstream storage using the new Cal WaterFix facilities; is that correct?

WITNESS MUNEVAR: That's correct.

MR. O'BRIEN: When you were developing the assumptions in the modeling about future State Water Project and CVP operations, did you consider the possibility that the operational philosophy of the projects could change in the future?

WITNESS MUNEVAR: We considered feedback from the operators.

MR. O'BRIEN: So you did consider that possibility?

WITNESS MUNEVAR: Well, we considered feedback from the operators. I don't know what was in their mind in terms of consideration.

MR. O'BRIEN: Well, let me ask you this: As you were developing those operational assumptions, did you understand that the operations of the state project and the CVP might as well change in the future?

WITNESS MUNEVAR: Just to be clear, when you say "in the future," you mean under the WaterFix or in the future without the WaterFix?

MR. O'BRIEN: In the future with the WaterFix.

WITNESS MUNEVAR: Yes, certainly. We understand when you add a new piece of infrastructure that allows a more flexible operation, that the specific operations might -- there might be more flexibility that's enabled by that new facility which might enable you, for example, to divert more excess water and reduce the amount of stored water being released. Which we certainly envisioned in the beginning of the WaterFix and confirmed with the operational discussion.

MR. O'BRIEN: Given the possibility that operations of the state project and the CVP might change in the future with Cal WaterFix, did you ever consider using a range of operational scenarios in your modeling just to cover the possibility that there might be future

changes in operations?

WITNESS MUNEVAR: Well, I think in part the boundary scenarios provided a range of criteria from which the California WaterFix may be operating in.

MR. O'BRIEN: Did you ever consider the possibility of using a range of operational scenarios in relation to releases of water from storage and the export of that water with Cal WaterFix?

WITNESS MUNEVAR: We did not. We did not see a need to.

MR. O'BRIEN: So you never considered that?

WITNESS MUNEVAR: Through the course of almost 10 years of analysis, there were many iterations that were performed with the WaterFix. So there was consideration and refinement as we moved through what's presented in the EIR/EIS and the -- and the biological assessment.

MR. O'BRIEN: But my question really was whether you ever considered using a range of operational scenarios in relation to the release of stored water and the export of that water with WaterFix in place. Was that considered?

MR. MIZELL: For the clarity of the answer, can Mr. O'Brien clarify whether he's speaking about any modeling done for the broader environmental

documentation effort or modeling for this hearing?

MR. O'BRIEN: I'm talking about in all of the deliberations that you've been personally involved in relating to this project, was that ever considered?

WITNESS MUNEVAR: I cannot say with all the iterations there. We've looked at many iterations along the way. In general, they have been targeted to maintain upstream operational flexibility. So not moving additional stored water if that stored water was going to jeopardize upstream operational flexibility.

MR. O'BRIEN: So as you sit here today, you can't remember ever discussing internally the idea of using a range of operational scenarios relating to the release of stored water?

WITNESS MUNEVAR: I do not recall a specific range around use of stored water.

MR. O'BRIEN: Do you recall any discussion about these assumptions that were made about the release of stored water in relation to approvals that would have to be obtained from federal fisheries agencies for the project? That ever come up?

MR. MIZELL: At this point, I'm going to object. We've let this line of questioning go, but we're now getting well beyond the scope of Mr. Munevar's rebuttal testimony and talking about hypotheticals and

discussions that went on in other permitting processes.

CO-HEARING OFFICER DODUC: Mr. O'Brien?

MR. O'BRIEN: Well, Mr. Munevar's rebuttal testimony, which is 39 pages long, deals extensively with the question of what are appropriate operational assumptions. And I think it's very fair to get down into the details of how those assumptions were developed, and that's what I'm trying to do.

CO-HEARING OFFICER DODUC: Go ahead.

MR. MIZELL: In response to that, I have no problem with Mr. O'Brien questioning Mr. Munevar about the operational assumptions of the modeling presented for this hearing and the thought processes that went into that modeling. Questioning him about modeling that may or may not have been conducted for other processes outside of that, I think goes beyond.

CO-HEARING OFFICER DODUC: All right. Your objection is sustained.

Please focus, Mr. O'Brien. You're questioning a little bit more.

MR. O'BRIEN: I'd like to ask that Mr. Long or Mr. Hunt put up on the screen what we've marked as DB1, which is an excerpt from Mr. Munevar's testimony DWR-86.

If you could take a moment and read the highlighted portion of that.

I just want to make sure I understand what you mean by this particular passage. As I understand it -- and correct me if I'm wrong -- you're saying that even if you assume that MBK got everything right in their molding, including their assumptions about release of stored water, that that modeling doesn't show significant impacts on legal users of water; is that a fair summary?

WITNESS MUNEVAR: Yeah. I think first off, we said we do not agree with MBK's modeling, but even if we were hypothetically to agree with it, which we do not, but in the figures I presented, Figures 1 through -- through 5 in the following testimony, demonstrate that there are no changes in deliveries to -- to the contractors that are mentioned there with the exception of one in critical years for certain contractors. And I think it was less than half a percent or less than 1 percent for sure.

MR. O'BRIEN: If we could pull up Figure 1 from Mr. Munevar's testimony, DWR-86, page 4.

This is one of the figures you reference in your testimony in support of the conclusion that the MBK modeling doesn't show any significant impacts, correct?

WITNESS MUNEVAR: Correct.

MR. O'BRIEN: And I think there's other

figures. This particular figure relates to the CVP settlement contractors. I believe there's other figures for exchange contractors and north of Delta refuge deliveries.

WITNESS MUNEVAR: That is correct.

MR. O'BRIEN: In considering this question of whether the MBK modeling shows significant impacts, did you consider anything other than long-term averages?

WITNESS MUNEVAR: In development of my rebuttal testimony, what I considered were the averages by water year type as presented here in Figure 1.

MR. O'BRIEN: Did you consider anything else?

WITNESS MUNEVAR: I did not look at individual years or probability plots for this particular testimony.

MR. O'BRIEN: Mr. Munevar, as a general proposition as an expert in hydrology, is it fair to say that there are times where long-term averages may not tell the whole story in terms of what's happening hydrologically in a particular case?

WITNESS MUNEVAR: I think that's fair if using long-term averages. I think what we've shown here on water year types, these are averages by year types. So they're not necessarily long-term averages across 82 years.

MR. O'BRIEN: So you divided them up by water year types, but you still averaged within the water year types, correct?

WITNESS MUNEVAR: Correct.

MR. O'BRIEN: And aren't there some situations where you'd want to -- for example, in a situation where you had a lot of variability in the hydrology from year to year, aren't there situations where beyond the sort of analysis of averages you've done here, you'd want to look at year-to-year variability just to make sure that the variability wasn't masking -- sorry -- that the use of averages wasn't masking the variability?

WITNESS MUNEVAR: Again, generally, we look at the distribution of the outcomes. So looking at year types is reasonable. Looking at a probability distribution would be reasonable. But we're not looking at necessarily an individual year to make an assessment.

MR. O'BRIEN: Now, your testimony, your rebuttal testimony, refers to a two-year example that MBK undertook in their modeling. Do you recall that?

WITNESS MUNEVAR: Yes, I do.

MR. O'BRIEN: And that example showed a wet year 1993 followed by a critical year 1994, and they modeled the impacts of WaterFix using their modeling with those two years in mind; is that a fair summary.

WITNESS MUNEVAR: That was done in -- directly to rebut testimony from MBK. That is not the approach we would -- we would take for depicting impact.

MR. O'BRIEN: I understand. But for purposes of this part of your testimony, we're assuming that MBK did its modeling correctly, right?

WITNESS MUNEVAR: I don't think we made any assumption whether they modeled it correctly. We merely tried to replicate the two-year period that he used to demonstrate the impact or the change in storage conditions. And to depict that, it was their assumption largely on use of joint point of diversion that caused that storage impact and not the WaterFix.

MR. O'BRIEN: Did you ever perform a similar wet-to-critical analysis in your modeling?

WITNESS MUNEVAR: I don't believe so.

MR. O'BRIEN: Let me caveat that. We do simulate 83 years. So certainly within that 83-year hydrologic sequence, there are wet to critical and there are critical to wet and all the combinations therein.

And we do analyze the behavior of the modeling across those year types, but we've not done a two-year depiction like -- like what MBK has done.

If we could pull up DB3, which is an excerpt from SBU-108, page 9.

This is a conclusion paragraph from the MBK report where this two-year analysis was performed.

My question to you, Mr. Munevar, is: In the context of critical conditions such as occurred in 1994, do you have an opinion as to whether a decrease of water in north of Delta storage of 457,000 acre feet would constitute a significant water supply impact?

WITNESS MUNEVAR: I would have to look at what -- what storage levels those -- that decrease started from. At a high storage level, that may not be a substantial decline. At a low storage level, that may be.

MR. O'BRIEN: So you'd have to do more analysis to be able to answer the question of whether that would constitute a significant impact?

WITNESS MUNEVAR: Yes. But this is not my testimony. You're asking about a hypothetical that indicated that, not my determination.

MR. O'BRIEN: I understand it's not your testimony, but you told me earlier that even assuming that all of the MBK modeling was correct, it's your conclusion that their modeling doesn't show significant impacts, right?

WITNESS MUNEVAR: That was based on those Figures 1 through 5 that were in my rebuttal testimony.

CO-HEARING OFFICER DODUC: Mr. O'Brien, let me ask some questions here.

Mr. Munevar, earlier Ms. Parker, in responding to cross-examination several times, testified as to the long-term nature of her analysis in terms of viewing these modeling result and looking from her perspective at impacts over that long range rather than at individual years. And she was fine with that after Mr. Bezerra walked her through some very specific years that show some results in those years.

Would you share that same principle in terms of looking at modeling results? In other words, if Mr. O'Brien were to walk you through individual years with some impacts and asked you whether or not you would consider those as significant impacts, would your answer be consistent with Ms. Parker in terms of looking at things from a broader perspective in determining impacts rather than individual years?

WITNESS MUNEVAR: Yes. I think Ms. Parker perhaps was more eloquent than me in describing that.

CO-HEARING OFFICER DODUC: And me as well.

WITNESS MUNEVAR: And I think using the terminology that I prefer to use as I look at it across the distribution of the hydraulic conditions, and it's that distribution that guides me in an assessment of

whether there's a change so that -- so, yes, it's the long-term changes across that distribution.

CO-HEARING OFFICER DODUC: So, in your testimony when you use terminology such as "no impact" or "no significant impact," it's based on that long-term perspective rather than looking at any individual years or two years in concert?

WITNESS MUNEVAR: That is correct. The distribution of those changes are important to me, not individual year.

CO-HEARING OFFICER DODUC: I hope that means we don't have to go through individual years.

MR. O'BRIEN: I need to make a comment for the record.

CO-HEARING OFFICER DODUC: Please.

MR. O'BRIEN: I make this with respect to the hearing officer. I think it's highly inappropriate to interrupt my cross-examination to ask leading questions of the witness to point that witness in the direction of another witness's testimony in a way that undercuts the point I'm making.

And the point I'm making is that that type of long-term analysis that Ms. Parker discussed is completely inappropriate in the context of a proceeding where injury is the issue.

CO-HEARING OFFICER DODUC: And fair enough, Mr. O'Brien, you made that. And I expect we will hear about that in various closing briefs that will be filed before this board.

And I do apologize if you perceived that as undercutting your cross-examination. I wanted to, hopefully, make the process a little bit more efficient because I understand that that would be, from reading the testimony that he submitted, that that was his testimony. And I expect fully so that you and others will be filing closing briefs arguing that point.

MR. O'BRIEN: Well --

CO-HEARING OFFICER DODUC: I mean, it is a point that is direct to one of the key issues that is before us. And per our previous ruling -- I believe it was in January -- we pointed out that was certainly something that we expect to be argued, detailed, in closing brief.

MR. O'BRIEN: And I appreciate that. And closing briefs are important, but factual records are important too. And part of my job today is to make a factual record.

So I do have some additional questions. And if there are objections -- it sounds like they may be sustained -- but I feel the need to ask these questions

for purposes of the record.

CO-HEARING OFFICER DODUC: So noted.

And since you have been efficient in previous cross-examination, I would expect you to continue that as well.

MR. O'BRIEN: Thank you.

CO-HEARING OFFICER DODUC: Mr. Jackson, are you about to accuse me of double standards again?

MR. JACKSON: I'm going to highlight this as a violation of due process to continue the discussion that we've had in that regard. It's highly --

CO-HEARING OFFICER DODUC: I'm sorry.

What discussion have we had in regard to that?

MR. JACKSON: The last time I got cut off. And you answered the question in the same fashion to get these people out of trouble.

It is not appropriate in a quasi-judicial hearing for the hearing officer to, in the guise of efficiency in a case that we're certainly not going to get to August in this case or July or anything else, we got plenty of time given the schedule -- to cut off attorneys who are trying to exercise the due process rights of their clients.

And I just wanted to indicate that I believe that Mr. O'Brien understated how egregious this was, and

I want to support his motion. I believe it to be a violation of due process. And it would be something that we all might keep in mind in the future.

CO-HEARING OFFICER DODUC: So noted, Mr. Jackson.

Mr. O'Brien?

MR. O'BRIEN: Thank you.

Mr. Munevar, referring back to DB3 which we have on the screen, there's a statement in this MBK document -- if I can find it: "The reduction of upstream storage of 360 TAF, thousand acre feet, in the spring of 1994 of which about 200 TAF, thousand acre feet, would be from the Shasta/Trinity system."

Do you see that?

WITNESS MUNEVAR: I apologize. I don't -- I'm not following you right now. This is MBK DB3; is that correct?

MR. O'BRIEN: Yes.

WITNESS MUNEVAR: Sorry. I'm having trouble seeing the screen.

MR. O'BRIEN: It's about halfway down through that paragraph.

WITNESS MUNEVAR: In the highlighted?

MR. O'BRIEN: Yeah. Starts with the words "The reduction."

WITNESS MUNEVAR: Referring to the 360,000 acre feet?

MR. O'BRIEN: Yes. And in particular the 200,000 acre feet from the Shasta/Trinity system.

WITNESS MUNEVAR: Okay. Yes, I do see it. Sorry. I feel like an old man. Need help from both sides.

MR. O'BRIEN: I understand. It's pretty small print.

My question to you, sir, is whether in the context of the 1994 hydrology you would consider a 200,000 acre feet reduction in the Shasta/Trinity storage to be a significant impact.

WITNESS MUNEVAR: I think similar to my statement before, I would look at the distribution of it. Again, 200,000 acre feet has a very high storage, may not be substantially different, and there may be years of -- subsequent years might be higher by 200,000 acre feet. So I think it's important to look at the distribution of the changes as opposed to an individual year.

MR. O'BRIEN: Would you want to understand how that 200,000 acre feet would affect the Bureau of Reclamation's ability to meet temperature standards set by the BIOP RPA? Would that be a relevant issue in your

analysis of significance?

WITNESS MUNEVAR: That would be -- that would be a consideration in looking at the changes in there in storage conditions of the low end in trying to meet the temperature requirements.

MR. O'BRIEN: So that would be a relevant question?

WITNESS MUNEVAR: Yes, I think so.

MR. O'BRIEN: But you didn't do any of that type of analysis in relation to this MBK 1993, '94 analysis we've been discussing; is that correct?

MR. BERLINER: Objection. Vague as to what type of analysis you're referring to.

MR. O'BRIEN: Fair enough. I'll rephrase.

Did you do a more focused analysis of the specific impacts that would flow from a reduction of 200,000 acre feet storage in the Shasta/Trinity system in a year like 1994?

WITNESS MUNEVAR: No, we did not. In fact, we argued that those storage impacts are likely an artifact of MBK's modeling assumptions in and of themselves, and that when we reverted just one modeling assumption back of the many that we had highlighted, we had a different storage outcome than what MBK reported.

MR. O'BRIEN: But the answer to my question --

WITNESS MUNEVAR: Getting back to your original question, no, we did not do any further analysis of MBK's modeling.

MR. O'BRIEN: Okay. Following up on the hearing officer's question, it's my understanding, based on what you said, that your view of the right way to analyze injury is that you should really look at the long-term hydrology and that individual years are really not important in terms of the analyzing the question of whether injury might result from Cal WaterFix.

MR. BERLINER: Objection. Misstates the witness's testimony.

MR. O'BRIEN: He can correct me if I got it wrong.

WITNESS MUNEVAR: Yeah, I think I will restate that. I think I said I look at the distribution of changes across the full range of hydrology, not a long-term mean change.

MR. O'BRIEN: When you look at that sort of distribution -- this gets back to Ms. Parker's testimony -- when you have reductions that occur, for example, in storage in dry years, it's acceptable from the standpoint of an injury analysis to then allow wetter years to essentially cancel those out? Is that -- is that a reasonable thing to do in the context

of the injury analysis?

WITNESS MUNEVAR: No, that's -- I don't think that's -- that's not what I would state.

MR. O'BRIEN: Okay.

WITNESS MUNEVAR: Again, looking at the distribution, one particular dry year might be compensated by another -- the next year dry year having an improved storage condition.

MR. O'BRIEN: Okay.

WITNESS MUNEVAR: So when we look across the distribution, that one particular dry year that was lower, if it's compensated by another dry year that is higher, then we would argue from the modeling standpoint that that is not a substantial change in the modeling because we know the modeling can simulate one particular year. If -- if I may provide one quick example, I think this is important.

MR. O'BRIEN: Sure.

WITNESS MUNEVAR: In the Delta conditions, for example, if the X2 position were off by 1 kilometer, half a kilometer, or one-tenth of a kilometer, it may trigger a row island standard under one particular scenario, say, the no-action. And within -- in one particular year. And then with the WaterFix, it may be slightly -- it may be .1 kilometer in the other

direction which didn't trigger the Row Island standard.

We would see a difference in that one particular year of operation between the two modelings. But when we got to a broader distribution of the years, we would expect to see that they are averaging out or that there is a balance across those operational behaviors. That's more of a modeling understanding where we know that there can be years that have different criteria that are driving operations.

MR. O'BRIEN: I appreciate that explanation. And I just want to make clear that what you just said, that description, that's really how you analyze injury in this for purposes of this proceeding; is that right.

WITNESS MUNEVAR: That's how I arrived at the statements I made on the very first point in referring to injury to legal users of water.

MR. O'BRIEN: Thank you.

If we could pull up DB4, please.

Actually, I think we can probably skip that one.

Let's skip to. If we could go to the second page of DB4. I'm going to have him read some testimony that starts at the very bottom of that page.

If you could just read the highlighted testimony, Mr. Munevar.

WITNESS MUNEVAR: Okay.

MR. O'BRIEN: In your modeling, under what conditions would allocations to Sacramento River settlement contractors or Feather River settlement contractors be shorted?

WITNESS MUNEVAR: I'm not a contracting expert, but I know in both the settlement contractors and the Feather River settlement contractors, they're based on hydrology indices. So Sacramento/Shasta index for the CVP settlement contractors and a Feather River index for the settlement contractors.

And when they fall below a certain threshold, which I don't have off the top of my head there, it's called a dry year or a drought year, in which case they can be reduced up to 25 percent.

MR. O'BRIEN: But beyond those reductions that are provided for in the contracts, if there were a situation where those contractors, the Sacramento River settlement contractors and the Feather River contractors, were to be shorted over and above what's provided in the contracts, what would have to happen in your modeling? What -- hydrologically, what would have to happen?

WITNESS MUNEVAR: Well, there's two conditions.

First, within the modeling, there is a land use and hydrologic component to it. So they would be provided either 100 percent or 75 percent of their contract unless, through the hydrologic analysis, it indicated that their demands under that particular year, rainfall was higher or something like that, was less than the contract that they would receive. That would indicate that they were not needing or using that full contract.

MR. O'BRIEN: Would the -- and in your modeling, would the reservoirs -- Shasta Reservoir in the case of the Sac River settlement contractors, Oroville in the case of the Feather River contractors -- would they have to reach dead pool before those contractors were shorted in their supplies?

WITNESS MUNEVAR: In general, those would be the times in which the model would show any shorting over and above that 25 percent reduction.

There are instream flows that are within the modeling that have a -- the model operates based on setting a priority for when release water under the most dire conditions and there are instream flows that would -- would be maintained in the modeling even if it meant that there were settlement contractors not receiving full amount. That would only occur when the

reservoir had released -- or had fallen into dead pool storage.

MR. O'BRIEN: Just so I'm clear, would there be any situations where -- let's just take the Sacramento River settlement contractors. Would there be any situations in your modeling where the Sacramento River settlement contractors received less than 75 percent supply as provided in the contracts other than a situation where Shasta Reservoir hits dead pool?

WITNESS MUNEVAR: I think which I just described. So you have -- if the land-use based indicated that the demand was less, that would be one condition.

The other ones would be if there was only enough supply to release -- you were at dead pool and you were -- only enough supply to release minimum stream flows, that could be a second condition.

In general, you are correct. The only times we should see shortages to those contractors is when dead pool is reached.

MR. O'BRIEN: In the MBK modeling, were the operating criteria for the conveyance of stored water inconsistent in any way between the MBK no-action alternative and Alternative 4A?

WITNESS MUNEVAR: Yes, they were. But to be quite honest, it's very difficult to understand how they are different because they were essentially input time series. But they are different between the no-action and the WaterFix.

MR. O'BRIEN: But you can't tell me specifically how they're different?

WITNESS MUNEVAR: I can tell you specifically how they are different in the model, yes.

MR. O'BRIEN: Please go ahead.

WITNESS MUNEVAR: They had input a time series both in the no-action and in the WaterFix of export estimates. In the -- in the -- and I indicated there are times in which they over -- ignored those time series. And in the WaterFix, there are times in which they have a -- I believe it's called a correction. So they make an additional adjustment to the WaterFix allocations that are not in the no-action allocation.

But the basis for that I have, in part -- large part of our rebuttal is we cannot understand the basis for it because they are input time series. There's no rule driving it. There's no behavior that emulates the model operation that we can understand from that.

MR. O'BRIEN: All right. I'd like to move to

the portion of your testimony that generally is under the heading that the MBK modeling of discretionary decisions is flawed.

I'd like to start with DB7, please. This again is from Mr. Munevar's testimony.

Why don't you go ahead and read that. Let me know when you're ready.

WITNESS MUNEVAR: Okay.

MR. O'BRIEN: In the operational assumptions that MBK utilized in their modeling, do you know whether there was ever unused export capacity in their assumptions?

WITNESS MUNEVAR: I did not evaluate that, so I don't know.

MR. O'BRIEN: So you don't know whether MBK assumed the most aggressive possible set of operational assumptions in terms of moving stored water through the WaterFix facilities?

WITNESS MUNEVAR: I can't put a level to the aggressiveness.

MR. O'BRIEN: Well, I guess my question really is: Do you think that MBK could have been more aggressive in the operational assumptions they made with WaterFix in place?

WITNESS MUNEVAR: It's a hypothetical here.

You could move all the water out of north of Delta storage and move it through the facilities.

MR. O'BRIEN: So there would have been capacity in the system to move more water out of storage than was assumed by MBK; is that fair?

WITNESS MUNEVAR: There may be capacity in the system, but there are -- there are whole suite of limitations that drive operations and protection of upstream storage. So it's not -- it's not a capacity assessment necessarily.

MR. O'BRIEN: Let me ask it very directly. MBK in their testimony has said, "We did not pick the most aggressive series of operational assumptions about moving water out of storage with WaterFix in place."

Do you agree or disagree with that? Or do you have in opinion?

WITNESS MUNEVAR: I don't have an opinion as to the level of aggressiveness and whether one could construct a more aggressive operation.

MR. O'BRIEN: Okay. Fair enough.

If we could pull up DB8.

First of all, do you agree with that statement by Mr. Bourez that you've reflected in your testimony?

WITNESS MUNEVAR: Yes.

MR. O'BRIEN: I'd like to take the three

individual pieces -- allocation logic, San Luis rule curve, and use of JPOD -- separately.

We'll start with allocation logic. Pull up DB9 now, please.

Why don't you go ahead and take a minute to read that.

WITNESS MUNEVAR: Okay.

MR. O'BRIEN: You used the phrase "manually derived export estimates."

What do you mean by that phrase?

WITNESS MUNEVAR: I mean that the export estimates, the logic that the petitioners have and which has been standard CalSim modeling, has a -- sets of rules that are in there that calculate the export estimate based on the conditions, trying to emulate what operational behavior would indicate. MBK's modeling has removed that, that portion of the logic, and in place of that has essentially a time series of manually developed export estimates.

MR. O'BRIEN: Did the petitioners in their modeling manually reduce export estimate for Scenarios H4 and B2?

WITNESS MUNEVAR: I do not recall at this particular time. I can get back to you on that.

MR. O'BRIEN: I appreciate that.

Do you know if petitioners ever manually changed the export estimates for Scenarios B1, B3, or Alt4, H3 Plus.

MR. MIZELL: I'd like a clarification. Is Mr. O'Brien referring to B2? I don't believe we presented a Boundary 3.

MR. O'BRIEN: Sorry. B2. Thank you.

WITNESS MUNEVAR: Right now, for H3 Plus, I know there were not adjustments made to the export estimate in our modeling, petitioners modeling between no-action and H3 Plus.

I don't believe the others were modified either, but I can confirm that at the break.

MR. O'BRIEN: Thank you.

And if there were changes made in the export estimates, would there be written documentation for that?

WITNESS MUNEVAR: They would be part of the model code sets that have been provided.

MR. O'BRIEN: Would there be any other documentation of what exactly was done?

WITNESS MUNEVAR: I don't know if that -- if that would exist if there are changes.

In all cases, we use the same operational behaviors and rules that are part of determining export

estimates. There was not a predetermination of that export estimate. And I believe they are the same, but I will confirm.

MR. O'BRIEN: Are you familiar with the term "perfect foresight"?

WITNESS MUNEVAR: I am familiar with the term.

MR. O'BRIEN: And how do you define that term?

WITNESS MUNEVAR: I'll define it from -- in the context of allocation behavior. Typically, in allocation behavior, we use uncertain forecasts. So as Mr. Leahigh testified, we use, in some cases, a 90 percent exceedance forecast, not the actual flows that resulted in a particular year.

And in part that's -- that understanding of not knowing the future leads to essentially a more conservative operation. In fact, the 90 percent forecast means 90 percent -- there's 90 percent exceedance. Means that 90 percent of the time it is likely that that forecast will be exceeded.

A perfect foresight would either take the actual flows -- so I'm assuming that you are not -- that you have the ability to predict the future -- would use those actual flows in determination of allocations or may run the scenario to the end of the year and then adjust operations backward in time.

So that's how I would -- that's how I would say perfect foresight.

MR. O'BRIEN: Does the petitioners' modeling contain any assumptions about future State Water Project and CVP operations that were made using perfect foresight, in your opinion?

WITNESS MUNEVAR: That's hard to say across every element of the modeling. In some cases there just are not forecasts available and that may be used. But in the allocation delivery setting, we're using uncertainty forecasts. And in the export estimates, we're assuming conservative export estimates.

MR. O'BRIEN: But as you sit here, can you think of any assumptions that were made in the modeling about future state project and CVP operations that were made with perfect foresight?

WITNESS MUNEVAR: I can't think of any right at this particular time.

MR. O'BRIEN: Do any of the methods used by the petitioners' modeling to make water supply allocations use perfect foresight?

WITNESS MUNEVAR: No, I would not -- I would not describe it that way.

MR. O'BRIEN: If you could pull up DB9, please.

MR. BERLINER: Isn't that DB9 that's up?

MR. O'BRIEN: Referring to line 7, DB9, you used the term "standard modeling protocols." Are those standard modeling protocols written down anywhere?

WITNESS MUNEVAR: To the extent that they're documented in the CalSim modeling, they may be there. I've not looked to see if those standard protocols are implemented. I believe they are described in some modeling documents, but I don't have the references off the top of my head.

MR. O'BRIEN: Now let's on move to San Luis rule curve. DB10, please.

MR. BERLINER: Can I ask for a time check? It's about noon. Witnesses have been testifying for a while.

CO-HEARING OFFICER DODUC: He's on his fourth of five issues.

MR. O'BRIEN: I think my hour and 15 minute estimate was pretty good. Maybe a little bit less than that.

CO-HEARING OFFICER DODUC: All right.

MR. OCHENDUSZKO: And the clock was set for one hour. At the end of this, we'll reset for another 15 minutes.

CO-HEARING OFFICER DODUC: I think we can take

a break at 12:15.

MR. BERLINER: Thank you.

MR. O'BRIEN: Have you had a chance to read that, Mr. Munevar?

WITNESS MUNEVAR: Yes, I have.

MR. O'BRIEN: So the petitioners' modeling has a higher San Luis rule curve during the spring months; is that correct?

WITNESS MUNEVAR: That is correct for -- I believe for the CVP -- the CVP San Luis rule curve.

MR. O'BRIEN: And your modeling contemplates the release of water from upstream because of more storage during the spring months; is that correct?

WITNESS MUNEVAR: No, that's not correct.

The point in this statement was that the WaterFix enables additional excess water to be captured during certain parts of the spring months. Whereas in the no-action in the biological opinions in which we're quite restrictive during those same months, there's a lesser ability to -- to pick up those excess flows in the Delta. And that change in operational flexibility is what led us to adjustments in the San Luis rule curve.

MR. O'BRIEN: Now, DB11, please let me know when you're ready.

WITNESS MUNEVAR: Okay.

MR. O'BRIEN: So in the petitioners' modeling, the San Luis rule curve was changed from the rule curve formulation contained in the no-action alternative; is that correct?

WITNESS MUNEVAR: In the petitioners no-action alternative, correct.

MR. O'BRIEN: And the reason for that change is that in the no-action alternative, a higher level of exports in the fall is appropriate given the export restrictions in the spring; is that a fair summary?

WITNESS MUNEVAR: Yeah. Again, the San Luis rule curve is meant to emulate an operational behavior of when and how much water might be moved from storage during the -- based on the requirements on the system. And given that -- that there was less ability to move that water in the spring in the no-action, water had to be moved a little earlier in the year in order to meet allocations.

MR. O'BRIEN: I'd like to refer you to lines 3 to 5, where you say: "However, under the CWF greater ability to capture excess flows in the winter and spring requires less movement of stored water in the late summer and fall as compared to the NAA."

My question is: How will the CVP capture more

excess water in the winter and spring?

WITNESS MUNEVAR: Under the California WaterFix, the ability to divert from the North Delta diversion could enable a greater ability to export surplus or excess water -- I don't like those terms. But water that does not have another requirement in the system enables a greater ability to export that water in the winter and spring due to the California WaterFix and the North Delta diversion facilities and associated bypass flows.

MR. MIZELL: If I may, again for clarity, and I think this was inadvertent, but I'd like to confirm with Mr. O'Brien. His question was phrased in terms of how will the CVP capture excess flows when the testimony is talking about the CWF. Was it your intent to reference only one of the two projects?

MR. O'BRIEN: My intent was to focus on the CVP.

Was this change in the San Luis rule curve ever discussed with Mr. Leahigh and Mr. Milligan or other operators?

WITNESS MUNEVAR: I don't recall whether the changes to the rule curve were, but the results of the modeling have been discussed with Mr. Leahigh and I believe with Mr. Milligan as well.

MR. O'BRIEN: Okay. Let's move to JPOD, DB13.

I'm actually going to skip to DB15. I think we can move past this one. Sorry.

Ready?

WITNESS MUNEVAR: Yes.

MR. O'BRIEN: Is it possible for CVP operators to estimate Jones pumping when making CVP allocations?

WITNESS MUNEVAR: They do make an estimate of an estimate of Jones' pumping availability in making allocations.

MR. O'BRIEN: And is it similarly possible for State Water Project operators to estimate Banks' pumping capacity when making SWP allocation decisions?

MS. AUFDEMBERGE: I'm going to object. This has been asked and answered to the appropriate witnesses. This has been answered by -- excuse me -- the operating witnesses.

CO-HEARING OFFICER DODUC: I'm sorry. Your objection is?

MS. AUFDEMBERGE: Asked and answered by other -- by the operators.

CO-HEARING OFFICER DODUC: Mr. O'Brien, I assume you were going for Mr. Munevar's perspective?

MR. O'BRIEN: Yes. Thank you.

CO-HEARING OFFICER DODUC: Overruled.

WITNESS MUNEVAR: Could you repeat the last question? I apologize.

MR. O'BRIEN: Yes. Basically, the same question I asked you for the CVP on the State Water Project side. Is it possible for State Water Project operators to estimate Banks' pumping capacity when making State Water Project allocations?

WITNESS MUNEVAR: Yes, it's possible, and they do. And just to clarify the time frames, so they're making allocations in, say, March/April/May, and they're making estimates of that capacity through -- through summer, through August/September.

So they -- it's possible for them to make estimates, but they are only estimates.

MR. O'BRIEN: Last topic, stressed water supply conditions. If we could move to DB16.

Let me know when you're ready.

WITNESS MUNEVAR: I'm ready.

MR. O'BRIEN: When you use the phrase "stressed water supply conditions," what do you mean?

WITNESS MUNEVAR: In general in my testimony, when I talk about stressed water supply conditions, I'm talking about conditions in which one or multiple reservoirs may have reached dead pool conditions.

MR. O'BRIEN: And you also used the phrase

"the generalized nature of specified operations rules."

What do you mean by that?

WITNESS MUNEVAR: Well, CalSim in general is not meant to identify an off ramp or specific operational rule for one particular critical year. All the rules that are implemented in CalSim are generalized to operate across a range of conditions. And so that's what I meant by that -- by that statement.

MR. O'BRIEN: When you say that the CalSim II model results should only be considered as an indicator, what do you mean by "as an indicator"?

WITNESS MUNEVAR: We would expect, in particular in the runs that were prepared for -- by the petitioners in which we are simulating conditions under a future climate and sea level change conditions, we have a slightly greater increase in frequency of these stressed water supply conditions. And that we would anticipate that under realtime operations, there would be some adjustments that might be made such that reservoirs do not hit dead pool conditions.

MR. O'BRIEN: So when you say "should only be considered as an indicator of stressed water supply conditions and should not necessarily be understood to reflect literally what would occur in the future under a given scenario," I interpret that -- and tell me if you

agree or disagree -- saying that the CalSim II model results in stressed water supply conditions are not particularly reliable.

Is that a fair interpretation?

WITNESS MUNEVAR: I'll rephrase it. The way I would describe it is this is where models are fantastically useful. We're trying to project the future conditions under climate change and sea level rise, not even the most extreme that could be envisioned over the course of a century. And we're indicating -- or models are indicating that there are conditions in which the system has to -- has to behave, has to respond differently than perhaps our current regulatory requirement.

So the CalSim model does not implement adaptations for those -- or those conditions. It does not specifically prescribe how you would get out of those particular conditions. What it does indicate is the frequency and, in some cases, the magnitude of the stressed water supply conditions. So that's what was meant by this statement.

MR. O'BRIEN: Does the statement have anything to do with the possibility that TUCP orders might be obtained in the future and we simply don't know exactly what they would provide for?

WITNESS MUNEVAR: Yeah. I think philosophically in our modeling, we did not try to predetermine the future, the future regulatory environment. And that was a -- a very purposeful behavior on modeling for the WaterFix.

MR. O'BRIEN: So you didn't attempt to predict what the State Water Board might do in a future TUCP in a stressed water supply situation?

MR. BERLINER: Objection. Misstates his testimony.

MR. O'BRIEN: You can correct me if I said it wrong.

CO-HEARING OFFICER DODUC: In what way misstated, Mr. Berliner?

MR. BERLINER: Well, we just jumped from what action might occur in the future under a stressed condition to what terms might the Water Board impose in TUCP.

And the question presupposed that the answer to the prior question was that we would see a TUCP, where the actual answer was there could be any number of actions that were taken.

CO-HEARING OFFICER DODUC: Mr. O'Brien, do you wish to clarify?

MR. O'BRIEN: I'm just trying to understand

what the modeling assumes in stressed water supply situations. And I think Mr. Munevar said in his previous answer that we're not trying to predict. And I just wanted to make sure I had a nice clear understanding that he's not -- in the modeling, they're not trying to predict what the Water Board might do in a future TUCP. That was the only point of my question.

MR. BERLINER: And my objection was that it assume that there would actually be a TUCP.

CO-HEARING OFFICER DODUC: So rephrase your question, Mr. O'Brien. If there should be a TUCP.

MR. O'BRIEN: If in the future there were to be a TUCP order issued by the State Water Board, does your modeling in any way attempt to make assumptions about what that future order would provide?

WITNESS MUNEVAR: It makes no assumptions related to TUCPs.

MR. O'BRIEN: Just -- thank you. I have no further questions.

CO-HEARING OFFICER DODUC: Please remind me of the two -- well, I definitely heard one, maybe two questions where you were going to get back to Mr. O'Brien after the lunch break.

WITNESS MUNEVAR: If I remember correctly, I think they were related to the export estimate in other

scenarios, not H3 Plus. And I will confirm that at the break whether there were any adjustments made.

CO-HEARING OFFICER DODUC: Was there a second question, or did he ultimately answer it after circling back?

MR. O'BRIEN: There were a couple different scenarios, same set of questions, where you were going to check to see whether there had been any changes made in the export estimates.

WITNESS MUNEVAR: I will confirm all of them at the break.

CO-HEARING OFFICER DODUC: All right.

MR. BERLINER: I'll try and meet with Mr. O'Brien before we take off here to make sure we're responding to the right ones.

CO-HEARING OFFICER DODUC: All right.

Are there any other questions from Group 7 for Mr. Munevar?

Mr. Bezerra, is that it?

And are there any other questions for Dr. Nader Tehrani from Group 7? I didn't think so. I thought I'd ask.

Take our lunch break and resume at 1:20.

After Group 7, I believe Ms. Nikkel, you are up next.

(Whereupon the luncheon recess was taken at 12:17 p.m.)

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MAY 5, 2017 AFTERNOON SESSION 1:20 P.M.

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CO-HEARING OFFICER DODUC: All right. It's 1:20. We're back in session.

Mr. O'Brien, do you need to come back up for Mr. Munevar to address your outstanding issue or have you done that?

MR. O'BRIEN: We haven't spoken yet, but I think we're going to handle it a different way.

CO-HEARING OFFICER DODUC: I'll turn it over to Mr. Bezerra.

How much time and what topic, Mr. Bezerra?

MR. BEZERRA: I think it's 15 minutes to 30 minutes, depending on the answers.

And the topics are stressed conditions and how they to relate to Mr. Munevar's testimony about injuries. Some materials about San Luis rule curve that I thought I would be able to ask Ms. Parker about, but sounded like it's more appropriate for Mr. Munevar. And then some of -- a few of his statements about JPOD.

CO-HEARING OFFICER DODUC: All right. Please proceed.

--o0o--

CROSS-EXAMINATION

MR. BEZERRA: My first question is: I want to

make sure I pronounce your name correctly because I have had a difficult time understanding that. So if you could state it, I would appreciate it, and I will try my level best to get it right.

WITNESS MUNEVAR: It's Munevar. But if you say "whenever" and replace the WH with an M, then you're probably okay.

MR. BEZERRA: Thank you very much. I appreciate that. My wife tells me I'm terrible with pronunciations, and she's probably right.

Mr. Munevar, before the break, you were discussing with Mr. O'Brien stressed water supply conditions, correct?

WITNESS MUNEVAR: Yes.

MR. BEZERRA: And, in general, you testified that the modeling only indicates problems in those conditions and probably doesn't accurately reflect what might occur in those conditions, correct?

WITNESS MUNEVAR: Correct. It would -- I think I testified it's indicative of stressed water supply conditions when we -- when we hit dead pool in modeling.

MR. BEZERRA: Do stressed water supply conditions generally occur in critical water years?

WITNESS MUNEVAR: Generally, yes.

MR. BEZERRA: Could we please pull up Mr. Munevar's testimony, DWR-86 errata and page 4, please.

Thank you.

Now, Mr. Munevar, you testified about this previously. Figures 1 through 5 in your analysis are MBK's depictions of water supply deliveries to various water users, correct?

WITNESS MUNEVAR: That's correct, from MBK's modeling.

MR. BEZERRA: From MBK's modeling. And the columns in these figures that are denoted C, those are deliveries in critical water years, correct?

WITNESS MUNEVAR: That's correct.

MR. BEZERRA: And in those columns, in these graphs, do you include deliveries in years when you consider stressed water supply conditions to exist?

MR. BERLINER: Objection. Vague. Delivery as to who?

MR. BEZERRA: I can walk through each and every one of the figures.

MR. BERLINER: No, I'm just asking --

CO-HEARING OFFICER DODUC: Deliveries to whom?

MR. BEZERRA: To each of the classes of water users who are depicted in these figures.

CO-HEARING OFFICER DODUC: So this one would be the Sacramento River settlement contractors?

MR. BEZERRA: Correct.

CO-HEARING OFFICER DODUC: For example.

MR. BEZERRA: For example.

WITNESS MUNEVAR: Yes. What's depicted in Figures 1 through 5 for the last panel where it says C are critical year deliveries, and all of those are -- all of the critical years. Some of which may be what I would call stress conditions, but some perhaps not.

MR. BEZERRA: Correct. So that C column includes deliveries in what you consider stressed water supply conditions?

WITNESS MUNEVAR: It could include them.

They're just a -- follow-up on the previous question. While it's most likely that those stressed water supply conditions are in critical years, it could be that they're no storage conditions in a dry year, for example, that was the result of that long-term drought that might have come into play.

MR. BEZERRA: So to the extent that these figures depict deliveries in dry years, would those include the dry years in which you considered stressed water supply conditions to occur?

WITNESS MUNEVAR: Includes all dry years.

MR. BEZERRA: So they would include the years in which you considered stressed water supply conditions to occur?

WITNESS MUNEVAR: Yes.

MR. BEZERRA: Okay. Thank you.

Could you turn to page 85 of DWR-86 errata. And, Mr. Munevar, beginning on this page, there are Figures 14, 15, 16, 17, and 18 on page 37, correct?

WITNESS MUNEVAR: That's correct.

MR. BEZERRA: And these figures are also depictions of deliveries as to certain classes of water users, correct?

WITNESS MUNEVAR: Correct.

MR. BEZERRA: These graphs depict results from the biological assessment modeling, correct?

WITNESS MUNEVAR: These graphs depict results from the sensitivity analysis around the biological assessment modeling. I think it's important to clarify that. These are current climate in Q0 and then the two extreme climate scenarios, Q2 and Q4.

The biological assessment modeling primarily relied upon the Q5, which is the kind of consensus-based climate assessments.

MR. BEZERRA: Okay. Can we please scroll up to the bottom of page 34 of this exhibit?

And the sentence begins on line 26, states: "To further demonstrate that CWF does not cause any effects beyond NAA, results for key deliveries for Q0, Q2, and Q4 climate change projections under the NAA and CWF H3 Plus are shown in Figures 14 through 18."

That's your testimony, correct?

WITNESS MUNEVAR: Yes. Correct.

MR. BEZERRA: So you are relying on these figures to testify that California WaterFix does not impact water users beyond the no-action alternative, correct?

WITNESS MUNEVAR: No, not quite correct. If you look at where this is in the testimony, this is rebuttal to protestants' arguments that we did not consider a wide range of climate change conditions. And so this was a mere depiction of the range of climate conditions that were considered. So this was prepared for a slightly different purpose.

MR. BEZERRA: Okay. Your testimony states that these figures are to further demonstrate that CWF does not cause any effects beyond no-action alternative, correct?

WITNESS MUNEVAR: Correct. It was intended to show how CWF would operate under different climate conditions and the relative changes or no changes to

deliveries under those identical climate and sea level rise considerations.

MR. BEZERRA: Okay. And the model results in Figures 14 through 18, those all include critical water supply conditions as you have defined them, correct?

WITNESS MUNEVAR: They include all of the 83 years, including critical conditions.

MR. BEZERRA: And those are the critical conditions in which you state that modeling results should only be taken as indictors of critical conditions, correct?

WITNESS MUNEVAR: You're mixing two different points, I think.

MR. BEZERRA: Okay.

WITNESS MUNEVAR: The previous one on stressed water conditions, the purpose of this analysis was to show not whether climate change caused some -- some outcomes that were in the no-action and the WaterFix did not exacerbate it. So this is -- yeah, I kind of lost track of your question. But it's not identical to the previous assessment.

MR. BEZERRA: Okay. And I thought I was asking a pretty simple question. I'll try it again.

WITNESS MUNEVAR: Maybe you were.

MR. BEZERRA: The modeling results in these

figures, they all incorporate results from years in which you believe stressed water supply conditions occurred, correct?

WITNESS MUNEVAR: Yes, they're inclusive of those.

MR. BEZERRA: Okay. Moving on to the San Luis rule curve.

In general, one of your critiques of MBK's modeling is that they did not change the San Luis rule curve between the no-action scenario and the proposed action, correct?

WITNESS MUNEVAR: That's correct.

MR. BEZERRA: Okay. And pull up BKS 101 which I discussed with Ms. Parker this morning, and in particular the last page. If we could pull up the last page of that file please, Mr. Baker. If we could scroll down to the bottom please.

Mr. Munevar, were you involved in the preparation of the biological assessments modeling?

WITNESS MUNEVAR: I was.

MR. BEZERRA: Okay. And just to state again for the record, Exhibit BKS 101 is excerpts of Appendix 5A from the biological assessment from July 2015, the entire biological assessment, staff Exhibit SWR CB104.

If we could refer down at the last sentence which states: "Sensitivity analyses indicated that using the NAA's more aggressive rule to move water south earlier in the water year than in the PA would yield a little more delivery but would be at the expense of upstream storage."

Do you see that?

WITNESS MUNEVAR: Yes, I do.

MR. BEZERRA: Were you involved in conducting those sensitivity analyses?

WITNESS MUNEVAR: I was involved in the review of some of those analyses.

MR. BEZERRA: And this sentence indicates the BA model and the petitioners selected a San Luis rule curve that was more protective of upstream storage than the no-action alternative rule curve, correct?

WITNESS MUNEVAR: No, that's not correct.

The San Luis rule curve was adjusted to reflect that there was a greater operational flexibility in the California WaterFix scenarios to export excess water in the Delta during the spring.

And that was the -- that was the intent to -- if more water could be moved in spring, there was less of a need to move the water in summer or fall.

MR. BEZERRA: And just to clarify, the choice

was then made to use the -- that San Luis rule curve as opposed to the no-action alternative San Luis rule curve in the biological assessment modeling?

WITNESS MUNEVAR: That's correct.

MR. BEZERRA: Okay. If we could now refer back to Exhibit DWR errata -- excuse me -- DWR-86 errata on page -- I believe it's 7. I have to apologize. There's a piece of the testimony I need to find, but I can ask the question generally.

There's a portion of your testimony here in which you talk about -- you critique DWR -- excuse me -- MBK's changes to modeling and state that they introduced bias into the modeling, correct?

WITNESS MUNEVAR: That's correct in several areas.

MR. BEZERRA: And you state that when discretionary decisions related to California WaterFix are applied inconsistently between the proposed action and the no-action alternative, that creates bias in the modeling. Is that your opinion?

WITNESS MUNEVAR: I think the large basis of the opinion was that they had modified the export estimates considerably without translating that into a rule that could specifically be operated or at least linked to an operational rule.

MR. BEZERRA: Okay. And so on Exhibit DWR-86 errata, at the bottom of page 7, you talk about the changes that you critique and you state, beginning on line 26: "These changes include," and then moving on to the bottom -- the top of page 8 -- "lack of changes in San Luis rule curve."

Do you believe that the MBK's decision not to change the rule curve introduced bias into the modeling?

WITNESS MUNEVAR: I think so. I think that their modeling did not acknowledge that the system had -- had changed in its operational behavior to move water at different times of the year.

MR. BEZERRA: So your opinion is that petitioners' decision to change the San Luis rule curve between the proposed action and no-action alternative did not introduce any bias into the modeling, correct?

WITNESS MUNEVAR: That's correct. Largely because if you view the historical changes that have occurred in the operation of the project, we went from D1485, 1641, and progressively had more and more restrictions on the export capability of the projects. And the rule curve was thus adjusted --

CO-HEARING OFFICER DODUC: Finish.

WITNESS MUNEVAR: -- was thus adjusted to reflect those operational changes.

Now, when we have a WaterFix which has a different capability to move water, it's important to recognize that the operational behavior should accommodate that.

MR. BEZERRA: In operating the CVP and SWP in realtime, the operators would not be required to operate according to any San Luis rule curve, correct?

WITNESS MUNEVAR: I think I -- like I testified before, the San Luis rule curve is meant to emulate an operational decision. The operators, I don't believe, use a specific rule curve; they use much more of their discretion and operational decision.

MR. BEZERRA: So operator's discretion in operating projects rather than any San Luis rule curve would govern operations with the projects with the WaterFix in place, correct?

WITNESS MUNEVAR: Yeah. The rule curve is meant to emulate that operational decision.

MR. BEZERRA: Thank you. Okay.

CO-HEARING OFFICER DODUC: You still have JPOD to address, right?

MR. BEZERRA: Yes, very briefly.

CO-HEARING OFFICER DODUC: Time flew by. Was that an hour already? Go ahead, give him another 10 minutes to finish up with JPOD.

MR. BEZERRA: Thank you.

DWR-86 errata, page 16, beginning on line 17.

Here you state: "It is not possible for reclamation to include JPOD export wheeling capacity as part of the allocation-setting process in March through May given the uncertainty and predictability of the available Banks pumping capacity in summer months."

Mr. Munevar, do you know whether the operators of the project available Banks pumping capacity for purposes of projecting the movement of transfer water through the Delta?

WITNESS MUNEVAR: I don't -- I don't know. That would be a better question for Mr. Leahigh.

MR. BEZERRA: I'm happy to have Mr. Leahigh answer, if he'd like.

WITNESS LEAHIGH: Yes, we do.

MR. BEZERRA: And do those decisions about how to move transfer water through JPOD capacity occur in the March through May time period?

WITNESS MUNEVAR: Yes. As I testified, though, there's a range of uncertainty that we're dealing with in terms of that estimation. And there's a very large degree of uncertainty.

So, in many cases, it's not going to be clear whether there is unused capacity that would be available

for anything other than State Water Project exports.

MR. BEZERRA: Do you currently project available JPOD capacity to move transfer water?

WITNESS LEAHIGH: We currently do project the probabilities that unused capacity would exist at the SWP export facilities in the summer. And that information is utilized by potential folks involved in water transfers.

MR. BEZERRA: And does this -- does that projection for transfers currently occur in the March through May time period?

WITNESS LEAHIGH: Yes.

MR. BEZERRA: Thank you. That completes my cross-examination.

CO-HEARING OFFICER DODUC: Thank you, Mr. Bezerra.

Does that conclude Group 7's cross-examination? All right.

Ms. Nikkel?

Unless there's any party between 7 and -- no, you're 8. No, Group 7.5.

Ms. Nikkel, you estimated 10 minutes on behalf of Group 8 and 45 minutes on behalf of Group 9.

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CROSS-EXAMINATION

MS. NIKKEL: I'm going to reduce that for you this afternoon. I will not be conducting any cross-examination on behalf of Group 8, only on behalf of Group 9, North Delta Water Agency.

CO-HEARING OFFICER DODUC: All right.

MS. NIKKEL: I have questions this afternoon directed for -- I'll start with Mr. Leahigh.

And then, Dr. Nader-Tehrani, I have questions for you as well.

Mr. Leahigh, I'm going to start with some conversations we had. Let me give you topic areas.

First, Mr. Leahigh, some questions regarding the use of models in project operations and forecasting, and then the use of the term "delta requirements" in his testimony.

And for Dr. Nader-Tehrani, I have several areas.

CO-HEARING OFFICER DODUC: Yes, I remember. This is an area where we'll allow you some latitude to ask questions that you had wanted to ask Dr. Nader-Tehrani when you requested to call him as your witness.

MS. NIKKEL: Yes, that's correct. That is --

I do have that line of questioning. I'll also be asking Dr. Nader-Tehrani more specifically about his rebuttal testimony in these areas: Water levels during low flows, the appropriate use of DSM2, D-1641 exceedances, and modeling anomalies.

And then finally, I'll conclude by the discussion of the analysis that was testified to in his rebuttal testimony regarding the North Delta contract as well as the additional areas that were the subject of the ruling on the motion for protective order.

CO-HEARING OFFICER DODUC: He's been well rested throughout Group 7's cross-examination, so he's ready.

MS. NIKKEL: Mr. Leahigh, I want to start by understanding a bit more about how your office uses models in project operations. So for project operations, do you use models to forecast corporations from the spring through the end of the water year?

MR. BERLINER: Object as being beyond the scope of his rebuttal. This was discussed in Part I. This is clearly a question that should have been asked in Part I-A.

And I appreciate that we discuss operations, we discuss models, but this is a very basic question that we discussed in Part I-A.

CO-HEARING OFFICER DODUC: I'm sorry. Foundational question.

So I will, in that vein, give you a little bit of leeway but not too much. We're not going to reopen the entire --

MS. NIKKEL: I believe you'll see where I'm going after a couple of questions.

CO-HEARING OFFICER DODUC: Thank you.

Overruled, Mr. Berliner.

WITNESS LEAHIGH: I'm sorry. Could you repeat that question?

MS. NIKKEL: Sure. For project operations, do you use models to forecast operations from the spring through the end of the water year?

WITNESS LEAHIGH: Yes, we do.

MS. NIKKEL: And those models are something different than the CalSim models that we've been -- utilized in the proceeding here today, correct?

WITNESS LEAHIGH: Yes, that's correct.

MS. NIKKEL: So I'm going to refer to those as the operations models just so we know what we're talking about something different than the CalSim models.

Do those -- excuse me. Do those operations models simulate operations based on a given set of parameters or do they require operators to manually

input certain components of operations such as reservoir releases and exports?

WITNESS MUNEVAR: Well, it's both. There are parameters that we need to adhere to, but the specific releases and those sorts of information are manually entered, yes.

MS. NIKKEL: So you mentioned reservoir releases as manually input. Would the answer be the same for exports, they're manually -- export allocations, are those manually inputted into the operations manual -- models?

WITNESS LEAHIGH: Yes.

MS. NIKKEL: And when you use those operations models, do you use the same forecast of June through September exports for each year or do those expert estimates vary based on year type?

WITNESS LEAHIGH: Well, they will vary depending on a number of things: Year type, storages that are available, runoff forecasts, similar number of -- number of parameters that will affect the forecasted exports.

MS. NIKKEL: Okay. Thank you. That's all I have on that line.

I'd like to talk about the use of your term "Delta requirements" in the testimony in your rebuttal

testimony. If we could pull up DWR-306, please.

Sorry I got that wrong. DWR-78.

First, as a foundation, I believe you testified in the first part of the hearing that you are familiar with the contract between DWR and North Delta Water Agency that has been marked as DWR-306, correct?

WITNESS LEAHIGH: Yes, I am familiar with it.

MS. NIKKEL: If we could go to page 6 of DWR-78, please. Let's look at line 19.

So here I'm looking specifically at the sentence starting: "In 2012, over 40 percent of the releases were needed for Feather River flow requirements, Delta requirements, or pass through of natural flow to meet downstream water rights diversions of other users."

In that sentence, is the North Delta contract one of the Delta requirements that you refer to?

WITNESS MUNEVAR: Not explicitly. The Delta requirements would certainly also take into account a consumptive uses in the Delta. So to the extent that the North Delta water users are part of that consumptive use, that would be one component of Delta requirements.

MS. NIKKEL: So you're talking about the use of water rights -- North Delta users within the North Delta. The North Delta contract, however, has

certain water quality criteria and requirements, correct?

WITNESS LEAHIGH: That's correct.

MS. NIKKEL: Are those water quality criteria among the Delta requirements that you refer to in that sentence?

WITNESS LEAHIGH: Well, the Delta requirements is more specifically addressed to the D-1641 flow and water quality objectives. And, frankly, if we are meeting the D-1641 flow and water quality objectives, we found we found that we would also be meeting all the North Delta Water Agency contract water quality objectives.

MS. NIKKEL: I recall your testimony, and I won't belabor that point as we did in the first part of the hearing.

Just so I can understand some other statements in your testimony, if we could go to page 33, please. At line 3 -- I'm sorry, line 18.

In the last sentence, it refers to water quality requirements. Could you please read that sentence, and tell me if water -- by "water quality requirements" you included compliance with the water quality requirements of the North Delta contract?

WITNESS LEAHIGH: So you're referring to the

last sentence in that paragraph?

MS. NIKKEL: That's correct. The one that starts "In Addition."

WITNESS LEAHIGH: Uh-huh. I'm referring to the D-1641 requirements.

MS. NIKKEL: And if you can scroll down to line 23, please.

And the sentence that starts with, "However, at times" and there you use the phrase "to meet other obligations."

Does the phrase "other obligations" include meeting the water quality criteria in the North Delta contract?

WITNESS LEAHIGH: Well, again, not explicitly. But as I said, the -- it would include the meeting water quality standards in D-1641 which I've already testified, would typically meet those requirements as well.

MS. NIKKEL: Okay. And then I just have one more question on this particular topic. If we could see DWR-851, please.

In this exhibit, in the key at the bottom, it looks like the green color refers to Delta requirements. Would your answer be the same as we discussed with respect to Delta requirements in your testimony, that it

does not directly include the North Delta water quality requirements?

WITNESS LEAHIGH: That's right, not directly. But, again, it would include the D-1641 requirements which also would cover the North Delta requirements.

MS. NIKKEL: Mr. Leahigh, did you review any modeling results related to compliance with the North Delta water quality requirements under WaterFix operations?

WITNESS LEAHIGH: Yes, I did look at some of those.

MS. NIKKEL: Are those modeling results the same as we saw from Ms. Sergent, marked DWR-901?

If you'd like, we could pull them up.

WITNESS LEAHIGH: Yeah. I would have to see them. I don't recall.

MS. NIKKEL: If we could see DWR-901.

Mr. Baker, if you could scroll through and Mr. Leahigh could have a moment to review.

Mr. Leahigh, are you familiar with these documents?

WITNESS LEAHIGH: I remember looking at graphs similar to these. I don't know if these are the exact same ones I looked at, but perhaps.

MS. NIKKEL: Can you tell me what you recall

about the graphs that you did look at?

WITNESS LEAHIGH: Not offhand.

MS. NIKKEL: So, as you sit here today, you don't recall the modeling results that you reviewed that were related to compliance with the North Delta contract requirements?

WITNESS LEAHIGH: No, I don't recall.

MS. NIKKEL: That's all I have for Mr. Leahigh. Thank you.

Dr. Nader-Tehrani.

WITNESS NADER-TEHRANI: Good afternoon.

MS. NIKKEL: Glad you get a chance to speak up.

WITNESS NADER-TEHRANI: I was getting tired.

MS. NIKKEL: If we could pull up Dr. Nader-Tehrani's testimony, please DWR-79. And we'll start on page 19, Figure 6.

WITNESS NADER-TEHRANI: Not the errata.

MS. NIKKEL: Not the errata. Page 19, Figure 6.

Dr. Nader-Tehrani, you testified regarding this figure yesterday, and this is depicting water levels at a point downstream on the Sacramento River; is that correct?

WITNESS NADER-TEHRANI: That's correct.

MS. NIKKEL: Would you say that this analysis would apply to a different location in a Delta slough where the river dynamics may be different than at this point on the river?

WITNESS NADER-TEHRANI: I was showing this particular -- I was showing this particular location because this is the location I believe to represent the lowest reduction in water level you would expect at the point immediately downstream of the North Delta diversion. Any -- and it is my testimony that if you consider any other locations in the Delta, the expected reductions in water level would be lower than what you see here.

MS. NIKKEL: And that would include in Delta sloughs?

WITNESS NADER-TEHRANI: That would include in Delta sloughs, correct.

MS. NIKKEL: Did you specifically analyze water levels at any Delta slough locations in the modeling?

WITNESS NADER-TEHRANI: I have looked at water level predictions by DSM2 at locations throughout the Delta.

MS. NIKKEL: And that would include locations in Delta sloughs?

WITNESS NADER-TEHRANI: Yes, that's correct.

MS. NIKKEL: Thank you.

And do you recall that you're -- that the analysis was any different in those locations than as indicated on this chart?

WITNESS NADER-TEHRANI: No. My main message here was that as you got further away from this particular location, the expected reduction in water level would be lower than what you see in this figure.

MS. NIKKEL: Thank you.

Move to page 13, Mr. Baker, at line 19.

I'd like to better understand that -- the sentence that starts on line 19 that reads: "Any general analysis based on CalSim II results should be based on the entire 82 years of record."

WITNESS NADER-TEHRANI: I'm sorry. What line again?

MS. NIKKEL: Starts on line 19. And it's the sentence that starts with the word "Any."

By "any general analysis," does that include an analysis in DSM2 using CalSim results?

WITNESS NADER-TEHRANI: In this particular statement, I was referring to Dr. Bray's analysis using CalSim II results, not DSM2.

MS. NIKKEL: Thank you for that clarification.

At line 16, Dr. Bray's analysis is described as looking at flow at Freeport.

Would that be within CalSim II or DSM2?

WITNESS NADER-TEHRANI: Freeport flows are model output from CalSim II.

MS. NIKKEL: Thank you.

If we could go to page 30, Mr. Baker, at line 4.

You testify that -- at the end of line 4: "DSM2 results would only tend to represent generalized long-term trends."

And this is the subject of your oral testimony yesterday. And as you explained, the results that you relied on using DSM2 are long-term averages and not on monthly or shorter time steps, correct?

WITNESS NADER-TEHRANI: I was relying on long-term monthly averages and also probably the exceedance plot as well.

MS. NIKKEL: Thank you.

As an expert in the field of the water quality, would you agree that there are times when long-time averages may not tell the whole story of water quality on a shorter time scale?

MR. BERLINER: Objection. Vague. We don't even have a subject matter as to what aspect of water

quality we're talking about.

MS. NIKKEL: We can be specific.

MR. BERLINER: That would be helpful.

MS. NIKKEL: In a situation -- let's try this, actually. Where a farmer is concerned about impacts to crops resulting from EC in a single day or even a single hour, would long-term averages be the correct tool to use to analyze those concerns?

MR. BERLINER: Objection. Beyond the scope of his testimony. Beyond the scope of his expertise.

MS. NIKKEL: I believe it's within the scope of his testimony because it's -- I'm interested in how DSM2 results ought to be used. And as I understand, he's an expert in DSM2 modeling. And my question is whether DSM2, using long-term general averages, is appropriate to address a concern related to daily or even hourly levels of salinity in the water.

CO-HEARING OFFICER DODUC: Objection overruled.

MR. BERLINER: I'm sorry. That's a different response than the question she asked. With all due respect --

MS. NIKKEL: I can rephrase.

CO-HEARING OFFICER DODUC: One at a time.

Ms. Nikkel, the question you just asked, I

assume you would like an answer to.

MS. NIKKEL: Yes.

WITNESS NADER-TEHRANI: Would you repeat the question?

CO-HEARING OFFICER DODUC: Ask it again.

MS. NIKKEL: Good to have a clean record.

Would you agree that in a situation where a farmer is concerned about impacts to crops resulting from a single day or even a single hour of irrigation with high salinity, DSM2 results using long-term averages would not be sufficient to analyze those impacts, correct?

MR. BERLINER: Same objections. Beyond the scope of rebuttal and beyond the scope of this witness's expertise. This question is being asked in terms of impacts to farmers as opposed to water quality objectives within DSM2.

MS. NIKKEL: I'd be happy to strike the term "farmer" if that would resolve the objection.

CO-HEARING OFFICER DODUC: Strike that term and try again, Ms. Nikkel. I would help you, but apparently that's viewed as bias on my part, so...

MR. BERLINER: Just for the record to make it clear, we find that the hearing officer's questions often are very helpful.

MS. NIKKEL: In this situation, I'm going to try again to get the right question that will get through here.

Would you agree, Dr. Nader-Tehrani, as an expert in the field of water quality that the uses of DSM2 long-term averages is not appropriate to analyze short-term water quality impacts on the scale of a daily or hourly water quality impact; is that correct?

WITNESS NADER-TEHRANI: This is a question where --

CO-HEARING OFFICER DODUC: I'm sorry. You need to get closer to the microphone. Really close.

WITNESS NADER-TEHRANI: Yes. So what I was trying to say, DSM2 in -- using in conjunction with CalSim II, it would not be -- you would not be able to rely on model results on a specific day or a specific month. I cannot comment on how that would affect the farmer or, you know, and so forth. So based on the -- the way the models are used, it would be best to the long-term averages, or, you know, even water year type averages or probability of exceedance and not rely on the model's predictions on a specific day or a specific month.

MS. NIKKEL: Thank you.

CO-HEARING OFFICER DODUC: Ms. Nikkel, I would

like a follow-up question to ask Dr. Nader-Tehrani.

If one were to want to examine those short-term impacts, is there presently a tool available to do so, a modeling tool?

WITNESS NADER-TEHRANI: Not to my knowledge.

MS. NIKKEL: If we could move, Mr. Baker, to page 36, line 3 to 4, the sentence starting "However."

The sentence reads: "However, the frequency of days California WaterFix scenarios exceeded D-1641 salinity requirements are mostly similar or lower compared to the no-action alternative."

And there's a footnote, and the footnote cites to DWR-513, Figures C1 through C6.

WITNESS NADER-TEHRANI: That's correct.

MS. NIKKEL: I'd like to ask a few questions about that based on this rebuttal testimony.

Can we pull up DWR-513? I'd like to focus on Figure C1.

This is actually EC1. If we could move to C1. I'm sorry. I don't have a page reference for you.

First I'd just like to note in Figure C1, it looks like you've used a 14-day average and not a monthly average; is that correct?

WITNESS NADER-TEHRANI: In order to quantify compliance to the water D-1641 water quality objective

as it is stated, we used the 14-day average model results.

MS. NIKKEL: So you would agree if there's a requirement that based on a shorter than monthly time step, it would be appropriate to use DSM2 to analyze it on that shorter time step?

WITNESS NADER-TEHRANI: As long as you're doing a comparative analysis, that is our only way of -- of making a -- a very educated guess as to whether we're -- you know, how well we're complying with that water quality objectives.

MS. NIKKEL: Thank you.

So here, as I understand Figure C1, the black line is the no-action alternative and the light gray line is the Boundary 1 scenario, correct?

And it might be useful, Mr. Baker, if we could zoom in on the figure because the lines are close together and can be hard to distinguish. And I want to focus on the period from approximately 60 percent to 100 percent. There we go.

Am I right in reading this chart that the gray line which represents the Boundary 1 scenario exceeds the D-1641 scenario approximately 10 percent of the time -- I'm sorry -- 20 percent of the time?

WITNESS NADER-TEHRANI: That would be roughly

correct.

MS. NIKKEL: And the no-action alternative, which is the black line, shows that it would -- D-1641 would be exceeded approximately 10 percent of the time, correct?

WITNESS NADER-TEHRANI: I'm reading it at about 12 percent.

MS. NIKKEL: Okay. So under the Boundary 1 scenario, WaterFix would cause maybe twice or just a little less the number of the violations of D-1641 and the no-action alternative?

WITNESS NADER-TEHRANI: I do not agree with that as I went over my last hearing in August testimony. I clearly explained that these are model exceedances, and I explained the reasons why I believe these are model exceedances and are not truly real exceedances.

MS. NIKKEL: And we'll get into that. Thank you for that clarification.

WITNESS NADER-TEHRANI: Yes.

MS. NIKKEL: But the model results show nearly twice the number of exceedances of 1641, correct?

WITNESS NADER-TEHRANI: That's correct. And you -- I might want to add that all you're showing here is one location. If you look at the other locations, you will see a different measure.

MS. NIKKEL: Yes. Thank you.

Let's look also at the H4 scenario, which is colored dark blue. Looks like the H4 shows modeling results exceeding the D-1641 standards about 15 percent of the time; is that correct?

WITNESS NADER-TEHRANI: That's about right.

MS. NIKKEL: In fact, there are no project scenarios that the modeling results show would result in a lower number of exceedances, correct?

WITNESS NADER-TEHRANI: That's correct.

MS. NIKKEL: So let's turn to the topic of modeling anomalies that you referenced, Dr. Nader-Tehrani.

WITNESS NADER-TEHRANI: Yes.

MS. NIKKEL: Let's look at DWR-79, page 38, line 17 -- line 19, there's a sentence that starts with the word "therefore."

And if you could read from the word "therefore," and read those two sentences, I'd like to ask you about the second sentence following.

WITNESS NADER-TEHRANI: Starting from: "There may be days"?

MS. NIKKEL: "Therefore, within the months where the salinity standard is transitioning."

WITNESS NADER-TEHRANI: Can you show me

Figure 12? I believe they're in a different exhibit. Exhibit 513; is that right? I -- this is not -- my testimony for the rebuttal that you're showing me is that --

MS. NIKKEL: DWR-79 is --

WITNESS NADER-TEHRANI: Okay.

MS. NIKKEL: I think it might be within --

WITNESS NADER-TEHRANI: I'm sorry.

MS. NIKKEL: We may be able to answer it without looking at that figure. Do you want to try my question and see if you can answer it?

My question relates to the sentence that reads --

WITNESS NADER-TEHRANI: Yes.

MS. NIKKEL: -- "This results in a few days within such months where the modeled salinity exceeds the compliance standard."

Have you conducted a quantitative analysis of how many such days are a result of the modeling anomaly or the monthly time step issue that you've described?

WITNESS NADER-TEHRANI: I have, but I don't recall the specifics, if you're going to ask specifics.

MS. NIKKEL: I was going to ask, specifically, how many is "a few days." Do you recall?

WITNESS NADER-TEHRANI: I don't recall.

MS. NIKKEL: Do you recall if it was a few days over the 16-year period or a few days within a year?

WITNESS NADER-TEHRANI: I don't recall the specifics, and this was just one of the many different modeling issues in relation to this 1641 water quality exceedance. What I characterize to be modeling, this happens to be one of the many.

MS. NIKKEL: One of the many analyses that you conducted?

WITNESS NADER-TEHRANI: No. One of the many modeling-related artifacts or modeling-related anomalies that would lead to what I consider to be model exceedances.

If you consider, for example, CalSim II, because CalSim II also considers -- you know, that's actually the model that looks at the water quality objectives. And in the entire 82 years of exceedance, all CalSim studies that are done I think only shows one or two months of exceedance typically.

So as far as the model CalSim goes, it think it's met the objective. It's only because of all these model-related issues are what's causing those larger exceedances that you're looking at.

MS. NIKKEL: So as I understand it, it sounds

to me like you did a -- you did do some sort of quantitative analysis to look at each of those exceedances?

WITNESS NADER-TEHRANI: That's correct.

MS. NIKKEL: That's correct?

WITNESS NADER-TEHRANI: And for the sake of the timing of -- efficiency, I was explaining one of those issues in detail as the one you're describing here.

MS. NIKKEL: And did you conduct an analysis as to each of those instances and attribute it directly to a modeling anomaly of which the monthly time stamp issue is one example?

WITNESS NADER-TEHRANI: That's correct.

MS. NIKKEL: But you don't recall the specifics of that analysis?

WITNESS NADER-TEHRANI: If you're asking me a statistic for the number of days and so forth, I don't have those numbers readily available at this minute.

MS. NIKKEL: Do you recall whether there were any exceedances that you could not -- that were not attributes to a modeling anomaly?

WITNESS NADER-TEHRANI: No, I don't.

MS. NIKKEL: You don't recall or there were none?

WITNESS NADER-TEHRANI: I don't recall if there were any specific that there was just no modeling-related anomaly and it's just a real exceedance.

MS. NIKKEL: And those -- that analysis that you're referring is not available -- actually, I'll ask this question first: Those -- the analysis has not been presented in this proceeding; is that right?

WITNESS NADER-TEHRANI: I only presented the partial part of the -- my testimony back last year to illustrate an example of what I consider model-related exceedance. This is the DSM2.

MS. NIKKEL: But the complete analysis you conducted has not been presented in this hearing?

WITNESS NADER-TEHRANI: That's correct.

MS. NIKKEL: And do you know if that analysis is available publicly?

WITNESS NADER-TEHRANI: That is not available publicly, no.

MS. NIKKEL: Just one final question since we have an analysis here that nobody's seen before: Can you just generally describe how it is that you analyzed each individual exceedance to identify that it was the result of a modeling anomaly?

WITNESS NADER-TEHRANI: As an example -- we

have a -- you know, tool that looks at, you know, the kind of water quality simulation. And you plot, say, what the objectives are versus the model results.

And so in a given month where the water quality standard is averaging X and you see the model results first half of month to be below that, second half is above that, then it gives me the indication that the model has the -- represent the correct volume of water that was dictated by CalSim II.

But it was -- what the DSM2 lacks is the day-to-day operation -- no, operator, you know -- that operators would have at their disposal in terms of reacting to a specific salinity intrusion event. DSM2 was not instructed in any way to react and adjust the flows as necessary. And so I -- I -- you know, and -- yeah, so that's basically it.

MS. NIKKEL: Thank you.

So as I understand your testimony and based on this analysis you've described, you would -- it's your opinion that all of the exceedances are due to modeling anomalies?

WITNESS NADER-TEHRANI: I would say most.

MS. NIKKEL: And did you conduct an analysis of those that are not due to modeling anomalies to determine what they are caused by?

WITNESS MUNEVAR: No, I didn't.

MS. NIKKEL: Final area of questioning. I'd like to focus on the North Delta contract.

If we could go to page 20 of DWR-79.

At line 20, you testify regarding the content and interpretation of the North Delta agreement starting with the word "furthermore."

WITNESS NADER-TEHRANI: Yes, I see that.

MS. NIKKEL: In that sentence, are you relying on the testimony of Ms. Sergent in reaching your conclusion?

WITNESS NADER-TEHRANI: That's correct.

MS. NIKKEL: So you don't have independent knowledge or opinions regarding the contents or interpretation of the contract; is that correct?

WITNESS NADER-TEHRANI: No, I don't.

MS. NIKKEL: So I'd like to move to page -- line 10. You see it there.

In this paragraph, you describe the MBK analysis that you discussed yesterday. As I understand it, you concede that petitioners' modeling shows that water quality requirements of the North Delta contract will be violated more frequently under California WaterFix operations; is that correct?

WITNESS NADER-TEHRANI: I believe I did give

specific numbers.

MS. NIKKEL: Thank you.

As I read your written testimony here, I understand that you relied on the analysis performed by MBK for purposes of this testimony. But yesterday I think I heard you -- and I want to be sure I understand -- that you conducted a similar analysis; is that correct?

WITNESS NADER-TEHRANI: That's correct.

MS. NIKKEL: Can you please describe what that analysis was that you conducted independent of the MBK analysis?

WITNESS NADER-TEHRANI: Basically trying to emulate what the North Delta Water Agency contract water quality objectives are and then basically counted. This is the work I've directed our DWR staff to do.

And we basically, under -- in relationship to Three Mile Slough, we counted the number of days that under -- Alternative 4A H3 Plus, there are additional days of exceedance. And according to what my staff reported to me, there were 18 days. And you have here 20 days, so I'm not going to argue over those two days.

MS. NIKKEL: Approximately when did you conduct that analysis?

WITNESS NADER-TEHRANI: I don't remember.

MS. NIKKEL: Was it two years ago? Last month?

WITNESS NADER-TEHRANI: No, no. Two months ago?

MS. NIKKEL: So after the last time you testified; is that correct?

WITNESS NADER-TEHRANI: It was -- it might have been longer than that. My memory -- I don't know whether it was two months, four months. But it was after -- after my testimony back last year.

MS. NIKKEL: Did you bring any documents today that reflect that analysis?

WITNESS NADER-TEHRANI: No, I did not.

MS. NIKKEL: Did you share that analysis with Ms. Sergent?

WITNESS NADER-TEHRANI: I did share a number of, you know, water quality results. I don't remember specifically whether I -- I may have verbally explained it to her. But I don't remember specifically whether I showed graphical representation or, you know, in written form.

MS. NIKKEL: But that analysis is something different than the analysis that was presented in DWR-901, correct?

WITNESS NADER-TEHRANI: DWR-901 only looks at

long-term monthly averages. It does not include water exceedance of the North Delta Water Agency water quality objectives.

The second analysis I was referring to is actually in relationship to the North Delta Water Agency water quality objectives. And, yes, we do have a tool in-house that would look at that.

MS. NIKKEL: I think I just heard something new. You have a tool that would look at that. What is that tool?

WITNESS NADER-TEHRANI: It's basically a spreadsheet.

MS. NIKKEL: And have you brought that spreadsheet here today?

WITNESS NADER-TEHRANI: No, I didn't.

MS. NIKKEL: Has it been offered in this proceeding?

WITNESS NADER-TEHRANI: No. It is a tool that has not been totally verified and so, therefore -- but because of the fact that we got numbers that were close to what the numbers I got based on North Delta Water Agency, I believe that they're accurate.

MS. NIKKEL: Are your conclusions in the paragraph starting at line 9, page 20, of your testimony based on that analysis that you conducted using the

spreadsheet?

WITNESS NADER-TEHRANI: I was basically relying on the North Delta Water Agency report to arrive at that express -- the lines that I've written here.

It's directly from that exhibit, North Delta Water Agency exhibit. I forget the exhibit number. I think you know.

MS. NIKKEL: I think you referred to it.

If I could just have a minute. I don't want to leave this topic that's somewhat new before I look at some other parts of my notes.

Okay. I'd like to focus on DWR-901. But before I do, other than the analysis that we've just talked about using the spreadsheet tool, did you conduct any other independent analyses of the California WaterFix operation's ability to comply with the North Delta contract?

WITNESS NADER-TEHRANI: I also relied on my general knowledge of the water quality in the Delta, and I think I explained some of that.

MS. NIKKEL: Okay.

WITNESS NADER-TEHRANI: I can explain, if you like.

MS. NIKKEL: No, thank you. I just wanted to know if there was any other specific analysis that we

should be aware of.

CO-HEARING OFFICER DODUC: You were very quick to say, "No, thank you" there, Ms. Nikkel.

MS. NIKKEL: I'm looking out for the efficiency of the proceeding.

CO-HEARING OFFICER DODUC: I appreciate it.

MS. NIKKEL: Mr. Baker, if we could now turn to DWR-901.

Mr. -- excuse me, Dr. Nader-Tehrani, I believe Ms. Sergent testified that you prepared these figures; is that correct?

WITNESS NADER-TEHRANI: My staff.

MS. NIKKEL: At your direction?

WITNESS NADER-TEHRANI: At my direction, yes.

MS. NIKKEL: And you also explained that these figures are showing monthly averages, correct?

WITNESS NADER-TEHRANI: That's correct, long-term monthly averages.

MS. NIKKEL: And so this analysis is not based on the 14-day running average that is specified in the 1981 contract, correct?

WITNESS NADER-TEHRANI: That is correct.

MS. NIKKEL: And this analysis -- excuse me -- does not attempt to account for the contract criteria in the North Delta contract that vary year to year based on

hydrologic conditions?

WITNESS NADER-TEHRANI: The pictures shown in this particular exhibit does not.

MS. NIKKEL: Thank you.

Ms. Sergent also testified that she conducted a -- what I was thinking of as a historical analysis of whether increases in EC shown on these charts in 901 would have resulted in a violation of the North Delta contract.

Are you familiar with that analysis?

WITNESS NADER-TEHRANI: I'm not.

MS. NIKKEL: So, you did not -- you were not the person who assisted her in that analysis?

WITNESS NADER-TEHRANI: No.

MS. NIKKEL: Do you know who was?

WITNESS NADER-TEHRANI: I don't.

MS. NIKKEL: Did you conduct any analysis of whether the increases in EC that are reflected in the Exhibit DWR-901 would result in exceedances of the North Delta contract?

WITNESS NADER-TEHRANI: Can you show me the specific figure that you're referring to?

MS. NIKKEL: Sure. Let's actually go to page 3. And we're looking at the compliance location at Three Mile Slough. I think it's the last page, maybe

page 4. Thank you. Yep.

So I'll ask my question again now specific to the modeling results that we see in the Three Mile Slough figure. Did you conduct any quantitative analysis of whether the increases in EC that are shown in this figure would result in additional violations of the North Delta contract?

WITNESS NADER-TEHRANI: Can you specify which increases you're referring to, please?

MS. NIKKEL: Before I do -- and I do want to go into the specifics -- I'd like to know if you conducted any analysis at all related to compliance with the North Delta contract and the modeling results, not just exceedances, but the modeling results that are shown on this figure?

WITNESS NADER-TEHRANI: The analysis that we did at DWR was basically using the alternative 4A H3 Plus. However, in my testimony, I also mentioned that given the fact that H3, H4 are so close, my -- it is my opinion that the same analysis that was held for H3 Plus, would apply in general sense to H3 and H4. I did not do a separate analysis for Boundary 1 or Boundary 2.

And for Boundary 2, given the fact that the water quality results show lower EC, practically most

months were similar, I would expect no additional days of exceedance beyond the no-action.

MS. NIKKEL: Okay. I think I understand what you're saying. Thank you.

Now, let's do focus on the specifics of this figure.

Let's look at September. And in September, the model results show that under Boundary 1 there would be an exceedance of -- or there would be additional EC. And yesterday you offered some testimony regarding your opinions about Boundary 1, and I just want to understand that better --

WITNESS NADER-TEHRANI: Sure.

MS. NIKKEL: -- specific to September in this figure.

Is it your understanding that Boundary 1 is a scenario offered by the petitioners in this proceeding to reflect the range of potential impacts of the project; is that right?

WITNESS NADER-TEHRANI: In general, yes. Uh-huh.

MS. NIKKEL: So the increases in EC that are shown here in September for Three Mile Slough are within the potential impacts of the proposed project, right?

WITNESS NADER-TEHRANI: I think I went in

great length yesterday to explain that Boundary 1 would represent the kind of future assuming fall X2 would no longer -- is no longer an operational criteria.

As such, I was explaining it would be, if you're looking at water quality in the fall of a wet and above normal year, you would have to consider if you're comparing the results to a no-action alternative that does include fall X2, that that's the reason for those increases, is that the fall X2 is not being included. And it's not related to the North Delta diversions.

MS. NIKKEL: Thank you. I understand that's your testimony.

Are you familiar with the testimony offered in this proceeding by Jennifer Pierre?

WITNESS NADER-TEHRANI: I vaguely remember it, yeah.

MS. NIKKEL: Would it be useful to refresh your recollection by pulling up her written testimony at DWR-51, please. We could go to page 13 at lines 22 through 26.

In the last sentence of that paragraph, it says that "The fall X2 is an area of active investigation in a multi-agency collaborative group, and its future implementation might be adjusted based on the outcome of those investigations. So this scenario

excluded it from Boundary 1."

So as I understand this testimony, it's possible that fall X2 could be changed or reduced?

WITNESS NADER-TEHRANI: That's what that sentence says, yes.

MS. NIKKEL: Thank you. I have no further questions.

CO-HEARING OFFICER DODUC: Thank you, Ms. Nikkel.

At this time, why don't we take a break until 2:45. And when we resume, Mr. Jackson, I'm sure, will sizzle us with his illuminative cross-examination.

(Off the record at 2:33 p.m. and back on the record at 2:46 p.m.)

CO-HEARING OFFICER DODUC: We are back in session.

Before we turn to Mr. Jackson and Mr. Shutes for their cross-examination, I need to do a shout-out to Group 22.

Ms. Taber, hopefully you're listening or someone will get this message to you. According to Mr. Ochenduszko's note, I've asked him to keep track of questions that have been asked during cross-examinations that have been deferred to this -- well, this portion of Panel 2.

And, Ms. Taber, in your cross-examination, you had a question regarding the limits of boundary analysis in DWR-652, Figure 14. That was deferred to -- to the modelers. However, Ms. Taber, you did not request time to conduct cross-examination.

So the shout-out to you, Ms. Taber, if you still need to have this question answered, let us know regarding your interest in cross-examining this panel.

With that, Mr. Jackson, Mr. Shutes, an outline of the topics you'll be covering.

MR. JACKSON: Yes. Michael Jackson, representing the California Sportfishing Protection Alliance, the California Water Impact Network, and AquAlliance.

Mr. Shutes and I are going to divide the time. It was not additive, so our estimate had been 45 minutes to an hour, and we'll divide that.

Mr. Shutes will go first, and he will take Mr. Leahigh. Then he has some questions for Mr. -- Munevar?

WITNESS MUNEVAR: Good enough.

MR. JACKSON: Would you tell me so I can get it right.

WITNESS MUNEVAR: Munevar.

MR. JACKSON: Munevar.

CO-HEARING OFFICER DODUC: We're going to slip one of these days and call you Mr. Whenever.

MR. JACKSON: And then I will have some -- I will have some questions. The remaining questions will be addressed to Mr. Munevar. And then -- I might have one for Ms. Parker. And I will have none for Dr. Nader-Tehrani.

CO-HEARING OFFICER DODUC: That, however, does not give me any idea in terms of the issues you'll be exploring.

MR. SHUTES: This is Chris Shutes representing California Sportfishing Protection Alliance. The issues I will be covering with Mr. Leahigh are DWR policy and its application. And with Mr. Munevar, the goals of California WaterFix as he understands them and risk tolerance.

MR. JACKSON: My questions, many of which were eliminated by other cross, will have to do with the San Luis rule curve; the use of joint point of diversion, much reduced by previous questions; the boundary analysis; the EI ratio; and some questions that have to do with the comments in regard to what MBK did in regard to their modeling and contrasting or comparative thing with the work done by the modeling team for the projects.

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CROSS-EXAMINATION

MR. SHUTES: The first question will be for Mr. Leahigh.

Mr. Baker, can you pull up DWR-10, Slide 11, please? That's Mr. Leahigh's PowerPoint.

Good afternoon, Mr. Leahigh. On Slide 11, you state that petitioners modeling for WaterFix shows decreased reliance on stored releases and that this is consistent with DWR policy; is that correct?

WITNESS LEAHIGH: Yes, that's correct.

MR. SHUTES: Yesterday you told Mr. Cooper that this policy exists in written form in a report to State Water Contractors. Did I get that right?

WITNESS LEAHIGH: Yes. So the basic strategy on balancing the needs for the current -- using storage in Lake Oroville for the current year's allocation versus preparing for potentially drought year, those -- that policy -- will also refer to as guidelines, yes.

MR. SHUTES: So could you identify that report? What's the name of it?

WITNESS LEAHIGH: Well, this will be our monthly water operations report to State Water Contractors.

MR. SHUTES: And is that report publicly

available?

WITNESS LEAHIGH: I'm not sure.

MR. SHUTES: Is it stated as a general policy document for a long term, or is it stated simply as what you're planning to do in any given month?

WITNESS LEAHIGH: It's a -- it's a guideline for any particular year.

MR. SHUTES: And it's renewed monthly?

WITNESS LEAHIGH: No. The -- the same guidelines would apply for any particular year regardless of the month.

MR. SHUTES: Would you have any objection to producing one of these reports so that we could look and see what it looks like?

WITNESS LEAHIGH: Yes, I think that is possible.

MR. SHUTES: I'd like to request that that be -- that the witness produce one of these reports so that we can evaluate what the policy actually is on a written basis and potentially the opportunity to ask questions regarding it.

CO-HEARING OFFICER DODUC: Mr. Mizell?

MR. MIZELL: We will find a copy of the report and bring it. However, I think he can ask as many questions as is appropriate based on the statement on

the slide and the written testimony that Mr. Leahigh has provided.

CO-HEARING OFFICER DODUC: If you do need -- if some follow-up is needed, I would request that you provide that document before we resume next Tuesday so that we may not -- so that we don't have to recall these witnesses after they've concluded with their testimony and cross-examination.

So, in other words, if additional follow-ups are necessary by Mr. Shutes and Mr. Jackson, I would like to have it done as part of the cross-examination of this panel.

MR. MIZELL: I understand.

MR. SHUTES: Mr. Leahigh, this report does not have explicit enforceable requirements in it, does it?

WITNESS LEAHIGH: No. These are water supply guidelines.

MR. SHUTES: And other than this report, the DWR policy you mentioned in your testimony -- in your rebuttal testimony is not a written policy; is that correct?

WITNESS LEAHIGH: No, it's not written policy.

MR. SHUTES: Sorry. The answer was there is no other written policy?

WITNESS LEAHIGH: There is no other written

policy, correct.

MR. SHUTES: Thank you.

Turn to Slide 14 of the same document, please.

Mr. Leahigh, in that slide, you say that after the biological opinions in 2008 and to the present, there were less opportunities to export what you call excess flows; is that correct?

WITNESS LEAHIGH: Yes, that's correct.

MR. SHUTES: Could we turn to Slide 15, please?

Doesn't this slide show that DWR increased reliance on stored water for exports after the biological opinions were implemented?

WITNESS LEAHIGH: Yes. That was the whole point of this slide.

MR. SHUTES: Was this increased reliance on stored water for exports inconsistent with DWR policy?

WITNESS LEAHIGH: No, it was not.

MR. SHUTES: So would you say the policy changed based on circumstances after the implementation of the biological opinions?

WITNESS LEAHIGH: No. It's entirely consistent, and I can explain why.

The effect of the biological opinions were to reduce the delivery capabilities of the project. And as

I've described this -- these guidelines, it's a sliding scale associated with the actual allocation. So the higher the allocation, the less water we would pull from storage. And the converse is true as well. The lower the allocation, the more we would draw on storage from upstream.

So the effect of the biological opinions on decreasing our ability to capture excess flows in the winter and the spring, which would go towards the SWP allocation because it resulted in dropping the allocation, the project became more dependent upon the stored water.

And so my point was WaterFix would take us back, restore back to that previous operating regime where we would be able to capture with the North Delta diversion, perhaps be able to capture more of these excess flows once again, thereby increasing SWP allocation and making the project, again, following the same guidelines, less dependent upon the stored water for their allocation purposes.

MR. SHUTES: Could we bring up Mr. Leahigh's rebuttal testimony, DWR-78, page 7, please?

And referring to lines 6 and 7, basically this states what you just told us. The project balances the needs of current year with the risks for meeting the

many requirements and beneficial purposes of stored and subsequent use; is that fair?

WITNESS LEAHIGH: That's what I've written here.

MR. SHUTES: So the policy you're referring to really is a question of how you balance exports and storage; is that correct?

WITNESS LEAHIGH: That's correct. It's this trade-off release of storage for the current year which puts some risk on the dry year supply and a subsequent year.

MR. SHUTES: So could we go back to DWR-10, the PowerPoint, please, and Slide 14?

This slide says you will have greater flexibility and opportunity to capture excess flows as a substitute for stored water; is that correct?

WITNESS LEAHIGH: That's correct.

MR. SHUTES: Could we bring up CSPA Exhibit 36, please? And start with Slide 1.

So this reminds us where this material came from. It's from the RD EIR/SD EIS.

And could we go to Slide 2 now, please?

So looking at Bullet 2, this predicts increase north of Delta -- demands on CVP and the SWP of 443,000 acre feet per year when you compare the existing

condition and the no-action alternative.

Do you see that?

WITNESS LEAHIGH: Second bullet?

MR. SHUTES: Second bullet.

WITNESS LEAHIGH: I see it.

MR. SHUTES: And given your understanding of the system and what's stated in this bullet, is it fair to say most of the predicted increase in north of Delta demands are not -- you will not be able to meet that -- or the projects will not be able to meet with increases in excess -- in use of excess water? Talking about north of Delta demands.

WITNESS LEAHIGH: It would depend on the timing of those demands.

MR. SHUTES: Given what you know about the timing.

MR. MIZELL: Objection. Speculative. Would depend on the hydrology of the year as well as climate change and how that plays out.

CO-HEARING OFFICER DODUC: Mr. Shutes?

MR. SHUTES: Yes.

CO-HEARING OFFICER DODUC: Would you like to narrow the focus of your question?

MR. SHUTES: Are there significant times during various water years in which new north of Delta

demand will not be -- you will need to meet them with stored water?

MR. BERLINER: Objection. Vague as to use of the word "significant." Hasn't been defined.

MR. SHUTES: Are there any?

WITNESS LEAHIGH: Are there any what?

MR. SHUTES: Are there any circumstances in which this new north of Delta demand that your document predicts will need to be met with stored water and not excess water?

WITNESS LEAHIGH: I don't know.

MR. SHUTES: Looking at Bullet 3, Bullet 3 predicts an increase in up to 25 percent of State Water Project south of Delta demand; is that correct?

WITNESS LEAHIGH: Are you asking me is that correct what that states?

MR. SHUTES: Is it correct that that's what this document states?

WITNESS LEAHIGH: That's what this document states that I'm looking at.

MR. SHUTES: Thank you. Okay.

And turning to Slide 3, please, for the same document.

This slide suggests that end of September storage in Oroville on average will be 440,000 acre feet

less under the no-action alternative as compared to existing conditions; is that correct?

I'll give you a minute to read it.

CO-HEARING OFFICER DODUC: Do you want to correct that, Mr. Berliner?

MR. BERLINER: Well, it says 430.

MR. SHUTES: Excuse me. 430. He's correct.

MR. BERLINER: My objection is the vagueness of this question. Are you asking what the document says, or are you asking Mr. Leahigh to agree or disagree with --

MR. SHUTES: I'm asking what the document says.

MR. BERLINER: The document speaks for itself.

CO-HEARING OFFICER DODUC: Then let Mr. Leahigh answer.

WITNESS LEAHIGH: That sounds like a good answer.

MR. SHUTES: Okay. So there's a predicted loss of Oroville end of September storage in the no-action alternative as compared to the existing condition.

Will be it DWR policy to use the California WaterFix facilities to allow DWR to make up loss of stored water between what will occur in the no-action

alternative as compared to existing conditions?

MR. BERLINER: Objection. Calls for speculation as to future DWR policy.

CO-HEARING OFFICER DODUC: Hold on. Stop. Hold on to that thought, Mr. Berliner. My counsel is even more detail-oriented than I am.

Mr. Shutes, going back to your question to Mr. Leahigh regarding confirming this language, are you asking him to confirm the language as it is shown on CSPA-36 or are you asking him to confirm this is indeed the language from the RD EIR/SD EIS?

MR. SHUTES: I'm asking him to confirm whether that's what it shows.

CO-HEARING OFFICER DODUC: That's what your slide shows, or is that the language in the RD EIR/SD EIS?

MR. SHUTES: This exhibit was submitted and accepted into evidence in a previous phase of this proceeding, and I didn't think that the authenticity of it was in question. And so what I'm asking is simply what, on its face, the document says.

CO-HEARING OFFICER DODUC: Is that satisfactory, Ms. Heinrich?

MS. HEINRICH: I guess if you're just asking the witness to confirm that you're accurately

summarizing what's on the slide, assuming that what's on the slide is correct.

MR. SHUTES: Okay. I'm trying to establish foundation for my series of questions, and I'm done with that and I'm going to ask the questions.

MR. BERLINER: If I could interject because my understanding is the witness has answered questions that say, for example, that CSPA-36, page 3, has a sentence on it. That says that Lake Oroville storage would decrease by 430,000 acre feet. And that's the only thing he's answering.

CO-HEARING OFFICER DODUC: Why don't we let Mr. Shutes continue, and hopefully this will all make sense.

MR. SHUTES: My question was -- will it be -- and it goes to what DWR policy is because we don't have a document that says what it is; we have what Mr. Leahigh has represented in his testimony.

And I'm trying to compare it to actual events, not just possible events, but events that are predicted in the Department of Water Resources and Bureau of Reclamation's environmental document. So it's not some hypothetical; it is what they say the impacts are going to be.

And, again, the question is: Will it be DWR

policy to use California WaterFix facilities to allow DWR to make up the loss of stored water between what will occur in the no-action alternative as compared to existing conditions?

MR. MIZELL: I'm going to object to this question as being vague. He hasn't identified what alternative and operational scenario this slide is referring to. For all we know, it could be one of the alternatives in EIR/EIS, which is not the petitioned project and, therefore, is irrelevant and beyond the scope of this witness's testimony.

MR. SHUTES: Excuse me. I didn't ask about any particular scenario. I asked about the no-action alternative and existing conditions as they were presented in your EIR. I didn't ask about --

CO-HEARING OFFICER DODUC: Okay. Mr. Shutes. Mr. Shutes, help me understand. You're looking at the no-action alternative as modeled by petitioner?

MR. SHUTES: Correct.

CO-HEARING OFFICER DODUC: And then you're looking at --

MR. SHUTES: Existing conditions as modeled by petitioners. In their ERI --

CO-HEARING OFFICER DODUC: Stop. Stop. What's -- okay. So the no-action alternative --

MR. SHUTES: And existing conditions.

CO-HEARING OFFICER DODUC: And existing conditions. Okay.

MR. SHUTES: They are different.

CO-HEARING OFFICER DODUC: And your question is?

MR. SHUTES: My question is: Will DWR policy be to restore some of the loss of the storage that was lost or that will be lost under the no-action alternative as compared to existing conditions using CWF facilities?

CO-HEARING OFFICER DODUC: Are you able to answer, Mr. Leahigh?

WITNESS LEAHIGH: The question doesn't really make sense to me. So, no. Yeah.

And, quite frankly, this is the first I've seen this and it's out of context. I -- I don't understand the question. It doesn't really make sense.

MR. SHUTES: You've got a difference of 440,000 acre feet in end of September storage in Oroville simply because of climate change and sea level rise and potential increases in north of Delta deliveries and other factors that you've included in your no-action alternative as compared to existing conditions.

I want to know if you're going to -- if you're going to try to get back to that 444,000 acre feet of north -- of storage in Oroville using the flexibility that's provided to you by the California WaterFix facilities. I want to know what your target is.

WITNESS LEAHIGH: The California WaterFix facilities are not going to create storage. So that's why I'm a little confused with your question.

Certainly climate change is -- as you mentioned, is undoubtedly part of the reason for this. I don't know about the other factors you mentioned. Certainly not the increased diversions from the North Delta diversion, because I testified directly opposite of that. To the extent that there's less storage in, like, Oroville, there would be less opportunity for SWP project supplies.

MR. SHUTES: All right. Let's move on and sort of get to the -- to the point here.

Will DWR policy be, if California WaterFix is implemented, be to maintain end of September storage in Oroville equal to, less than, or greater than end of September storage under existing conditions?

MR. MIZELL: I'm going to object as being beyond the rebuttal testimony. His rebuttal testimony makes comparisons between the project alternatives and

the no-action alternative. And this question is about the existing conditions comparison, which is beyond the scope of Mr. Leahigh's testimony.

MR. SHUTES: Mr. Leahigh's testimony goes to policy. And we don't have a written document to evaluate that policy, and I'm trying to understand what the policy is.

CO-HEARING OFFICER DODUC: That's a valid point, Mr. Shutes. I'll give you some leeway on that.

Overruled, Mr. Mizell.

WITNESS LEAHIGH: So I do not anticipate any change in the guidelines that we've been discussing. So in order -- if there's a less -- if there's less inflows into the system as a result of climate change or whatever else, in order to maintain the same carryover storages in our policy, we would have to release less water for our own contractors in order to achieve those same storages.

MR. SHUTES: Will it be DWR policy for State Water Project operations under the California WaterFix to meet any of the predicted increase in south of Delta demands by increasing export for stored water?

WITNESS LEAHIGH: So the current requests from State Water Project Contractors are essentially the full Table A contract volumes, even today. So there's --

there's no chance that those would be increased above the Table A amount.

MR. SHUTES: So what are the predicted north -- south of Delta -- is it in this slide or the previous one? -- increases that are referenced in your document?

Would you go back to the previous slide, please?

Third bullet. 25 percent. Second -- third -- fourth to the last line starting with: "This represents a potential 25 percent increase on average in south of Delta demands."

So you're saying that -- please explain your last answer in that context.

WITNESS LEAHIGH: Well, so I didn't prepare this document. All I can tell you is what I know. And what I know is that the current requests from our -- SWP contractors is the full Table A demand.

MR. SHUTES: Could we look at Mr. Leahigh's testimony, slide -- page 10, please. It's DWR-78; is that correct?

So let's look at lines 9 through 11. It says that some of the preexisting ability to export excess flow would be restored with CWF, correct?

WITNESS LEAHIGH: Correct.

MR. SHUTES: And you will have a return of flexibility that will make you less reliant on upstream storage, correct?

WITNESS LEAHIGH: Correct.

MR. SHUTES: Does that mean that you will actually use less upstream storage to meet project demand, particularly south of Delta, or is it just a statement of flexibility?

WITNESS LEAHIGH: No. It's a statement that adheres to the guidelines that we've been discussing. To the extent that we have an ability to export additional spring flows thereby resulting in an increase in the SWP allocation, our guidelines would suggest that we would then retain more water upstream for the following year with that increase in SWP allocation afforded by the increased exported -- export of excess flows.

MR. SHUTES: All right. Could we look at DWR-10, Slide 4, please? I'm almost done with this witness.

You say in the second bullet that additional storage, if any, is used for project purposes following year. I guess that means "the" following year.

Does this additional storage refer to south of Delta storage, north of Delta storage, or both?

WITNESS LEAHIGH: Which slide are we looking at?

MR. SHUTES: Bottom bullet: "Additional storage, if any, used for project purposes following year."

WITNESS LEAHIGH: Okay. There was a different slide up earlier.

MR. SHUTES: Sorry.

WITNESS LEAHIGH: This was in reference to San Luis Reservoir storage. So to the extent that we ended up exporting more than our conservative assumption that's used for the allocations for that particular year, because they are conservative, they're -- our ability to export will be exceeded most of the time in that conservative estimate. And that additional export that would occur that summer would not go to that year's allocation but would be stored in San Luis Reservoir. And so that would be a head start on to supply as a allocation for the following year. So this was in reference to San Luis Reservoir storage.

MR. SHUTES: South of Delta?

WITNESS LEAHIGH: South of Delta.

MR. SHUTES: Thank you. That's all I have for this witness.

And much of my questions for Mr. Munevar were

already asked, so I will try to keep it brief.

I'd like you to look at Mr. Munevar's rebuttal testimony. And that is DWR-86, page 14, lines 9 through 20, please.

Good afternoon, Mr. Munevar.

WITNESS MUNEVAR: Good afternoon.

MR. SHUTES: In the passage above there from lines 9 through 20, those two paragraphs, you describe the existing San Luis rule curve as being unreasonable for application under California WaterFix modeling scenarios; is that correct?

WITNESS MUNEVAR: I think the statement's relating to MBK's nonadjustment of the rule curve associated with WaterFix.

MR. SHUTES: Very well.

How do you know that the projects under California WaterFix would prioritize upstream storage flexibility over increased exports?

WITNESS MUNEVAR: I think the WaterFix in and of itself affords that flexibility. And through discussions with operators, the modeling confirms their operational behavior.

MR. SHUTES: So you base that on your discussions with operators; you weren't give a document that said this is how you should model this. Is that

right?

WITNESS MUNEVAR: That is correct.

MR. SHUTES: Okay. Specifically on pages -- on lines 19 and 20, you state that MBK overshadowed the additional goals of CWF to maintain upstream storage flexibility; is that correct?

WITNESS MUNEVAR: The statement is that their prioritization of moving stored upstream water was in contrast to what we understand the operational behavior to have operational flexibility upstream.

MR. SHUTES: It states explicitly, does it not in line 19, that their prioritization overshadows the additional goals of California WaterFix to maintain upstream storage flexibility, does it not?

WITNESS MUNEVAR: That is what it says, yes.

MR. SHUTES: Okay. Good.

You're saying maintaining upstream storage flexibility is a goal of California WaterFix?

WITNESS MUNEVAR: Was that a question?

MR. SHUTES: Yes.

WITNESS MUNEVAR: That is one of the objectives, I think, in terms of at least operational behavior associated with the WaterFix implementation.

MR. SHUTES: Okay. Is it increasing exports also a goal of California WaterFix?

WITNESS MUNEVAR: To the extent that that export can be met through the additional flexibility of the North Delta intakes.

MR. SHUTES: Does restoring exporting to a level prior to 2008 a goal of California WaterFix?

WITNESS MUNEVAR: There is no -- there is no target in the modeling of what export levels to achieve.

MR. SHUTES: Can we please turn to Mr. Munevar's rebuttal testimony on page 46, lines 11 to 22?

WITNESS MUNEVAR: Could you restate what lines you're referring to?

MR. SHUTES: Lines 11 through 22, the discussion of your rebuttal of the statement regarding treating reservoir storage as a variable, not a constant. I'd like to call your attention specifically to the phrase "risk tolerance" in line 20.

Do existing regulatory requirements contain a defined risk tolerance for State Water Project and Central Valley Project operations?

WITNESS MUNEVAR: The regulatory requirements do not.

MR. SHUTES: Okay.

WITNESS MUNEVAR: As I understand.

MR. SHUTES: That's why I asked.

WITNESS MUNEVAR: In terms of regulatory requirements.

MR. SHUTES: Correct. But there is a risk tolerance embedded in the no-action alternative, CalSim II model run?

WITNESS MUNEVAR: If I can continue. I wasn't quite done with the previous answer.

For the biological opinion in terms of attempting to achieve Shasta storages, there are specified levels of desirable storage levels at certain levels of exceedance. And whether that's regulatory or biological opinion, I don't know how to classify that, but -- so I would put that in that category.

MR. SHUTES: So my question is: Didn't you decrease the risk tolerance in modifying the San Luis rule curve in the California WaterFix alternatives that you presented?

WITNESS MUNEVAR: No. The way -- no, I don't think that is the case. The way I would describe it is the ability to -- to export water at the time of that water being available is an improvement in the operation. And what we evaluate is did we increase the risk upstream and the reservoir.

So what we had shown in the previous testimony was that, by and large, the reservoir levels have

similar risk or probabilities of exceedance with no-action as with the WaterFix.

MR. SHUTES: Doesn't the change in the San Luis rule curve actually reduce the risk tolerance?

WITNESS MUNEVAR: No, I -- no, it does not. It merely responds to the availability of supply and the ability to export that supply. The San Luis rule curve is attempting to marry up the timing of availability of supply with the timing of moving that water across the Delta and into San Luis storage.

So under the biological opinion, for example, there has to be a movement of water outside of March/April/May largely because of their being severely restrictive in exports. The WaterFix does not necessarily have the same level of restriction during those same months.

MR. SHUTES: I understand.

Okay. Referring again to the paragraph above that we were looking at, is it your opinion that the reservoir operations of petitioners' model in the California WaterFix alternative are the only reasonable reservoir operations for the California WaterFix?

WITNESS MUNEVAR: I think they're our best representation based on our understanding of operational behavior.

MR. SHUTES: I didn't ask that. I asked if it was the only reasonable operation.

WITNESS MUNEVAR: Well, then I can't answer that.

MR. SHUTES: All right. Thank you. That's all.

CO-HEARING OFFICER DODUC: Mr. Jackson, you're up.

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CROSS-EXAMINATION

MR. JACKSON: Mr. Munevar, you saw the slide that indicates that there's going to be a substantial drop in storage between the existing condition in Lake Oroville and the no-action alternative and, therefore, every other alternatives? You saw that slide?

WITNESS MUNEVAR: I did see a slide.

MR. JACKSON: Is there any way that you can pick up water to solve that deficit from below Lake Oroville?

WITNESS MUNEVAR: So my understanding is most of that impact, that drop in storage that you're referring to, is associated with the climate change between -- which was not in place in the existing scenario which is in place in the no-action.

Some of that is changes in flows into Lake Oroville; but, by and large, it's changes in flows downstream of Lake Oroville.

MR. JACKSON: What information did you use to model the changes above Lake Oroville?

WITNESS MUNEVAR: So the changes in flows between the existing and no-action?

MR. JACKSON: Yes.

WITNESS MUNEVAR: We ran hydrologic modeling with alternative climate futures and characterized the exchanges in flows with the historic climate and then compared that to changes in simulated flows with future climate change, our Q5 scenario.

MR. JACKSON: Did you get information from Pacific Gas & Electric about conditions up above and -- to determine the actual flows that are -- that have declined since you built your reservoir?

MR. MIZELL: I'm going to object to this question and anything else that delves further into what might have been done. Based upon scenarios that are already tangential to Mr. Munevar's testimony, we're now three or four degrees away from what he's actually testified about, and we're again seeing a pattern of using an answer to one question to launch into a new line of inquiry.

MR. JACKSON: Well, obviously the fact that the lake is receiving less inflow is reflected in the difference between -- in the biologic -- excuse me -- in the EIR/EIS which is the environmental document for this change petition.

And so I'm trying to decide -- I'm trying to find out from the expert whether or not the difference in -- in the water levels that they're projecting into the future can be fixed by the California WaterFix in the Delta.

CO-HEARING OFFICER DODUC: Because of their statement that the WaterFix provides them with additional flexibility?

MR. JACKSON: Yes.

CO-HEARING OFFICER DODUC: All right.

MR. MIZELL: The additional flexibility that was referred to in the testimony was based upon the North Delta intakes, not based upon reoperation of the upstream reservoirs, which is a point we've covered quite extensively in the cases in chief.

Mr. Jackson is attempting to go back to the case in chief and recross people on topics that are well beyond the rebuttal.

CO-HEARING OFFICER DODUC: Mr. Jackson, perhaps if you could be more direct in asking your

questions without referring to those upstream reservoirs, we might get some answers faster.

MR. JACKSON: Well, the question is basically to determine whether or not the California WaterFix actually grants flexibility anywhere above, you know, with both the state and federal contractors in the northern area. It's evidence that has been presented by the projects and indicates that there is -- the flexibility is not going to solve the storage problem, and so there really isn't any gain in flexibility for storage upstream.

CO-HEARING OFFICER DODUC: I'm not sure that their focus on flexibility is targeted in terms of increasing storage upstream.

Is that the question you're trying to get?

MR. JACKSON: I'm trying to figure out whether it would increase storage upstream in any given year.

CO-HEARING OFFICER DODUC: All right. Please answer that one question.

WITNESS MUNEVAR: I think most of the operational flexibility that both Mr. Leahigh and I were referring to was the timing of export flexibility. There may be some marginal flexibility associated with the upstream reservoirs, but because, as Mr. Leahigh testified, most of the SVP operations is picking up

unstored water, it is unlikely that that flexibility is significantly enhanced for Lake Oroville.

MR. JACKSON: Or, Ms. Parker, for Lake Shasta?

WITNESS PARKER: I believe the answer for CVP facilities north of the Delta is similar to that for the State Water Project. Again, the flexibility that is anticipated to enhance operator's ability to export water is the convenience afforded by the North Delta diversion. And as the difference between the no-action alternative and the WaterFix scenarios depict, it is not anticipated that that would result in significant differences to North Delta storage operations.

MR. JACKSON: And so, therefore, the increased flexibility of building the project is almost entirely a benefit to south of Delta exports; is that correct?

WITNESS PARKER: I believe that's the point of the project.

MR. JACKSON: Mr. Munevar, the same kind of line of questioning to get right to the point. The flexibility that is -- that you see from your modeling in the California WaterFix doesn't apply to anyone in the Delta, does it?

WITNESS MUNEVAR: At least my reference to operational flexibility was referencing the projects: The State Water Project and the Central Valley Project.

I had not really thought of it in terms of operational flexibility for those in the Delta.

Now that I'm thinking of it, from -- from a operational flexibility in terms of achieving the flows that are targeted in terms of the California WaterFix operations, it is likely to have increased benefit for achieving those flows as well.

MR. JACKSON: The increased benefit you are discussing takes into account the fact that as much as 2 1/2 million acre feet of water would be now be in a tunnel and not going through the Delta?

WITNESS MUNEVAR: Yes, it does.

MR. JACKSON: And that comes from Oroville or upstream reservoirs?

WITNESS MUNEVAR: Comes from the -- from the watershed, from Sacramento Valley watershed.

MR. JACKSON: Okay. Now, there are lots of people in the watershed with water rights, and let's take Oroville as an example.

When Oroville spills like it did pretty much all winter, or at least from January on, Oroville is generally managed by the -- its flood control regulations, correct?

WITNESS MUNEVAR: During flood control events, yes.

MR. JACKSON: Right. When that water is released, who does it belong to? In terms of your modeling.

MR. MIZELL: Objection. Calls for a legal conclusion. He's asking a modeler about the administration of water rights, and I would think that's something more appropriately addressed to the Water Board.

CO-HEARING OFFICER DODUC: He's asking how it's reflected in the modeling.

And if Mr. Munevar -- you know I have to stop whenever I say your name. If you do not know, then just say so.

WITNESS MUNEVAR: The ability for the project to -- SWP and CVP to export is governed by the coordinated operations agreement which both assigns relative obligation for big basin requirements as well as proportions of unstored water for export. To the extent that that spill becomes unstored water for export, there is a sharing of that between the SWP and CVP.

MR. JACKSON: Does your model take into account the sharing of it with -- with property owners, water rights holders in the Delta?

WITNESS MUNEVAR: Modeling accounts for all

in-Delta demands being satisfied.

MR. JACKSON: But doesn't increase the opportunity for water rights holders of the Delta to use extra water?

WITNESS MUNEVAR: It does not provide more than what we use in the model called our consumptive use estimate.

MR. JACKSON: Could we move to page 31 at line 13 through 16?

You indicate that there is -- in stressed water supply conditions, you indicate that CalSim II model shows instances where you can't meet the regs, right?

WITNESS MUNEVAR: I'll restate what I wrote here because I'm not sure what "regs" means. But that under some of those conditions and particularly under the climate change scenario -- that's where most of them are showing -- there can be instances where the water and storage is -- is already used for meeting regulatory requirements and senior water right holders, and there may not be sufficient supply to meet all of those to the fullest amount.

MR. JACKSON: So when you're in that situation, do you model reduced deliveries to south of Delta?

WITNESS MUNEVAR: When we are -- when we reach those conditions, there are generally no stored water releases for exports.

MR. JACKSON: That wasn't exactly the question.

The question was: When you reach a condition that you can't meet minimum instream flows, regulatory flow, and salinity requirements, or deliveries to senior water rights holders -- wherever they may be, but they're usually upstream -- do you -- does your model then cut delivery south of Delta?

WITNESS MUNEVAR: In general in those years, allocations are probably already at zero or very close to zero. The priority of the system would be to meet the instream flows and the senior water rights holders before exporting any water from storage even if there were an allocation higher than zero.

MR. JACKSON: Now, when you use the word "senior water rights holder," are you talking about in a -- in a contractual sense within the projects or are you talking about everybody who's senior to the projects or both?

WITNESS MUNEVAR: I believe I'm referring to senior to the projects.

MR. JACKSON: I have one more. Could we go to

page 25? First, lines 7 through 9.

You included a footnote in the "Delta Outflow Requirement" section that relates to what you call "Unsubstantiated assertions of Tom Cannon testifying for CSPA."

Do you see that?

WITNESS MUNEVAR: I do.

MR. JACKSON: Was it your understanding that Mr. Cannon was saying that there was not going to be an EI ratio, or was he talking about the petition which requests -- which requests moving the point where the EI ratio is determined in terms of inflow?

WITNESS MUNEVAR: I don't recall the specific statement from Mr. Cannon.

MR. JACKSON: Well, you recalled it enough to call it unsubstantiated.

MR. BERLINER: Objection. Argumentative.

MR. JACKSON: Yeah, it was. One of my many failings, I guess.

The -- in your modeling for the California WaterFix, does the movement of the point of -- of measurement of inflow allow the diversion at the North Delta not to be counted as inflow?

MR. MIZELL: Objection. Misstates testimony. We didn't propose the change of point of measurement of

inflow.

CO-HEARING OFFICER DODUC: I'm intrigued by this line of questioning. How is that proposed change reflected in the modeling? Is it reflected?

WITNESS MUNEVAR: I believe we presented this on direct. But it is the export that is being used in terms of the export inflow ratio is -- is the export -- South Delta export not inclusive of the North Delta export.

MR. JACKSON: And wasn't that the point Mr. Cannon was trying to make?

WITNESS MUNEVAR: There are two aspects of this. There is an export-inflow ratio that was part of D-1641 which was -- when there was only one point of diversion.

Then during the biological opinions, there was a San Joaquin inflow-export ratio. So what we have in the WaterFix now are essentially bypass flows at the North Delta diversion which we believe are protective of fish. And we have a San Joaquin I-E ratio and OMR requirements at the South Delta which were put in for fishery-based requirement.

MR. JACKSON: Well, without getting hit with the gavel, we're not supposed to be talking about fish. What I'm talking about is how does your -- and I'm right

at the end if this works.

How does your modeling take into account the fact that the -- the new design essentially makes what you divert no longer inflow? Is that how it works?

WITNESS MUNEVAR: I think that's what I was trying to -- trying to phrase. The North Delta bypass flows essentially --

MR. JACKSON: I'm not talking about bypass flows. I'm talking about inflow into the system, into the Delta.

WITNESS MUNEVAR: I can only answer the way I'm intending to answer so...

CO-HEARING OFFICER DODUC: Okay. Mr. Munevar -- you know, I can't say your name. Please go ahead and answer.

WITNESS MUNEVAR: The North Delta bypass flows essentially have a percent of river flow that can be diverted subject to a number of rules.

The South Delta diversion continues to have the E-I ratio as included in D-1641. In addition, it has a whole suite of additional requirements that limit the South Delta export. So, in combination, those tend to be more restrictive than the E-I ratio that was part of D-1641.

MR. JACKSON: Well, let me follow up on that a

little bit.

Essentially the E-I ratio that measures how much the South Delta pumps can take now includes all the flow coming in from the Sacramento, the American, the Trinity, the Feather, and is measured there as inflow. Now you're going to have two systems. One's going to go through Hood and will have the same E-I ratio to take care of pumping it to South Delta, but the south -- the Clifton Court becomes connected to these tunnels.

Is that water -- how is that water treated? Is it inflow?

WITNESS MUNEVAR: The point of measurement of inflow is unchanged from the current operation.

The export that's in the California WaterFix that's part of the E-I ratio is the diversion from South Delta channels into Clifton Court or modified version thereof. Does not include the diversions from the North Delta because they are part of the -- essentially it is the point upstream that represents inflow.

MR. JACKSON: So it is not part of the calculation?

WITNESS MUNEVAR: The North Delta diversion is not specifically part of the export term in the export-inflow ratio from 1641.

MR. JACKSON: Thank you very much. That's my last question.

CO-HEARING OFFICER DODUC: Thank you, Mr. Jackson, Mr. Shutes.

Mr. Jackson, even though I've been tempted, I've actually never hit anyone with the gavel.

MR. JACKSON: And I do apologize, I guess because I now get to go to my anniversary dinner. And I'm in a good mood. So you don't have to hit me with the gavel today.

CO-HEARING OFFICER DODUC: Why don't we stand up and stretch for a little bit. Take a short five-minute break. And then ask East Bay MUD to come up to conduct their cross-examination.

We'll continue on the 3:55.

(Off the record at 3:52 p.m. and back on the record at 3:57 p.m.)

CO-HEARING OFFICER DODUC: All right. Please take your seats.

MR. SALMON: My name is Jonathan Salmon. I'm from East Bay MUD, office of general counsel.

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CROSS-EXAMINATION

MR. SALMON: Good afternoon. I'm Jonathan Salmon. I'm with East Bay Municipal Utility District.

My questions are for Dr. Nader-Tehrani, and they pertain to his rebuttal of Dr. Ben Bray's testimony which concerned reverse flow impact at Freeport. I'm going to ask Dr. Nader-Tehrani about the following topics.

First, his calculation of the probability of significant reverse flow events in low-flow conditions.

Second, his critique of Dr. Bray's bias correction of the DSM2 model data.

Third, the manner in which Dr. Nader-Tehrani compared the results of the various modeled scenarios to support his conclusions.

Fourth, the exceedance curve that appears in his rebuttal of Dr. Bray.

I may have a few other miscellaneous questions, but I expect I can wrap up in perhaps 45 minutes and we can all go home.

Dr. Nader-Tehrani, first I'd like to ask you a few questions about your calculation of the likelihood of significant reverse flow events under certain low-flow conditions.

Could we please display Exhibit DWR-79, which is Dr. Nader-Tehrani's rebuttal testimony? I'd like to see page 13 and lines 8 through 15.

So this is a paragraph numbered paragraph 1.

It's states a percentage of probability of a significant reverse flow event occurring when flows are below 8,000 CFS at Freeport.

Dr. Nader-Tehrani, if you could review that paragraph.

WITNESS NADER-TEHRANI: Are you referring to the paragraph starting from line 8?

MR. SALMON: Yes.

WITNESS NADER-TEHRANI: Go ahead.

MR. SALMON: Dr. Nader-Tehrani, your testimony used the term "SRFE" to mean significant reverse flow event. Are you using that term in your rebuttal testimony in the same sense as Dr. Bray used it in his testimony to mean a reverse flow event in Freeport severe enough to require a shutdown of the Freeport project intake?

WITNESS NADER-TEHRANI: I used the definition as I understood it as a significant reverse flow event to mean having a flow event leading to an effective distance of about .9 miles as I understood from Dr. Bray's analysis.

MR. SALMON: Okay. In this portion of your testimony, you express an opinion that there is a 1 in 92 probability, or 1.1 percent, that there would be an SRFE when the average daily flow at Freeport drops below

8,000 CFS.

Looking again at that paragraph, did you calculate that percentage by dividing four SRFE events by 371 days? Is that how you got to 1.1 percent?

WITNESS NADER-TEHRANI: Yes, and that's correct.

MR. SALMON: So when you performed that calculation, did you assume that there were only four days on which SRFE events occurred during this time period? And that's the time period described in that paragraph.

WITNESS NADER-TEHRANI: I believe I was relying on the East Bay MUD witness, Eileen White.

MR. SALMON: Were you aware of the testimony of Eileen White, who is East Bay MUD's chief operator, in Part I-B of this hearing that there were actually eight SRFE-caused shutdown events of the Freeport project during this time period?

WITNESS NADER-TEHRANI: I'm -- no.

MR. SALMON: Were you aware that Ms. White testified that her count of eight shutdowns only occurred -- or only includes the SRFEs that occurred while East Bay MUD was operating the Freeport project intake during this period?

WITNESS NADER-TEHRANI: No.

MR. SALMON: Did you consider the possibility when you calculated this probability that East Bay MUD did not operate the Freeport project intake on a daily continuous basis between April 2014 and December 2015?

WITNESS NADER-TEHRANI: No, I did not.

MR. SALMON: Let's assume that East Bay MUD did not operate on a daily continuous basis during that period. Is it possible if you make that assumption that SRFEs occurred on days when the intake was not in operation that would have required the Freeport project to shut down had the project been operating?

WITNESS NADER-TEHRANI: I can't comment on that not knowing the exact nature of what -- how East Bay MUD operates its facility.

MR. SALMON: If each shutdown actually occurred during that period, for example, and not four, you would expect the probability of an SRFE to be higher than what you calculated, correct?

WITNESS NADER-TEHRANI: It would double that, 2.2 percent.

MR. SALMON: And so that would be equally true if even more than eight occurred, that it would increase in proportion with the number of SRFE events?

WITNESS NADER-TEHRANI: Again, I just want to make sure we are all understand this is very low-flow

period. And so I would expect the higher probability during a very low-flow period whereas in higher periods, you would expect a much lower probability, yes.

MR. SALMON: Understood. I'll ask you a bit about that a little later.

So you counted 371 days during this time period with average daily flows below 8,000 CFS at Freeport?

WITNESS NADER-TEHRANI: That's correct.

MR. SALMON: When you made that tally, did you look the daily gauge data for all days during that time period?

WITNESS NADER-TEHRANI: Again, this is something I asked my staff to do. And that was my instruction to them, yes.

MR. SALMON: Okay. As far as you're aware, that's what they did?

WITNESS NADER-TEHRANI: I asked them to look at the daily average flow at Freeport.

MR. SALMON: On all days during the entire time?

WITNESS NADER-TEHRANI: On all days during that time period, yes.

MR. SALMON: So, similarly, when you were choosing which days of gauge data to examine, you didn't

consider the possibility of any Freeport project downtime during that period, correct?

WITNESS NADER-TEHRANI: No, I did not.

MR. SALMON: When you did the probability calculation, you looked at historical daily average flow data at Freeport to identify the number of days with flows below 8,000 CFS; is that correct?

WITNESS NADER-TEHRANI: I'm sorry. What's the question?

MR. SALMON: When you did the calculation, specifically when you were counting the number of days with flows below 8,000 CFS, you were looking at historical daily average flow data at Freeport, correct?

WITNESS NADER-TEHRANI: That's correct.

MR. SALMON: And in contrast to that, Dr. Bray's analysis focused on the number of months below 8,000 CFS, correct?

WITNESS NADER-TEHRANI: That's correct.

MR. SALMON: Is it possible that some of the 371 days that you identified with flows below 8,000 CFS occurred during months that had an average monthly flow above 8,000 CFS?

WITNESS NADER-TEHRANI: That could be, yes.

MR. SALMON: Would you agree that a Freeport monthly average flow below 8,000 CFS is a relatively

less common event than in a Freeport daily average flow below 8,000 CFS?

WITNESS NADER-TEHRANI: Could you repeat the question?

MR. SALMON: Yeah. I can ask it another way.

What I'm asking for is, of these two things, which -- do you know which one is more extreme? Which one represents a more extreme flow condition? A monthly average flow below 8,000 CFS at Freeport or a daily average flow below 8,000 CFS at Freeport?

I know there are more days than months. I'm asking, comparing apples to apples, which one is more extreme?

WITNESS NADER-TEHRANI: I'm not sure.

MR. SALMON: Okay. I'd like to move on to the topic of bias correction.

Could you please display Exhibit DWR-50, which is Dr. Nader-Tehrani's summary of his rebuttal testimony? And I'd like Slide 29.

MR. OCHENDUSZKO: Did you want 50 or 50 errata?

MR. SALMON: I believe 50, because 50 errata is just an excerpt of slides other than this slide.

MR. OCHENDUSZKO: Thank you.

MR. SALMON: Dr. Nader-Tehrani, this slide, at

least the graph on this slide, is taken from Dr. Bray's direct testimony, correct?

WITNESS NADER-TEHRANI: That's correct.

MR. SALMON: So we discussed what this shows, so we don't need to recap all that in detail.

In general, would you agree that the graph on this slide plots the velocity of flow at Freeport during part of February 1991 and compares the -- does that by comparing observed gauge data with uncorrected and bias corrected DSM2 output data?

WITNESS NADER-TEHRANI: That's correct.

MR. SALMON: So according to the gauge data, which is shown in blue, there were several actual reverse flow events during this period; is that correct?

WITNESS NADER-TEHRANI: Based on Freeport gauge?

MR. SALMON: Based on what this chart depicts. I understand the -- this chart to depict gauge data at Freeport during this period, among other things. Is that your understanding?

WITNESS NADER-TEHRANI: Yeah, that's correct. Based on Freeport gauge, I do see some days that there are reverse flow events but not necessarily an SRFE.

MR. SALMON: Did any of the actual reverse flow events shown on the gauge data, the blue line, did

any of those reverse flow events show up in the uncorrected DSM2 output that's plotted on the dotted red line?

WITNESS NADER-TEHRANI: In this eight-day period, I do not see that.

MR. SALMON: If I used the terms "low low tide" and "high low tide," do you understand -- have an understanding of what I mean by that?

WITNESS NADER-TEHRANI: You can go on, and I can tell you if I need further explanation.

MR. SALMON: Okay. Do you -- well, what is your understanding of that, briefly?

WITNESS NADER-TEHRANI: I had --

MR. SALMON: The difference between low low tide and high low tide?

WITNESS NADER-TEHRANI: We do that with respect to water levels that is, you know, mostly, based on my understanding, that a very high high water level that represents the high high. And that the very low end, that would represent the low low.

MR. SALMON: In terms of velocity as depicted on this chart does this chart depict peak velocities that represent a high low tide and other peaks that represent low low tide?

WITNESS NADER-TEHRANI: Again, I'm more

familiar using the terminology with respect to water levels and not velocity.

MR. SALMON: Okay. Do you agree that the uncorrected DSM2 velocity data on this chart -- again, that's the dotted red line -- underpredicts the magnitude of the actual low low tide velocities in every case on this chart?

WITNESS NADER-TEHRANI: This eight-day window, yes.

MR. SALMON: And to clarify your written testimony, you do not disagree with Dr. Bray's conclusion that DSM2 systematically underpredicts peak velocity of Freeport during high and low tide; is that correct?

WITNESS NADER-TEHRANI: I'm only judging based on this one figure, and so I don't necessarily agree with its conclusion. Based on this eight-day window, yes, that seems to be correct.

MR. SALMON: Do you have any knowledge in your experience, other than this chart, of a systematic underprediction of peak velocities in the DSM2 model?

WITNESS NADER-TEHRANI: Not at this location.

MR. SALMON: In your opinion, is it accepted practice among modelers to perform bias correction before a modeler analyzes model output data to the

extent the modeler is aware of a bias within the model that would affect that analysis?

WITNESS NADER-TEHRANI: Depending on the specific item of interest. As long as the person who's analyzing is fully aware of the consequences of applying the bias correction.

MR. SALMON: Dr. Bray testified that he calculated an optimal offset for DSM2's velocity output data by minimizes the sum of square error between the model simulation and historical data.

Do you believe that is an acceptable method for correcting bias within model output?

WITNESS NADER-TEHRANI: For this -- in the -- in the methodology that Dr. Bray used to use that information to predict the frequency of SRFE events, I don't think that was the appropriate way.

MR. SALMON: And what is the basis for that opinion?

WITNESS NADER-TEHRANI: Exactly what I wrote here. Because by doing so, he introduced events that are falsely identified as reverse flows in an eight-day window. And I -- I specified the days.

MR. SALMON: And you believe that -- assuming that you're correct that it does that, you believe that results from the method that he chose, the sum of square

methodology?

WITNESS NADER-TEHRANI: In order to predict the frequency of the SRFE events, I believe his method of using the sum of square would not tell me the right way of doing it.

MR. SALMON: Okay. Do you agree, however, that the sum of square methodology uses a mathematical approach to identify an optimal offset and does not require a modeler to subjectively estimate the offset?

WITNESS NADER-TEHRANI: I'm very much aware of that methodology. And, as such, one would understand that there are times you would underestimate and you have lower error and at times you would have overestimate.

And because the SRFE event by definition requires a low enough negative velocity, therefore, it is my conclusion that my introducing a simple bias based on the sum of a square methodology, you would have a higher population of those events that would lead to a conclusion that that would be considered an SRFE event.

MR. SALMON: Let's look again at this graph and specifically the peak velocities during each day's low low tide. And by that I mean the lowest peak low on each particular day.

Do you agree that the bias-corrected DSM2

output on this graph approximates the actual measured velocities more closely than the uncorrected DSM2 output?

WITNESS NADER-TEHRANI: No.

MR. SALMON: And why do you say that?

WITNESS NADER-TEHRANI: I mean take, for example, on the February 13. You would compare green line versus the red line and versus the gauge. I see there are two lows on the 13. I'm referring to the first one. You see the red line is closer to the Freeport gauge than the green line is. So that's an example.

MR. SALMON: Okay. I'm asking specifically about the lowest low in each day. And just to be clear, the reason why I'm focusing on that is because the -- as Dr. Bray testified, the low low tidal peaks are more closely associated with SRFEs. So he testified that is why -- that's how he calculated his offset. That's why I'm asking about those specific peaks.

WITNESS NADER-TEHRANI: It looks like in a lot of events the four days that I show were identified -- basically, the correction event he overcorrected basically in those four days.

MR. SALMON: Do you agree that at times the bias-corrected data also underpredicts velocity at peak

low low tide on this chart?

WITNESS NADER-TEHRANI: That's correct.

MR. SALMON: So it's not a consistent overprediction of reverse flows? It's sometimes underpredicting them and sometimes over?

WITNESS NADER-TEHRANI: Correct. But because the SRFE event mainly requires a low enough negative -- or high enough negative velocity, simply doing a sum of square approach, it is my opinion that you would get a higher population of those events if you simply do a -- a sum of square approach in correcting the bias.

MR. SALMON: And is that opinion -- are you expressing that opinion with reference to the low low peaks as opposed to the -- all of the reverse peaks?

WITNESS NADER-TEHRANI: I'm basing that opinion on the four days I identified. Truly they were not reverse flows, yet the bias correction made them look like a -- a reverse flow.

MR. SALMON: So you point to four specific events in your --

WITNESS NADER-TEHRANI: This is an eight-day window, so we're talking one out of every two days.

MR. SALMON: I understand.

And do you know whether any of those four events would meet the criteria to qualify as a

significant reverse flow event that would require the Freeport project to shut down?

WITNESS NADER-TEHRANI: No, they would not. But my opinion is if it's doing a -- if it's overpredicting the -- the opportunity for reverse flows, it would do so also -- it would lead to a higher frequency of SRFE events. And I can point to some figures in Dr. Bray's if that would be helpful.

MR. SALMON: I anticipate we may get to that in another topic.

But of the four examples --

WITNESS NADER-TEHRANI: Yes.

MR. SALMON: -- that you cited of overprediction on this chart of the bias-corrected data, only one of those four occurs during a low low tide; is that correct?

WITNESS NADER-TEHRANI: Let's look at each one individually.

The 11th of February, you see the green line going below zero. That happens at the low velocity -- lowest velocity that day.

MR. SALMON: You see any other examples?

WITNESS NADER-TEHRANI: Let's move on. Now the 14th. On 14th, according to the green line, you will see two reverse flow events, but that does not

represent the lowest velocity.

On the 15th, once again, that -- that -- the one that's on the 15th is not the lowest velocity.

On the 16th, it's coming close. The green line is showing two reverse flows whereas CDEC data shows only one.

MR. SALMON: If someone performed bias correction using the sum of square offset method, and they specifically attempted to achieve a fit with low low peaks, if that was the specific purpose, when the sum of square calculation was done, would you expect the bias-corrected output to fit better with the low low peaks than with other peaks?

WITNESS NADER-TEHRANI: I'm not sure.

MR. SALMON: I'll move on.

I'd like to ask you about some opinions in your rebuttal testimony regarding the appropriate use of model results.

Can we look at page 17 of your rebuttal testimony? Again, DWR-79, in lines 4 through 9, page 17.

You wrote that Dr. Bray's bias-corrected DSM2 data shows 82 SRFEs per year in 1976/1977 period even though there were, in your opinion, 2.3 SRFEs per year during 2014 and 2015, which you call an almost equally

dry period. And I think you referred to this concept earlier, this comparison.

WITNESS NADER-TEHRANI: That's correct.

MR. SALMON: And you conclude here that Dr. Bray's estimate is, at best, extremely questionable.

It seems that in this part of your rebuttal, you've compared DSM2 model results with recent historical data with actual occurrences; is that correct?

WITNESS NADER-TEHRANI: I was comparing Dr. Bray's predictions as far as what he believes the frequency of the significant reverse flow events are to what I believe to be the frequency of the SRFE events based on actual observations in the 2014/2015 period.

MR. SALMON: So to be clear, you were comparing model output data to actual occurrences?

WITNESS NADER-TEHRANI: My attempt was to show that -- the high degree of difference between the two to illustrate my point.

MR. SALMON: Okay. So that -- I understand why you did it, but that's a yes?

WITNESS NADER-TEHRANI: I was comparing model -- Dr. Bray's analysis based on, you know, what his method of using bias correction with the actual observed data of a different period. But I would -- I

would consider that to be, you know, very dry period similar to '76/'77, almost compared -- I expected the probability of SRFE events to be, and I was trying to illustrate a point that they are not in line, those estimates.

MR. SALMON: There's been some discussion in cross-examination and some opinions expressed in written testimony of people on this panel regarding the appropriateness or lack of appropriateness of comparing model output data to actual measured data or actual events. And so I have some questions about how comparable these things are that you compare, the model output with the actual occurrences during the last drought.

Does the NAA modeling that Dr. Bray analyzed represent a future condition?

WITNESS NADER-TEHRANI: That's correct.

MR. SALMON: Does it incorporate a future level of development?

WITNESS NADER-TEHRANI: That's correct.

MR. SALMON: Does the NAA include modifications to historical hydrology to simulate climate change?

WITNESS NADER-TEHRANI: To my understanding, that's correct.

MR. SALMON: And the NAA also assumes a certain level of sea level rise, correct?

WITNESS NADER-TEHRANI: I believe it's 6 inches, 15 centimeters.

MR. SALMON: So there are several future conditions built into the model that do not yet exist in the real world and did not exist in 2014 and 2015; is that right?

WITNESS NADER-TEHRANI: That's correct.

MR. SALMON: Would you expect these future conditions to cause -- and specifically the incorporation of those future conditions in the model. Would you suspect that to cause the model results to look different than actual historical data?

WITNESS NADER-TEHRANI: Not to the degree that that is shown.

MR. SALMON: But you would expect a difference?

WITNESS NADER-TEHRANI: I would expect some difference, yes.

MR. SALMON: So, for example, if you looked at model flow data for 1990 and you compared it with gauge data from 1990, would the future conditions incorporated into the model result in model flows differing from the actual observed flows?

WITNESS NADER-TEHRANI: It would be different.

MR. SALMON: So given that all these future conditions were built into the model that do not yet exist in the real world, would you agree that it's inappropriate to directly compare the frequency of actual SRFEs with the frequency of modeled SRFEs?

WITNESS NADER-TEHRANI: My main reason for including that statistic was to show the great degree of difference between these two numbers. The changes that you mentioned, in my opinion, does not provide enough of a difference to cause that kind of a magnitude of a difference in terms of outcome for the occurrences of the SRFEs.

MR. SALMON: Can we look at page 28 of your rebuttal testimony?

Down at the bottom that page. In fact, if you could get to the top of 29, that would be good. The sentence that begins "Dr. Burke."

In this part of your testimony, it appears that you're critiquing another expert modeler's choice to compare historical EC values to the EC values that were modeled in the NAA. You said in your testimony that it was inappropriate for that modeler to compare historical data with modeled data to support his arguments.

Is that an accurate summary of this portion of your testimony?

WITNESS NADER-TEHRANI: Which line?

MR. SALMON: I'm looking at the -- starting at line 25 of page 28 and really the rest of that paragraph. So through to line 5 of page 29.

WITNESS NADER-TEHRANI: Yeah. My explanation of that, this is appropriate use of that model, and it is my opinion to -- that it would be incorrect to compare model results for, you know, 15 minutes or a day from one scenario to the other.

MR. SALMON: Well, why is it appropriate for you to compare the frequency of SRFEs modeled in the NAA with the historical frequency of SRFEs actually experienced during the last drought but not okay for the other expert modeler to do what he did?

WITNESS NADER-TEHRANI: As I said, I was just illustrating the large difference in terms of the two, one being 2.3, one being, you know, a lot higher. I forget the actual number, 80, to illustrate the point that it's -- you know, the outcome of his use of the model results would lead to believe that.

MR. SALMON: You just mentioned the use of 15-minute output data. I'd like to ask you about that too.

WITNESS NADER-TEHRANI: Correct.

MR. SALMON: Can we move to page 11 of your testimony? At the top of the page, lines 1 through 4.

The key phrase there is "is inappropriate to compute differences between two planning scenarios 15-minute output."

Is it fair to say --

WITNESS NADER-TEHRANI: Can you scroll up, please? Can you go down? Yes, go ahead.

MR. SALMON: Is it fair to say that as a general matter, you believe that DSM2 15-minute output data, in any scenario, should not be compared to the 15-minute output data for a different modeled scenario?

WITNESS NADER-TEHRANI: One, it all depends on what purpose, what use. So I would not make that general statement.

But, in general, when you're using DSM2 model in conjunction with CalSim II, it would be inappropriate, generally speaking, to compare model output for one scenario given 15 minute to the other prediction for the same time -- 15 minute of another scenario.

MR. SALMON: Do you believe DSM2 output should be averaged on a monthly basis in order to compare to other scenarios output when CalSim data is used?

WITNESS NADER-TEHRANI: I was also cautioning against the use of the model in terms of even a single month. The appropriate uses that I was recommending was either long-term averages, long-term averages based on water year type, or probably distribution types.

MR. SALMON: Can you identify SRFEs by looking at long-term or monthly averages of DSM2 velocity output?

WITNESS NADER-TEHRANI: No, you can't. So this would be an exception.

MR. SALMON: In the case of analyzing SRFEs, would be it appropriate to look at 15-minute DSM2 output?

WITNESS NADER-TEHRANI: In predicting SRFE event by definition because it -- it -- the meaning of SRFE, as I understand it, would be -- in one that would lead to, you know, tide with an effective reverse distance of .9 mile. The only way to achieve it would be to use the 15-minute output from DSM2.

MR. SALMON: So it would be appropriate to do so?

WITNESS NADER-TEHRANI: Then you -- what happens, then you have to compare the frequency of one scenario to the other as you're doing so. For example, for a given month, one scenario may say 4, the other

scenario for that same month might say 3. Then it would be -- at that point, it would be inappropriate to compare those single months. You know, from there on, you really have to look at the probability distribution across the set, the whole period.

MR. SALMON: Moving on, we've talked a lot about exceedance curves lately. And I have a few questions about the exceedance curve on page 14 of your testimony. And it's labeled Figure 5.

Is this curve essentially a plot of the modeled flow at Freeport for every month during the 82-year period?

WITNESS NADER-TEHRANI: This is the model off of CalSim II for the entire 82 years. That's correct.

MR. SALMON: And it's a plot of months?

WITNESS NADER-TEHRANI: Monthly average flows.

MR. SALMON: Monthly average flows.

And it plots the NAA and all four operational scenarios, correct?

WITNESS NADER-TEHRANI: That's correct.

MR. SALMON: And there's only CalSim flow output represented on this exceedance chart, correct? Not velocity output, for example?

WITNESS NADER-TEHRANI: That's correct.

MR. SALMON: And this chart only shows one

point on the river, Freeport; is that right?

WITNESS NADER-TEHRANI: That's correct.

MR. SALMON: So this exceedance curve doesn't tell us anything about whether changes in flows might be significantly changed either up or down during specific times of year?

WITNESS NADER-TEHRANI: I was primarily using this in response to Dr. Bray's use of the CalSim II flows to determine the potential for the frequency of the SRFE events.

MR. SALMON: If I were interested in seeing how flows would change in operational scenarios in a particular season, say in the fall, could I tell that from this chart?

WITNESS NADER-TEHRANI: Not from this chart. There are other ways you could tell.

MR. SALMON: So even though this particular curve does not show large flow changes at Freeport, is it possible that similar flows at a location farther downstream or a similar plot of flows for another location downstream would show greater flow changes under the operational scenarios?

WITNESS NADER-TEHRANI: Can you define?

MR. SALMON: Any point farther downstream. And I'm just asking if it's possible that if measured at

a different location than Freeport, that the exceedance curve might, at that location, show a wider variation among the modeled scenarios inflows?

WITNESS NADER-TEHRANI: I only use this location because Dr. Bray used the same location and it's the closest proximity to the Freeport facility.

But the answer to your question, yes, it could be different. Flows at other location downstream could be different.

MR. SALMON: If there were a greater reduction of flows in operational scenarios at a downstream location as compared to the NAA, is it possible that that would affect the velocity at Freeport?

Could it affect the upstream affective transport distance?

WITNESS NADER-TEHRANI: As I said, the only reason for me to show this plot was in response to Dr. Bray's use of CalSim model output. That's the only -- that's the only piece of information I get from this plot.

MR. SALMON: I understand.

WITNESS NADER-TEHRANI: I did not use this to mean that -- you know, the implied what this frequency of this SRFEs would be in relationship to this distribution.

MR. SALMON: Okay. I was just trying to understand what we can use this chart for and what you would not use this chart for.

I understand that you're representing that this curve shows a minimal impact on flows of Freeport in the operational scenarios, and I'm trying to understand whether there could be impacts not shown as specific times of year or in other locations that might affect Freeport.

WITNESS NADER-TEHRANI: DSM2 would be the right tool to do the more accurate analysis.

MR. SALMON: I just have a few more questions on a couple smaller topics.

On page 13 of your testimony, 1 through 3, you wrote that Dr. Bray testified that he didn't do any statistical analysis for this approach.

If we scroll -- I guess we should scroll so we can see what that's referring to. Please review page 12, line 25 through the end of that paragraph.

WITNESS NADER-TEHRANI: Yes, I see that.

MR. SALMON: And in your opinion, what kind of statistical analysis would have been appropriate for that purpose?

WITNESS NADER-TEHRANI: In his approach, he was trying to use flow at Freeport as the only

indicator. But he did acknowledge the fact that there are other factors that are important, specifically the strength of the tide.

And so that's where, I think, you know, if you look at his plot, you will see that there are times with even higher flows you could have an SRFE event. And -- but often you require flows that are -- so just because -- the point I was trying to make is just because you have a flow that's below 8,000, that there is still a very low probability of having SRFE event.

Dr. Bray himself acknowledges in his testimony that he believes the SRFE events are rare.

MR. SALMON: Is there any kind of statistical analysis of CalSim II data that you believe could or should be done to inform the type of analysis that Dr. Bray was performing?

WITNESS NADER-TEHRANI: I'm basically -- well, the -- my testimony yesterday showed that even if you take Dr. Bray's analysis, what you would see is that you still would not conclude that there are higher degree of SRFE events; that his conclusion, you look at all the tables, that you would not reach that conclusion even based on the methodology he used that I felt was incorrect.

MR. SALMON: Finally, I'd like to ask you

about a statement on page 13 of your testimony, rebuttal testimony, lines 19 to 21.

Here you wrote quote: "Any general analysis based on CalSim II results should be based on the entire 82 years of record." I know that Ms. Nikkel asked you what you meant by that.

My question is: Didn't Dr. Bray do that? Didn't he apply his monthly flow criteria to the entire 82-year CalSim II period?

WITNESS NADER-TEHRANI: The flaw, I believe, in his approach was he identified the months where a flow at Freeport at any -- any one of the operational -- CWF operational scenarios were lower than no-action and lower by 20 CFS. He did not look at -- at this -- at the opposite of this whereas -- where looking at the flows at times when the flow at Freeport is higher under California WaterFix but being lower than 8,000. That's where I think the flaw is.

Yes, he did use entire 82 years, but he only reported the months where he believed the flow at any one -- single one of those operational scenarios were lower, but not the opposite.

MR. SALMON: The injury in question here, SRFEs, occur and are associated with low flows and reductions in flows; is that correct?

WITNESS NADER-TEHRANI: That's correct.
MR. SALMON: I have no further questions.
CO-HEARING OFFICER DODUC: Are you done?
MR. SALMON: I am done.
CO-HEARING OFFICER DODUC: Thank you, Mr. Salmon.
Before we adjourn for the week, a clarification, Mr. Mizell. In response to Mr. Shutes' request for those documents, I took your answer to mean that you will make that document available to the entire service list and not just Mr. Shutes, correct?
MR. MIZELL: Yes. What I will likely do -- if it's not objectionable to the hearing officers, I will assign DWR-902 so that we have something to identify it by and submit a revised exhibit index along with that and serve it on all the parties.
CO-HEARING OFFICER DODUC: All right. And Mr. Shutes, if I forget, next week, I'm sure you or Mr. Jackson will remind me if you have additional follow-up questions based on those documents.
MR. SALMON: Yes.
CO-HEARING OFFICER DODUC: Anything else, Mr. Berliner?
MR. BERLINER: Yes. One point of housekeeping before we break.

Earlier, you had asked folks that were in attendance who would have an interest in our last panel, and I notice that some of them are still here.

By my sort of rough calculation, we probably have five to seven hours left with this panel, which sounds like it will pretty much take up all of Tuesday.

Dr. Thornberg, who's on our last panel, has to travel. So I'd like to tell him to be here Wednesday morning and be prepared to testify. And so since some of the folks who want to cross-examine him are here, if we could just set that so they know when he's going to come. And, you know, if we go over into Wednesday with this panel, that's fine. I'm not seeking to cut anybody off. It's just we would tell him to be prepared to be here Wednesday morning and be prepared to testify. And it sounds like we have four or five people who want to cross.

CO-HEARING OFFICER DODUC: And you also have Ms. Des Jardins, who also submitted a late -- not a late because we haven't gotten to her yet, a request to conduct cross-examination as well.

I would concur with you, Mr. Berliner, that we will likely need most of Tuesday to complete this panel, if not more.

So I would say that Wednesday is a safe bet.

MR. BERLINER: Thank you. We'll have him here Wednesday. Thank you very much.

CO-HEARING OFFICER DODUC: Mr. Hitchings?

MR. HITCHINGS: Yes, Hearing Officer Doduc.

I just wanted to let you know I did confer with my colleague, Kelley Taber, and she estimated about 15 minutes for this panel of cross-examination.

CO-HEARING OFFICER DODUC: So that's Group 22 will have 15 minutes.

MR. HITCHINGS: Yes.

CO-HEARING OFFICER DODUC: Thank you. Thank you for doing that.

Seeing nothing else, we are adjourned for the week. And we will see you on Tuesday for a nice four-day week of WaterFix hearing.

(Whereupon, the hearing was closed at 4:45 p.m.)

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I, Megan Alvarez, a Certified Shorthand Reporter, hereby certify that the foregoing proceedings were taken in shorthand by me at the time and place therein stated, and that the said proceedings were thereafter reduced to typewriting, by computer, under my direction and supervision;

I further certify that I am not of counsel or attorney for either or any of the parties to the said proceedings, nor in any way interested in the event of this cause, and that I am not related to any of the parties thereto.

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