BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

CALIFORNIA WATERFIX WATER RIGHT CHANGE PETITION HEARING	)))

JOE SERNA, JR. BUILDING

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

BYRON SHER AUDITORIUM

1001 I STREET

SECOND FLOOR

SACRAMENTO CALIFORNIA

PART 1 SURREBUTTAL

Friday, June 16, 2017

9:30 A.M.

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Reported By: Deborah Fuqua, CSR No. 1248

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APPEARANCES:

CALIFORNIA WATER RESOURCES BOARD

Division of Water Rights

Board Members Present

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

Staff Present

Dana Heinrich, Senior Staff Attorney
Conny Mitterhofer, Senior Water Resources Control Engr.
Kyle Ochenduzsko, Senior Water Resources Control Engr.

For California Department of Water Resources

William Croyle, Director
Tripp Mizell, Senior Attorney
Robin McGinnis, Senior Attorney
Cathy Crothers, Assistant Chief Counsel
Ken Bogdan, Senior Attorney

Duane Morris, LLP
By: Thomas Martin Berliner, Attorney at Law
By: Jolie-Anne Ansley, Attorney at Law

U.S. Department of the Interior, Bureau Reclamation,
and Fish and Wildlife Service

Amy Aufdemberge, Assistant Regional Solicitor

State Water Contractors

Stefanie Morris
Adam Kear
Becky Sheehan

(Continued)

APPEARANCES (continued)

Cities of Folsom and Roseville, San Juan Water District, and Sacramento Suburban Water District
Ryan Bezerra

Local Agencies of the North Delta
Osha Meserve

Carmichael Water District
Aaron Ferguson

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

City of Sacramento
Wesley Miliband

City of Stockton
Kelley Taber

City of Antioch
Matthew Emrick

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Friday, June 16, 2017 9:31 a.m.

PROCEEDINGS

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CO-HEARING OFFICER DODUC: Good morning, everyone. Please take your seats. We are one minute late. It is 9:31, and we are resuming with the Water Right Change Petition for -- the Water Change Petition Hearing for the California WaterFix project.

I am Tam Doduc. And to my right is Board Chair and Co-Hearing Officer Felicia Marcus. Board Member DeeDee D'Amado is watching us on the webcast. To my left are Dana Heinrich, Conny Mittenhofer and Kyle Ochenduszko.

We also are being assisted today by Ms. McCue and Mr. Hunt.

Since the faces in the room are all familiar to me, I don't think I need to reiterate the general announcements, unless someone needs me to. All right. The only thing I will say is turn off all noise-making devices, put it on silent or vibrate.

Okay. Before we begin, I see Ms. Womack standing right there. And so, Ms. Womack, I assume you have some questions with respect to a request filed by DWR.

MS. WOMACK: Absolutely. Well, we would like

to deny the request because -- and I'm not sure, you know, whether or not we even can because, like you know, I'm not a lawyer; I'm a second grade teacher. But even in second grade, it's just not fair.

Anyway, first of all, I'm having technical difficulties as usual. And DWR sent out the documents that they wanted submitted without any sort of, you know, cross or rebuttal or anything, any sort of look-at by us. And I believe they left out DWR-946, which is condemnation papers of our neighbor. And I -- we -- we -- no one ever knew what anyone settled for or how much.

And you know, this document is very interesting when you compare it to how we were treated. And I -- I want to make sure that DWR-946 is left in. My goodness. And would also request that Mr. Davis's testimony besmirched our family. It basically calls us a liar, that we've been paid. But DWR likes to paint a picture that we've been paid so well. I--

CO-HEARING OFFICER DODUC: Ms. Womack, Ms. Womack, let me interrupt and -- at least with respect to that last point you just made. I am not a teacher, and I'm definitely not a lawyer.

But my understanding of the request that Mr. Mizell -- and perhaps you can clarify,

Mr. Mizell -- made was that testimony has been withdrawn. It no longer exists. It's not in the record.

MS. WOMACK: But it does exist. I have a copy of it. It's been made -- in the age of the Internet, it exists. You cannot withdraw. I'm sorry. You can't. And so I would like to be able to respond to it.

CO-HEARING OFFICER DODUC: Yes, and you will. Hold on.

Okay. Ms. Womack, I am completely sympathetic to -- and Mr. Mizell knows how much I do not like late-minute changes. But as he mentioned yesterday, his witness was called away I believe it was by -- court order of some kind?

MR. MIZELL: Yeah, San Joaquin County Superior Court.

CO-HEARING OFFICER DODUC: San Joaquin County Superior Court.

MS. WOMACK: For the rest of the summer?

CO-HEARING OFFICER DODUC: What I ruled yesterday was that everyone, anyone who has concerns may file a response to their request by noon on Monday.

MS. WOMACK: That doesn't give me much time. My goodness. Here -- he has loads of lawyers working

for him. I'm working on my own. I'm hosting Father's Day. I'm hosting a family gathering. And I'm supposed to, on top of this -- I have tried to follow the rules. This is -- this is just not fair. It's yet another case of not being fair.

And, you know, Al Davis is an expert on real estate. He's an expert on levy repair. This is just where we need to look at.

DWR is the one that brought in these from the 1970s. They would like to hold us to the 1970s agreement that were signed by land owners other than ourselves. They would like to hold us to this agreement that they brought in and brought up. You didn't want -- you know, we weren't bringing up the past before. But they wanted to bring this up. And now they want to take some out, and they want to take out their expert witness.

I want to be able to talk to Mr. Davis. I can beat him any time. You know, the Winston Churchill, on the beaches, wherever. We're going to fight. This is not fair.

You know, my lawyer friends have told me not to take this personal, but this is personal. My gosh. Since this -- since this trial started, I've spent another 36,000 on sump pumps that pumped out my seepage

water. My dad says, "Oh, that's not the big money. The big money is taking care of the levees." This is all way in the past that DWR says, "Oh, that's way in the past," and they can ignore it.

But we're supposed to abide by the past, abide by the $1600 that we got in seepage damage that's very clearly -- I have all kinds of papers that I wanted to cross Al Davis with.

This is important stuff. We are the only people from the SWP water project that are alive that have been harmed on a regular basis.

You guys are great. You're the Board. You're deciding, "Are we going to let DWR go through?"

And DWR is saying, "We're great. We're not going to cause harm. We haven't caused harm."

Baloney. We've been harmed for 50 years. And they're saying, "Oh, no. That didn't matter. You signed that away."

It's not fair. I want to talk to Al Davis. I'll be glad to meet any time. Because he's not available today? We have weeks. And you want me to file more by Monday at noon? I'm not a lawyer. I have I -- there's a lot of paperwork. And I don't even know the proper thing to do. But I came ready. We all turned everything in. In second grade, you know,

you're treated equally. We're not being treated equally here, and it's not fair. And I hold it up to the Board to really re-think your decision to let DWR walk away.

And certainly I want to make sure this condemnation paper from the Molquinis, our neighbors, is in the document so we can look at how they were treated, how we were treated. It was wrong 50 years ago. It's wrong today. Our treatment in between is 50 years of wrong. It's just wrong.

Anyway, I appreciate your time and let -- you know, I will abide by whatever decision you decide.

CO-HEARING OFFICER DODUC: We have not granted the DWR's request that was made with respect to official notice of the document that they filed yesterday. Again, I have given everyone until -- well, Ms. Womack, we'll give everyone until noon Tuesday because there was another deadline, I think, associated with that.

So everyone will have until noon Tuesday to provide any response to the request that Mr. Mizell sent out yesterday or at least that the Department sent out yesterday.

Ms. Womack, what you have just said is in the record. It's in the transcript. We will consider that

as part of the decision on this request that was made by DWR. You are -- if you would like to file some additional written comments for us to consider by noon Tuesday, we will be happy to consider those written comments in addition to what you have just said verbally today.

MS. WOMACK: Okay. Well, I'm not quite sure I'll remember exactly what I just said, but I will put into writing everything I was going to ask Al Davis. Is that something? And I will submit documents that prove other things. I will submit everything as if it was Al Davis. Is that something I can do as something to say this isn't fair?

CO-HEARING OFFICER DODUC: Not at this time. I wouldn't suggest you -- I don't want you to do a lot of work because you have other commitments between now and Tuesday.

But if you want to capture at least the main reasons, the main concerns you have with respect to the proposal that DWR just made to withdraw these documents, then please do share that with us.

MS. WOMACK: Thank you. One other technical difficulty -- maybe Kyle can help me.

Kyle, I got from DWR, I got their -- what they were going to take out. And I've looked at it and all

that. It's disappeared from my phone. And I don't know if it's on the website. I mean, I cannot find the exact documents. So is there some way -- because I know they -- I think they submitted ten documents, and there's like six or seven. They're leaving out this -- I believe they're leaving out this one document. And I don't want to waste the Court's time. I really don't. So is there a way I can double-check if this document's in?

MR. MIZELL: If you'd like me to clarify, our request for judicial notice does include the document Ms. Womack is referring to, DWR-946.

MS. WOMACK: Really? Okay. But you took out some.

MR. MIZELL: We are not seeking judicial notice of any other documents that are not previously publicly available and posted online, and --

CO-HEARING OFFICER DODUC: I'm sorry. Mr. Mizell, my understanding of Ms. Womack's request was that she was not able to locate some of those documents.

MS. WOMACK: Yeah. So there were the ten documents that they put in, that Al Davis put in. And there's not ten that are put -- sorry.

He's trying to find --

CO-HEARING OFFICER DODUC: Is that your way, Ms. Womack, of double-speaking?

MS. WOMACK: I didn't realize I was so smart. Geez. I just have these things down -- I'm so sorry.

CO-HEARING OFFICER DODUC: All right. Mr. Ochenduszko --

MS. WOMACK: I want to make sure that all ten things that they submitted are all ten things that -- you know -- you know, the testimony, I would like that submitted, too. I would like everything submitted. But there's more than just the testimony that's missing, as far as I can tell. There was something not quite right. But it's gone from my device. Thank you.

CO-HEARING OFFICER DODUC: All right.

MR. OCHENDUSZKO: Ms. Womack, if you don't mind, we'll have somebody come done and discuss with you. But we want to -- we want to keep going with the hearing at this moment. Thank you.

MS. WOMACK: Awesome.

CO-HEARING OFFICER DODUC: All right. Any other housekeeping matters?

Mr. Bezerra.

MR. BEZERRA: Thank you. I'd just like to make sure I understand the procedures for offering exhibits into evidence. My understanding is that DWR

will be offering -- and I suppose Department of Interior will be offering all of their exhibits into evidence at the close of all of their witnesses' testimony? Is that the -- and then we will make objections if necessary at that time?

CO-HEARING OFFICER DODUC: That is correct.

MR. BEZERRA: So a little bit later today, probably this morning?

CO-HEARING OFFICER DODUC: Likely.

MR. BEZERRA: And then the cross-examination exhibits, when would you like those offered into evidence, simultaneously or, in my case, at the end of Group 7's testimony?

CO-HEARING OFFICER DODUC: We will do it like we did in the rebuttal phase. Upon completion of the surrebuttal phase, everybody will have the opportunity if they so wish to move their cross-examination exhibits into the record.

I would like to deal, Mr. Bezerra, with one set of exhibits at a time. And for -- the focus for me right now are the exhibits for the surrebuttal testimony.

MR. BEZERRA: And so the cross-examination exhibits I used yesterday --

CO-HEARING OFFICER DODUC: I'm sorry. The

documents that you used for cross-examination yesterday?

MR. BEZERRA: Yes. I would offer that into evidence at the end of Group 7's presentations?

CO-HEARING OFFICER DODUC: I would prefer you wait until the end of the complete surrebuttal phase --

MR. BEZERRA: Oh, all surrebuttal?

CO-HEARING OFFICER DODUC: -- and move all your cross-examination exhibits at the same time.

MR. BEZERRA: I understand.

CO-HEARING OFFICER DODUC: Unless you don't plan to conduct cross-examination of any other parties.

MR. BEZERRA: I understand. I just wanted to make sure I understood the procedure. Thank you.

CO-HEARING OFFICER DODUC: Ms. Meserve.

MS. MESERVE: Good morning. One quick question following up on the same issue.

Yesterday, during my cross-examination, you mentioned that the LAND-116 was just the map.

CO-HEARING OFFICER DODUC: 114.

MS. MESERVE: Thank you. I would like to review the transcript prior to committing to withdrawing that. So I will -- obviously I have time to do that.

CO-HEARING OFFICER DODUC: That's fine,

Ms. Meserve, I just wanted to point it out.

MS. MESERVE: Thank you.

CO-HEARING OFFICER DODUC: I'm not automatically pulling it.

All right. Anyone else with housekeeping matter -- I do have a housekeeping matter for Mr. Mizell. I believe we had issued a ruling to Ms. Spaletta's request on some documents spreadsheets that you were supposed to provide. Per our ruling letter on June 14, have those documents been produced to all parties?

MR. MIZELL: Yes, they were served just before 9:00 a.m. this morning.

CO-HEARING OFFICER DODUC: Have you identified which witness or witnesses will testify as to this document's authenticity?

MR. MIZELL: We will have a witness available. And Ms. Spaletta and I have been in contact. We both agreed that Thursday the 22nd at 9:30 a.m. would be an acceptable time for us, if that works with the Board's schedule.

CO-HEARING OFFICER DODUC: All right. 9:30 -- I don't know if I can guarantee a specific time given -- we'll see how, you know, the natural flow of the surrebuttal testimony and cross-examination go.

But we will get to that witness that Thursday.

MR. MIZELL: Completely understand. Thank you.

CO-HEARING OFFICER DODUC: Okay. Any other housekeeping matters?

Mr. Emrick, I don't know if I'll allow you to speak today since you're wearing a tie.

MR. EMRICK: I followed Ms. Taber.

CO-HEARING OFFICER DODUC: You might want to talk to Mr. Keeling about what he had to do the last time he wore a tie on Friday.

MR. EMRICK: I didn't catch that, so I will.

My question has to do with the scheduling for Dr. Paulsen. It's my understanding from yesterday that we would go through Group 7 today?

CO-HEARING OFFICER DODUC: We will go as far as we can through Group 7 today. I don't know. We'll see.

MR. EMRICK: I just wanted to make sure that, for scheduling purposes, that Dr. Paulsen would be testifying next week.

CO-HEARING OFFICER DODUC: It looks like she will be.

MR. EMRICK: Okay. Thank you very much.

CO-HEARING OFFICER DODUC: All right.

Ms. Taber, welcome back. I believe you have another five or so minutes of questioning.

MS. TABER: I think it might take a little bit more than that. Yesterday I believe I started a little past 4:30, so I will try to be efficient. I have just one area to cover.

CO-HEARING OFFICER DODUC: And please remind me. What was that area?

MS. TABER: This area addresses Dr. Nader-Tehrani's surrebuttal opinion No. 2, that Dr. Paulsen overestimated chloride concentrations in Stockton's intake.

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

PARVIS NADER-TEHRANI,

called as a surrebuttal witness by the petitioners, having been previously duly sworn, was examined and testified further as hereinafter set forth:

CROSS-EXAMINATION BY MS. TABER (resumed)

MS. TABER: Good morning, Dr. Nader-Tehrani, Kelley Taber on behalf of the City of Stockton.

Dr. Nader-Tehrani, in your testimony you criticized Dr. Paulsen's use of the chloride conservation factor in Guivetchi for Station 16, which

is a station downstream of Stockton's intake. And you state that Dr. Paulsen could have used the factor for another location, which is Station 17, upstream, correct?

WITNESS NADER-TEHRANI: That's correct. And I just -- I want to make sure I'm clear. There is no specific location at City of Stockton's intake -- there is no EC-to-chloride conversion specifically available for that point. So there are these two points, and she could have considered either one. It's just that one overestimates the chloride, and that's the one that Dr. Paulsen used.

MS. TABER: Thank you. So if I'm understanding your testimony, then, someone wanting to calculate the chloride levels at the City of Stockton's intake has a choice in determining what chloride conversion factor they use, correct?

WITNESS NADER-TEHRANI: Well, I suppose one could use, you know, Station 16 and then Station 17, and then we know it's somewhere in between. However, I did provide additional information that suggested that, based on my analysis, that H3, H4, and Boundary 2, they all reduce the ocean -- you know, Martinez contribution, which makes Station 17 more appropriate and closer to what I believe the chloride conversion

would be -- chloride concentration would be at City of Stockton's intake.

MS. TABER: Okay. Thank you. But to get back to my question, there is discretion involved, and there is a choice that could be made, correct?

WITNESS NADER-TEHRANI: With the -- the explanation I just gave, you know, it's the same. If one uses 16, for sure it would overestimate the chloride concentration.

MS. TABER: Okay. Dr. Nader-Tehrani, did you prepare the model results for chloride that were used by DWR in this proceeding?

WITNESS NADER-TEHRANI: I asked my staff to provide it, mm-hmm.

MS. TABER: Okay. And with respect to the results for the City of Stockton, did DWR rely on Guivetchi Station 17 in developing those results?

WITNESS NADER-TEHRANI: Are you talking specifically about the testimony -- my testimony?

MS. TABER: I'm talk talking about Dr. Bryan's rebuttal report that provided his analysis of chloride impacts at the City of Stockton.

MR. MIZELL: Objection, goes beyond the scope of the surrebuttal.

CO-HEARING OFFICER DODUC: Ms. Taber?

MS. TABER: Well, Dr. Nader-Tehrani has offered an opinion regarding the appropriate chloride concentration -- the appropriate factor he used in calculating chloride concentrations at the City of Stockton's intake. So I think it's fair to test the reasonableness of his opinion in light of the evidence that DWR has submitted in this proceeding that's specific to Stockton.

MR. MIZELL: I believe his testimony lays out his reasoning and does not mention Dr. Bryan's work at this time. That would be revisiting rebuttal testimony, which wasn't within the scope of Dr. Parvis -- Dr. Nader-Tehrani, sorry, surrebuttal.

MS. TABER: Well, he has just said that he conducted the chloride modeling that Dr. Bryan relied on, if I understand his --

CO-HEARING OFFICER DODUC: Yes, thank you.

MS. TABER: Or he or his staff.

CO-HEARING OFFICER DODUC: I will allow you, Ms. Taber --

WITNESS NADER-TEHRANI: Let me make sure --

CO-HEARING OFFICER DODUC: -- some leeway to explore that.

WITNESS NADER-TEHRANI: -- I'm clear as to what I stated.

CO-HEARING OFFICER DODUC: Hold on.

WITNESS NADER-TEHRANI: I'm sorry.

CO-HEARING OFFICER DODUC: One at a time.

So, Mr. Mizell, objection overruled.

Dr. Nader-Tehrani, did you have a clarification to provide?

WITNESS NADER-TEHRANI: Yes, I believe I may have misunderstood Ms. Taber's questions. When I said that -- I was asked if I did the chloride analysis. And the response I was giving was in response to my testimony, that I asked my staff to provide the chloride concentration in this specific exhibit.

My staff did not provide the chloride concentration in Dr. Bryan's, you know, testimony.

CO-HEARING OFFICER DODUC: Okay.

MS. TABER: So did Dr. Bryan conduct the chloride conversion himself, to your knowledge?

WITNESS NADER-TEHRANI: I don't know.

MS. TABER: Let's -- if we could please put up exhibit Stockton 45, which is DWR-509. And I've add some highlighting to it.

This is not -- Stockton's 45 -- oh. Okay. I don't know how that -- do you have the exhibits that I gave you yesterday? I'm sorry. The numbering may have

been off on the file that I gave you.

Or we can just go to DWR-509. I have a copy with some highlighting I can provide Dr. Nader-Tehrani if it is important to clarify that.

Looks like there was a mistake that I made in identifying the exhibit number yesterday.

Okay. Thank you. If you could just scroll down to the section so that -- the section entitled "Sea Water Intrusion." That's good. Thank you.

So Dr. Nader-Tehrani, if you'll note the section under "Sea Water Intrusion" that lists a factor for converting EC to chloride, and it identifies chloride as 0.285 times an EC minus 50 --

WITNESS NADER-TEHRANI: That's how I see it, yeah.

MS. TABER: Is this the chloride factor that DWR used to convert EC to chloride in the EIR analysis?

WITNESS NADER-TEHRANI: I'm not hundred percent sure, but perhaps.

MS. TABER: Was the factor that you used in developing the chloride evidence that you submitted in this proceeding in the DWR's case in chief?

MR. MIZELL: Objection, beyond the scope of the surrebuttal.

CO-HEARING OFFICER DODUC: Ms. Taber?

MS. TABER: Again, I'm trying to test the reasonableness of Dr. Nader-Tehrani's assertion regarding Dr. Paulsen's choice in using the chloride factor in Guivetchi. So if Dr. Nader-Tehrani used a different factor, then I'd like to explore a little bit how those factors -- the results that those factors would produce. And he has provided a calculation in his testimony based on Dr. Paulsen's choice, so I think it's a fair question.

CO-HEARING OFFICER DODUC: Overruled.

MR. MIZELL: Just so I'm clear, so the scope of surrebuttal cross-examination includes reaching back to previous testimonies if the topics are the same? I would just like to know so I can develop better cross-examination questions.

MS. TABER: If I can comment, I'm not reaching back to the prior testimony, but I am testing his expert opinion in here, which I think is fair to --

CO-HEARING OFFICER DODUC: And questioning the validity of the opinion he's being offered.

MR. MIZELL: Within the case in chief?

MS. TABER: His opinion is that Dr. Paulsen has overestimated chloride concentrations. And so, again, I think -- he's acknowledged that there is no specific factor for Stockton's location.

CO-HEARING OFFICER DODUC: Enough, enough. Move on, please.

MS. TABER: Thank you. So, again, Dr. Nader-Tehrani, is this the chloride conversion factor that DWR used to convert EC to chloride in the presentation of chloride results in DWR's case in chief?

WITNESS NADER-TEHRANI: With respect to the testimony that Dr. Bryan used, I don't know. With respect to information that we generated for Rock Slough or Antioch this may have been, it looks familiar, but I'm not hundred percent sure.

MS. TABER: Okay. Who would know the answer to that?

WITNESS NADER-TEHRANI: My staff, because they developed this.

MS. TABER: And so this conversion's specific factor is for the Rock Slough location, correct?

WITNESS NADER-TEHRANI: Yeah, this would not apply to City of Stockton's intake.

MS. TABER: And this document DWR-509 indicates that this conversion applies where sea water is the major source of salinity, correct?

WITNESS NADER-TEHRANI: Yeah, that's correct.

MS. TABER: Is sea water the major source of

salinity at Stockton's intake location?

WITNESS NADER-TEHRANI: It is one source. As I showed yesterday, my fingerprinting analysis, I showed Figure -- if you refer to Figure 3 in the Exhibit DWR-932, it clearly shows the Martinez contribution. If you can -- can do you that, please, Figure DWR-932.

CO-HEARING OFFICER DODUC: I don't think we need to go into that.

MS. TABER: I don't think we need to spend time going through that, Dr. Nader-Tehrani. In fact, if you just -- is it fair to characterize sea water as the major source of salinity at Stockton's intake location?

WITNESS NADER-TEHRANI: I would not call it the main source. It depends on what season. And there are some months where it could be.

MS. TABER: Thank you. So did DWR use the same conversion factor here, in DWR-509, for all locations in the Delta for which analysis was provided in the case in chief?

CO-HEARING OFFICER DODUC: Now you're really pushing the limits, Ms. Taber. Would you like to revise that to be more directly focused on your premise of testing Dr. Nader-Tehrani's opinion that is in his

surrebuttal testimony?

MS. TABER: Well, I think it goes to the question of the reasonableness of the choice. If there's no chloride factor at Stockton's location, if he -- specific factor and they used the same factor at every location in the Delta, then that would call into question his testimony criticizing Dr. Paulsen's choice to use one factor over another.

So it's -- I think it's a fair question for him to answer, whether or not they used the same factor at different locations where circumstances are different.

CO-HEARING OFFICER DODUC: All right. I'll give you that one last --

MS. TABER: That's my last question.

CO-HEARING OFFICER DODUC: Dr. Nader-Tehrani, answer if you are able to.

WITNESS NADER-TEHRANI: As far as I know, the information that we shared for chloride was mostly at Rock Slough, Contra Costa Canal, or Antioch for chloride. And so for those locations, sea water intrusion was, you know, the main source of chloride. And that's -- if that's the equation that was used, that would have been appropriate.

The only two documents that I know -- that I

recall was City of Stockton, and that would be Dr. Bryan's testimony and mine. I can comment on what I've used. I don't know what Dr. Bryan's --

MS. TABER: Thank you. Fair enough. Just a few more questions.

If we -- I don't think we should switch exhibits right now; it will be confusing.

Dr. Nader-Tehrani, in your testimony, DWR-932, at Page 9, Lines 25 to 27, you calculate chloride for an EC value of 650 microsiemens per centimeter using conversion equations from Stations 16 and 17 from Guivetchi.

WITNESS NADER-TEHRANI: I'm sorry. What page again?

MS. TABER: Page 9, Lines 25 to 27, you provide an example that you --

WITNESS NADER-TEHRANI: Yes.

MS. TABER: -- to support your conclusion that Dr. Paulsen had overestimated chloride concentration.

So using the conversion for Station 16, you calculate 124.8 milligrams per liter chloride. And using the conversion for Station 17, you calculate 108.1 milligrams per liter.

Dr. Nader-Tehrani, could you calculate -- please calculate the chloride concentration that

corresponds to an EC value of 650 using the equation in DWR-509 that we just discussed? And I can give you a hard copy of that if you'd like to see it, or we could -- why don't we put it, also, up on the screen. Go back to DWR-509 so he can -- so again, using a -- the same chloride calculation that you used in your testimony, are you able to do that?

WITNESS NADER-TEHRANI: In my head, no.

MS. TABER: Would you like a calculator to do that? I can give you one.

WITNESS NADER-TEHRANI: Sure.

MS. TABER: Okay.

CO-HEARING OFFICER DODUC: And Ms. Taber, help me understand here where you're going other than testing Dr. Nader-Tehrani's mathematical skills.

MS. TABER: Well, I'd like to compare -- the -- I'm sorry. You can tell it's been a while since I've done any real math because of my old calculator.

CO-HEARING OFFICER DODUC: I'm impressed that you actually have a calculator. I would use my iPhone.

MS. TABER: Well, I -- I wasn't -- I was afraid it might make noise. So I figured the calculator was safer.

CO-HEARING OFFICER DODUC: Actually, if you had an iPhone you could probably ask Siri to do a

calculation.

MS. TABER: Indeed I could. But I'm more interested in Dr. Nader-Tehrani's calculation because it relates to, again, the reasonableness of his conclusion about -- that Dr. Paulsen overestimated chloride conversions when she chose one particular chloride conversion factor.

WITNESS NADER-TEHRANI: So based on that equation, I get a number 135.

MS. TABER: Great. That's what I got. So I'm proud of myself that I was able to do that.

So Dr. Nader-Tehrani, your calculation then actually shows that, for an EC of 650 -- which was what you used in your testimony -- Dr. Paulsen's conversion yields lower chloride than DWR's; is that correct?

WITNESS NADER-TEHRANI: Once again, the information you see here clearly does not apply to Stockton.

MS. TABER: Okay. But it is lower than -- her numbers were lower than what would have been obtained had the DWR factor been used?

MR. MIZELL: Objection, misstates the testimony.

CO-HEARING OFFICER DODUC: Hold on.

But, Ms. Taber, if it doesn't apply to

Stockton, I'm not --

MS. TABER: He has stated that there is no factor that applies and that there's a discretion in which factor to apply in calculating chloride levels at that location. DWR used one factor in its case in chief. And unfortunately, Dr. Bryan isn't here to answer questions about the choice that he made in calculating results specific to Stockton. But with regard to Dr. Tehrani's example, I have asked him to calculate the chloride value using DWR's own number. And we can compare those and consider that in light of his conclusion that Dr. Paulsen has overestimated chloride concentrations.

MR. MIZELL: And, again, that description just misstates his testimony further.

Dr. Nader-Tehrani has qualified the use of this formula twice now in response to questions by Ms. Taber. To characterize this as DWR's formula for always calculating EC is incorrect and disingenuous.

CO-HEARING OFFICER DODUC: Rephrase that, then, Ms. Taber.

MS. TABER: Is the calculation that you just achieved -- the number that you just achieved for chloride using the DWR factor higher or lower than the number that Dr. Paulsen achieved using her choice of

Guivetchi Station 16?

MR. MIZELL: Objection, relevance.

CO-HEARING OFFICER DODUC: It's obviously higher.

WITNESS NADER-TEHRANI: Higher. But as I said, this does not apply to Stockton.

CO-HEARING OFFICER DODUC: All right.

MS. TABER: So, Dr. Nader-Tehrani, if you were to calculate chlorides at Stockton's intake, which factor would you use?

WITNESS NADER-TEHRANI: I would not use this one for sure. I would use both Stations 16 and 17. And based on my analysis I concluded that the information from Station 17 would be closer to what I expect to happen at City of Stockton's intake.

MS. TABER: Okay. But you don't know if Dr. Bryan used your method in preparing his results, correct?

MR. MIZELL: Objection, goes beyond the scope of surrebuttal.

CO-HEARING OFFICER DODUC: Sustained.

MS. TABER: Okay. Thank you.

That's all I have. Thank you.

CO-HEARING OFFICER DODUC: Mr. Emrick, please come up. And I believe you had given us a teaser,

yesterday, that you will be making some sort of motion. And you tempted me with a much shorter time estimate as well. I think that your range was like ten to 30 minutes or something like that.

MR. EMRICK: Yeah, let me state for the record, Matthew Emrick, City of Antioch.

Sure, I'll get right to it.

CROSS-EXAMINATION BY MR. EMRICK

MR. EMRICK: Why don't we put up Dr. Tehrani's surrebuttal testimony, DWR-932. And if we can go to the first opinion he has with respect to the City of Antioch.

Dr. Tehrani -- Nader-Tehrani states that CWF's scenarios H3, H4, and Boundary 2 result in similar or fewer number of days of chloride concentrations greater than 250 at -- parts per million at Antioch compared to no action alternative. CWF scenario Boundary 1 is not representative of scenarios H3, H4, and Boundary 2.

My motion is this: This is the exact same testimony that Dr. Tehrani gave in his rebuttal, and they have just simply moved it to their surrebuttal.

There's nothing new here, he's going to talk about that Dr. Paulsen concentrates on Boundary 1. They've actually cross-examined Dr. Paulsen on that during rebuttal. And there's absolutely nothing new,

and it's been stated -- what's in here has been stated in their opening and in rebuttal.

CO-HEARING OFFICER DODUC: So your motion is to obviously --

MR. EMRICK: To strike.

CO-HEARING OFFICER DODUC: -- not strike just the sentences you just read but the entire section?

MR. EMRICK: The entire section, the entire opinion.

CO-HEARING OFFICER DODUC: Response, Mr. Mizell?

MR. MIZELL: Yes. This section is directly responsive to testimony submitted on rebuttal by Dr. Paulsen. And to the extent that Dr. Paulsen was simply reiterating what she put in her case in chief, we are responding to it again.

So it's properly within the scope of surrebuttal. Certainly the Board can weigh it as less illuminating than it might otherwise be, but I believe that he characterizes it in more succinct terms and in clearer focus in response to rebuttal testimony presented by Dr. Paulsen.

MR. EMRICK: And I would argue that he had his opportunity to -- that is, when he made his rebuttal testimony and it was identical to this, that was his

opportunity to put in this information. He doesn't get two bites of the apple to basically restate what he stated on rebuttal in surrebuttal. It's almost identical. I can take you through the PowerPoints, and it's almost as though they were recycled. It's essentially the same testimony.

MR. MIZELL: If I may, the Department has an opportunity to respond to anything that's put forward in rebuttal. Dr. Paulsen submitted evidence that we are responding to. To the extent that it is not a carbon copy, I would say it has a way of further illuminating certain things to the Board.

In fact, the chart on Page 2 in this section is a new chart, calculating data in a clearer way in response to the arguments raised by Dr. Paulsen in her rebuttal testimony.

CO-HEARING OFFICER DODUC: All right. Enough.

Mr. Bezerra?

MR. BEZERRA: Yeah, just one brief comment in support of Mr. Emrick. Yesterday, the Department and the Department of Interior were more than aggressive in objecting to cross-examination questions of Ms. Parker as going into past testimony and it was inappropriate to do on surrebuttal.

And now we have here testimony that apparently

essentially repeats rebuttal testimony that the Department is offering as surrebuttal. We have rather inconsistent positions from DWR and Reclamation on this position.

CO-HEARING OFFICER DODUC: Enough. I have listened to all your arguments. Mr. Mizell, however, is correct. My reading of Dr. Nader-Tehrani's surrebuttal testimony is that he is responding to Dr. Paulsen's rebuttal testimony.

So, Mr. Emrick, as much as I hate to not to be able to short cut your cross-examination, your mention is denied.

MR. EMRICK: Thank you.

Then I'm going to ask some very similar sounding questions.

Again, as you've been asked previously, you -- we're going to start with Dr. Paulsen and her focus on Boundary 1.

You do recall Ms. Jennifer Pierre, in response to a question by Mr. Tim O'Laughlin, asking how he could explain or how he could determine the impacts of the WaterFix project on his clients' water rights; and Ms. Pierre testified -- and I've got her testimony. Page 152 of the transcript from July 29th, 2016.

Hearing Officer says:

"Ms. Pierre, answer to the best of your ability. You do not have to try to read Mr. O'Laughlin's mind. I will not subject you to that.

CO-HEARING OFFICER DODUC: Apologies, Mr. O'Laughlin.

MR. EMRICK:

"Witness Pierre: I would evaluate the effects of Boundary 1 and the effects of Boundary 2."

CO-HEARING OFFICER DODUC: I'm sorry, Mr. Emrick. I have now lost track of your question since I was, as always, mesmerized by any mention of Mr. O'Laughlin.

MR. EMRICK: So I read Ms. Pierre's response, which is, "I would evaluate the effects of Boundary 1 and the effects of Boundary 2."

And my question is, you're aware of that testimony, are you not?

WITNESS NADER-TEHRANI: I don't recall. I wasn't --

MR. EMRICK: Do you agree with Ms. Pierre?

WITNESS NADER-TEHRANI: I don't have an opinion.

MR. EMRICK: And, again, asking a similar questions that's been asked before, there's nothing that's been offered by the Department of Water Resources that would limit operations of the WaterFix project to 4A, H3, and H4, is there?

CO-HEARING OFFICER DODUC: Yes, asked and answered.

MR. MIZELL: Objection.

MR. EMRICK: Actually, that's why I wanted to strike this testimony because much of it has already been asked and answered.

On Page 2 of your testimony, Lines 10 through 12, you state:

> "It should be mentioned that that exceedance of the 250 parts per million chloride concentration at Antioch is not considered an exceedance of D1641 water quality objective provided that the threshold is met at Contra Costa Canal."

Do you see that?

WITNESS NADER-TEHRANI: Yes, I do.

MR. EMRICK: And that's because DWR doesn't operate D1641 at Antioch; is that correct?

WITNESS NADER-TEHRANI: I think the D1641 objective is clear as far as this particular one is concerned, and it only applies to Contra Costa Canal.

MR. EMRICK: But do you understand that DWR could operate to Antioch under D1641 but has chosen not to?

MR. MIZELL: Objection --

CO-HEARING OFFICER DODUC: Yes, go ahead, Mr. Mizell. Objection?

MR. MIZELL: Objection, goes beyond the scope of the surrebuttal. Also, this is beyond his expertise. He is not an operator. He's a modeler.

CO-HEARING OFFICER DODUC: Sustained.

MR. EMRICK: Do you understand that the 1968 agreement between Antioch and the Department of Water Resources uses a 250-parts-per-million threshold for chloride?

WITNESS NADER-TEHRANI: I'm familiar with the document. Yes.

MR. EMRICK: Are you familiar with that it provides a 250-parts-per-million chloride threshold?

WITNESS NADER-TEHRANI: That's correct.

MR. EMRICK: I'm going to move on to your

second opinion with regard to Antioch, and I believe that's Page 3.

And this has to do with the settlement agreement between the Department of Water Resources and Contra Costa Water District, CCWD. You cite to some excerpts from the Final EIR for the WaterFix. For instance, you cite to 31B2.3, which is on Page 4, Line 8.

Is that page in evidence?

MR. MIZELL: We've been over the citations used for the Final EIR/EIS. Once the document is finalized, it will be SWRCB-102. The final document has been available to the public for quite some time now. And we've provided citations that will allow the public and the Board to locate these citations in the document as it's been available to the public.

CO-HEARING OFFICER DODUC: So is that an objection to the question?

MR. MIZELL: It is an objection to the question.

MR. EMRICK: My understanding was that, to the extent there was going to be a citation, that the actual page would be provided as supporting evidence for this hearing.

MR. MIZELL: If it's the Board's preference

that the Department produce miscellaneous pages from the Final EIR/EIS, we are more than welcomed to do that.

CO-HEARING OFFICER DODUC: That is not necessary because it is available, so the objection is sustained.

MR. EMRICK: For your second opinion with respect to Antioch, you claim that Dr. Paulsen is wrong in her assertions that there's not enough information presented in the Final EIR with respect to the CCWD settlement agreement on Antioch; is that correct?

WITNESS NADER-TEHRANI: That's correct.

MR. EMRICK: I just have a few questions here. Did you or anybody else re-operate CalSim II to simulate the operations with the Contra Costa mitigation agreement?

WITNESS NADER-TEHRANI: I don't know.

MR. EMRICK: Do you know whether those were post-processed?

WITNESS NADER-TEHRANI: I did not do the analysis, and I don't know.

MR. EMRICK: So you did not do the analysis on the Final EIR or on the CalSim?

WITNESS NADER-TEHRANI: With respect to this specific CCWD agreement, I did not do the analysis; I

don't know how it was done.

MR. EMRICK: Then how can you state, if I could ask, how could you state that she's wrong in her assertions that there's wasn't enough information presented in the Final EIR if you didn't do it?

WITNESS NADER-TEHRANI: I'm just relying on the EIR appendix information presented in Appendix 31B. I'm clearly stating that there was enough information there for City of Antioch and a lot of other locations. You know, based on that information, it's my belief that this agreement does not affect, you know, water quality in a negative way at Antioch and those other locations listed.

MR. EMRICK: Well, I guess I would move to strike, then, the entire opinion if he didn't do any analysis himself to come up with this opinion. He says he's just relying on what's written in the EIR, the Final EIR.

CO-HEARING OFFICER DODUC: I believe we have ruled on such objection, but I will allow Mr. Mizell to officially provide his thoughts for the record.

MR. MIZELL: Certainly I object. And as we have said many times, experts are allowed to rely upon the work of others. The Final EIR/EIS is a document that's reliable in the Department's eyes, and

Dr. Nader-Tehrani has relied upon that to form his opinion. That is all within the scope that an expert can and should testify about.

CO-HEARING OFFICER DODUC: Thank you.

Motion denied, Mr. Emrick.

MR. EMRICK: Thank you. I would just want to clarify then for the record, though, that, again, that Mr. Tehrani didn't do his own independent analysis; he's relying solely what's on the -- in the Final EIR, if that's correct.

CO-HEARING OFFICER DODUC: I believe he's already answered that question.

MR. EMRICK: Okay. Thank you.

Dr. Nader-Tehrani, did you evaluate the Contra Costa Water District settlement agreement for Boundary 1 operation scenarios?

WITNESS NADER-TEHRANI: I'm trying to recall what -- sorry. I'm trying to recall what alternatives were -- I believe there were -- only a few of the alternatives were examined in this particular appendix. But based on my understanding of the hydrodynamics and the specifics of this agreement, I would -- it would be my belief that, with respect to implementation of this agreement in any of the alternatives, the effects would be similar, which would be negligible in terms of

effects on water quality.

MR. EMRICK: But you don't know as you sit here today whether or not Boundary 1 was evaluated with respect to the CCWD agreement?

WITNESS NADER-TEHRANI: I don't think it was.

MR. EMRICK: Do you know whether or not Boundary 1 was operated with CalSim with respect to the CCWD agreement?

MR. MIZELL: Objection, beyond the scope of Dr. Nader-Tehrani's surrebuttal. He speaks to DSM-2, not to CalSim.

CO-HEARING OFFICER DODUC: Sustained.

MR. EMRICK: Did you evaluate the impacts of the CCWD settlement agreement on a daily or weekly time scale?

WITNESS NADER-TEHRANI: As I stated, I didn't do the analysis.

MR. EMRICK: Do you know whether it was done on a daily or weekly time scale?

WITNESS NADER-TEHRANI: I believe based, on the results I see, the daily results were used, and then the exceedance plots were generated based on monthly averaged results.

MR. EMRICK: How about any evaluation that you're aware of with respect to the CCWD agreement

regarding different water year types?

WITNESS NADER-TEHRANI: The exceedance plots clearly goes through all water year types, from the very wet to very dry. And it clearly shows that there is very little change across the board.

MR. EMRICK: And how about with respect to cumulative impacts with respect to the impacts of CCWD agreement with respect to Antioch? Did you do any analysis with respect to cumulative impacts of the South Delta Improvements Program?

WITNESS NADER-TEHRANI: I'm not sure what you mean by "South Delta improvement program."

MR. EMRICK: You're not familiar with that?

WITNESS NADER-TEHRANI: I'm not sure what specifically you're referring to.

MR. EMRICK: Well, there's a DWR project I think we had Dr. -- or Mr. Leahigh testify, or somebody did on that panel, that the South Delta Improvements Project, which involves, I believe, some gates down on Old River and some operating criteria.

CO-HEARING OFFICER DODUC: And since that's -- I don't recall seeing that as part of his surrebuttal testimony.

MR. EMRICK: Well, what I'm -- the point I'm trying to make is that he's saying that Dr. Paulsen is

wrong in her assertions, there's not enough information.

What I'm trying to show is that they didn't evaluate Boundary 1. They also didn't evaluate cumulative impacts of other projects that are still active and will be eventually constructed or at least considered by DWR and what the cumulative impacts of the WaterFix project with these projects would have in operating the Contra Costa Water District agreement on City of Antioch's water supply.

CO-HEARING OFFICER DODUC: And?

MR. EMRICK: And those agreements are the South Delta Improvements Program; he seems to not know that. Franks Tract Project.

MR. MIZELL: Is this the point where I object?

CO-HEARING OFFICER DODUC: Yes, it is.

MR. MIZELL: I object, it's beyond his surrebuttal testimony.

CO-HEARING OFFICER DODUC: It is sustained.

MR. EMRICK: California EcoRestore?

MR. MIZELL: Objection.

CO-HEARING OFFICER DODUC: Sustained for now. You will have a chance to --

MR. EMRICK: Let me ask for --

CO-HEARING OFFICER DODUC: -- provide input on

the whole restoration cross-examination pathway that Ms. Taber conducted yesterday.

MR. EMRICK: Let me ask it a little different.

In doing your analysis, did you consider the impacts cumulatively of any other projects that may be constructed or are planned in the western Delta with respect to cumulative impacts and impact to Antioch from the operation of the CCWD settlement agreement?

MR. MIZELL: Objection, vague and ambiguous as to what analysis Mr. Emrick is referring to. It should be limited to the analysis performed for surrebuttal, not any and all analyses ever done for California WaterFix.

MR. EMRICK: Did you consider any other projects at all in your analysis or in making your opinion that the CCWD agreement will have minimal impact on the City of Antioch under the 4A scenario?

MR. MIZELL: Objection, only to the extent that he is seeking an answer beyond the surrebuttal.

CO-HEARING OFFICER DODUC: And only answer, Dr. Nader, with respect to the testimony you provided in surrebuttal, which I believe Mr. Emrick pointed out earlier.

WITNESS NADER-TEHRANI: I mean, Mr. Emrick asked about South Delta, so the only one I know,

remember, was the Head of Old River Gate. And that has been included in all the modeling that has been done. So that's an example of what's included.

I am not sure what else Mr. Emrick is specifically referring to "other projects' cumulative impacts."

MR. EMRICK: That's all I have.

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

I believe Mr. Ruiz -- actually, let me check with the court reporter.

(Discussion off the record)

CO-HEARING OFFICER DODUC: All right. Then, Mr. Ruiz, you're up. Mr. Ruiz has estimated 40 minutes. So let me inform Mr. Ruiz that I would like to take a break before 40 minutes. So at a natural stopping point, sometime between -- sometime in the next half an hour, please let me know, and we will take a 15-minute break for the court reporter then.

MR. RUIZ: I have sat through the other cross-examinations of Dr. Tehrani.

CO-HEARING OFFICER DODUC: Sat through? You have enjoyed and have been mesmerized by it.

MR. RUIZ: I have been benefited by them to the extent that my cross-examination is significantly

shorter.

CO-HEARING OFFICER DODUC: Okay.

MR. RUIZ: So I'm thinking it's 20 minutes, if that.

CO-HEARING OFFICER DODUC: Perfect. And we'll take our break then.

CROSS-EXAMINATION BY MR. RUIZ

MR. RUIZ: So for the record, Dean Ruiz, South Delta Water Agency parties. Good morning, Dr. Tehrani.

Do you want my topics, even though I'm 20 minutes?

CO-HEARING OFFICER DODUC: Please, it's helpful to me.

MR. RUIZ: Topics -- couple of questions on each of these topics: water levels related to the North Delta diversion versus Head of Old River barrier, the basic role of Old River barrier in the modeling; Dr. Tehrani's testimony with regard to his opinions that Dr. -- or Mr. Burke inappropriately used DSM-2 through 15-minute daily time steps; quick question regarding Dr. Tehrani's claim that Mr. Burke didn't do water quality analysis; quick question regarding whether the Head of Old River barrier is included in the no action alternative during the spring months; and just a couple questions on water levels related to the

temporary ag barriers.

CO-HEARING OFFICER DODUC: Thank you.

MR. RUIZ: Dr. Tehrani, yesterday I noticed on Page 26 of your PowerPoint, which I think is DWR-944, you indicated that water levels in the South Delta are not affected by the proposed North Delta diversions. And on Page 15 of your surrebuttal testimony, you indicate that water level changes in South Delta are mainly attributed to the Head of Old River under scenario Alternative 4A as compared to the no action.

So I have a couple questions with regard to that. To me, that implies that something other than the Head of Old River barrier is affecting water level changes in the North -- in the South Delta.

Is that your opinion?

WITNESS NADER-TEHRANI: Can you specify the line numbers you're referring to, please?

MR. RUIZ: Yes. I'm looking at -- on Page 15, I'm looking at starting at Line 1 and 2. You say, "It's my opinion that any water level that changes in the South Delta is mainly attributed to a difference in the operation of Head of Old River Gate." Do you see that?

WITNESS NADER-TEHRANI: Yes, I do.

MR. RUIZ: And when -- you say "mainly," but

you also say they are not affected. I'm trying to understand the difference that you're getting to.

WITNESS NADER-TEHRANI: I just wanted to make it clear that the -- the operation of the North Delta diversions do not affect water levels in South Delta. And the water level changes that are seen by the model in South Delta are mainly attributed to the Head of Old River operation -- Gate -- difference in the Head of Old River Gate operation.

MR. RUIZ: Okay. Thank you. When you say "mainly," that implies there's something else in addition to that that's causing the impact or the result. What else are you referring to?

WITNESS NADER-TEHRANI: For example, the pumping rate in South Delta are somewhat different between the two, no action and the specific California WaterFix alternatives.

MR. RUIZ: Is there anything else?

WITNESS NADER-TEHRANI: Not off the top of my head.

MR. RUIZ: Okay. So just so I'm clear for my understanding, so I don't have -- won't have to have additional questions on it, it's difference in water level pumping in the South Delta in addition to the North Delta diversions that are causing impacts, water

level impacts, in the South Delta?

WITNESS NADER-TEHRANI: I was just saying the North Delta diversions, it's my opinion they are not affecting water levels. And the main -- the biggest cause of change in water levels in South Delta are attributed to Head of Old River. All others are very minor -- cause very minor changes.

MR. RUIZ: Okay. Thank you. And the Head of Old River barrier is obviously part of the California WaterFix scenarios, correct?

WITNESS NADER-TEHRANI: That's correct.

MR. RUIZ: And is part of the project that's being presented to the Board, correct?

WITNESS NADER-TEHRANI: That has been included, yes.

MR. RUIZ: Are you suggesting somehow that the Head of Old River barrier is -- is causing impacts or the impacts from the Head of Old River barrier on water levels is insignificant because it's not what might be classified as a primary feature of the project as compared to the North Delta diversions?

MR. MIZELL: Objection, goes beyond the scope of his surrebuttal testimony. He made his analysis as to whether or not there's a distinction to be made between impacts driven by the Head of Old River barrier

and the North Delta diversion points, not about whether or not the Head of Old River barrier is a significant or key portion of the project.

CO-HEARING OFFICER DODUC: Mr. Ruiz?

MR. RUIZ: I'll move on.

CO-HEARING OFFICER DODUC: Thank you.

MR. RUIZ: Just got a couple questions for you now, Dr. Tehrani, about your critique of Mr. Burke's use of DSM-2 to analyze daily time steps and 15-minute time steps on water level changes.

The DSM-2 model was developed in part with the capacity or the ability to produce time steps as small as 15 minutes; is that correct?

WITNESS NADER-TEHRANI: Yes.

MR. RUIZ: Have you used DSM-2 to analyze daily time steps or even 15-minute time steps as part of your analysis of the CWF for these proceedings?

MR. MIZELL: Only objection to the extent it seeks answers beyond the surrebuttal testimony.

CO-HEARING OFFICER DODUC: Mr. Ruiz?

MR. RUIZ: I'm simply asking him -- he's indicated that Mr. Burke has inappropriately used these time steps. I think I've heard -- I think, but this stuff, it gets confusing still to me.

I think I've heard Mr. Tehrani speak of using

the daily time steps as part of conducting, preparing some exceedance plots with regard to his testimony even in the last day or so. So I'm just trying to clarify that.

CO-HEARING OFFICER DODUC: Right.

Overruled.

WITNESS NADER-TEHRANI: As far as the information that's shown on Lines 7 to 10, it has -- I have mentioned before that it is my opinion that it's inappropriate to use -- to compare model results based on a given day of simulation.

Now, in order to use exceedance plots probably -- you know, probability exceedance plots, you have to use these 15-minute or daily results in order to generate those plots. So all of those information are reflected in -- in that -- those types of exceedance plots.

It's just incorrect, in my opinion, inappropriate to compare a specific 15-minute value of the model output to another from one scenario to the other. And that's what I'm saying is inappropriate.

MR. RUIZ: I appreciate that. But just so I can get clear for the record, you have used daily and 15-minute time steps as part of your analysis for these proceedings, correct?

WITNESS NADER-TEHRANI: I used that information to generate the, you know, exceedance plots and so forth, so that is appropriate, yes.

MR. RUIZ: Thank you. You indicated in your surrebuttal testimony that Mr. Burke -- you critiqued Mr. Burke for failing to -- in your words, not include any water quality plots. Do you recall that?

WITNESS NADER-TEHRANI: Yes.

MR. RUIZ: You're aware that Mr. Burke provided an extensive analysis of water quality plots and impacts as part of his case-in-chief testimony?

WITNESS NADER-TEHRANI: I was -- my critique of Mr. Burke is he was using flushing flows as a surrogate for water quality, and the two, in my opinion, are not synonymous.

MR. RUIZ: My question is are you speaking of in his surrebuttal testimony or in his previous rebuttal or case in chief testimony?

WITNESS NADER-TEHRANI: I was referring to South Delta Water Agency Exhibit 257, which is his rebuttal testimony.

MR. RUIZ: Okay. My question is -- I think it's pretty simple -- you're aware that he did, Mr. Burke did provide water quality plots and analysis as part of SDWA-47, his case-in-chief technical report

you're aware of that?

WITNESS NADER-TEHRANI: That, I'm aware, yes. But, again, my main critique of this is in Mr. Burke's rebuttal testimony, he's commenting on water quality, but yet he's not basing it on any water quality analysis, specific water quality analysis he did for the rebuttal testimony.

MR. RUIZ: Would you agree that the thrust or the focus of Mr. Burke's surrebuttal testimony is water levels and stage rather than water quality?

CO-HEARING OFFICER DODUC: Surrebuttal?

MR. RUIZ: I'm sorry, yes.

His rebuttal testimony?

WITNESS NADER-TEHRANI: I see plots of -- of water levels. I see plots of flushing flows. And I see reference in Mr. Burke citing differences in flushing flow and attributing to water quality. And so that's what I was commenting here.

MR. RUIZ: All right. Thank you. I've got a couple questions now for you, Dr. Tehrani, with regard to your critique of Dr. Burke concerning the -- whether or not the Head of Old River barrier is included in the spring in the no action alternative.

You've indicated -- well, first of all, let me ask you, are you certain that the Head of Old River

barrier during the spring is not assumed to be in place as part of the modeling for the no action alternative?

WITNESS NADER-TEHRANI: Yes, I am.

MR. RUIZ: And despite whether or not Dr. or Mr. Burke -- despite whether or not there was any confusion in his testimony, written or on cross-examination, which I know you refer to in your surrebuttal testimony, you're aware that Mr. Burke used the model inputs, DWR's model inputs, for the no action alternative in running the model?

WITNESS NADER-TEHRANI: That's what I understood he did.

MR. RUIZ: Okay. So whether or not the Head of Old River barrier is assumed in the model in the spring, whether or not it's -- it's either there or it's not in the model inputs, correct?

WITNESS NADER-TEHRANI: That's right.

MR. RUIZ: I'm going to refer you to Page 18 and 19 -- actually, Page 19 of your testimony. It's Lines 1 through 4. You discuss -- you discuss to some degree or at least part of your discussion pertains to the South Delta temporary ag barriers?

WITNESS NADER-TEHRANI: Yes, I see that.

MR. RUIZ: I just have a couple questions regarding that. It's your position, I believe, that

the temporary barriers are protective of water levels in the South Delta and would be protective even under the WaterFix scenarios with the Head of Old River barrier in place, correct?

WITNESS NADER-TEHRANI: I was just making a point that, when the agricultural barriers are in place, the minimum water levels are protected and are maintained at locations throughout South Delta that are located upstream of the ag barriers.

MR. RUIZ: Did you -- were you here, did you review Chip Salmon's testimony on rebuttal as far as SDWA-260?

WITNESS NADER-TEHRANI: I was not here.

MR. RUIZ: You haven't reviewed his testimony?

WITNESS NADER-TEHRANI: I might have, but I don't recall the specifics.

MR. RUIZ: I just have one question on it, and maybe you recall. Do you recall that Mr. Salmon testified that he could only divert at high tide, even during the months when the temporary barrier's been in place over the past couple decades?

WITNESS NADER-TEHRANI: That's not how -- you know, based on my understanding of the hydrodynamics in the Delta and the model results, I see that minimum water levels are maintained at the specific location

that I was citing over here.

MR. RUIZ: Do you have some reason to believe that Mr. Salmon was inaccurate in his testimony?

MR. MIZELL: Objection, Dr. Nader-Tehrani's indicated he's not familiar with Mr. Salmon's testimony, and that goes beyond the scope of the surrebuttal.

MR. RUIZ: I think he said that -- something to the effect he might recall. And I asked him a question to see if he'd refresh his recollection. And Instead of answering, he said it was inconsistent with his understanding of the hydrodynamics.

So I just wanted to ask him the question, do you have some reason to believe that Mr. Salmon was inaccurate in his testimony that he can't divert except on high tide even when the temporary ag barriers are in place?

CO-HEARING OFFICER DODUC: That is beyond the scope of his surrebuttal, sustained.

MR. RUIZ: Dr. Tehrani, are you aware that -- do you recall Mr. Burke's analysis in SDWA-257? And specifically I'm referring to -- I believe you've made some comments with regard to the hydrodynamics in the Delta, and you didn't believe that the type of water level impacts shown in SDWA Figures 6 through 8 are

consistent with your understanding of the dynamics when the temporary barriers are in place; is that a fair assessment?

WITNESS NADER-TEHRANI: Can you refer me to specific page and line numbers so I can see what I'm saying, responding to?

MR. RUIZ: Yeah. I'm looking at Page 19, and I'm looking at -- starting at Lines 2 through about Line 4. Do you see that?

MR. MIZELL: Mr. Ruiz, are you referring to Dr. Nader-Tehrani's testimony?

MR. RUIZ: I'm sorry. I was looking down. Yeah, I'm actually referring to your testimony, DWR-932.

Do you see that, Dr. Tehrani?

WITNESS NADER-TEHRANI: What line number?

MR. RUIZ: Lines 2 through 4. You say you think it's very unlikely to have water levels in the main reaches of the South Delta such as those depicted in SDWA-257, Figures 6 through 8. I'm just trying to get you -- just to reference you.

WITNESS NADER-TEHRANI: Yes, yes.

MR. RUIZ: And when is your understanding that the temporary ag barriers are in place? What months?

WITNESS NADER-TEHRANI: Based on past history,

they typically are installed late March, especially -- yeah, late March, April through November. That's my -- what I recall. And I could be wrong, you know, a few weeks.

MR. RUIZ: Sure.

This is my last -- my last question. Could we pull up SDWA-257 and Page 7, Figure 3. And referring to this figure, you say that the ag -- temporary ag barriers are in place between -- what did you say? March and --

WITNESS NADER-TEHRANI: April to -- through November. But what you're referring here is the modeling results.

MR. RUIZ: Right.

WITNESS NADER-TEHRANI: I was responding to what truly has happened in recent years.

MR. RUIZ: Right. And I just want to ask you if you've reviewed this figure from Mr. Burke.

WITNESS NADER-TEHRANI: I have seen this figure, yes.

MR. RUIZ: And you're aware that this figure indicates up to one- to two-foot drop during these water years that are shown here, 1992 and 1993, during the months when the temporary ag barriers are in place?

WITNESS NADER-TEHRANI: The modeling actually

assumes somewhat of a different schedule for the temporary ag barriers than what has happened in recent years.

MR. RUIZ: Does the modeling schedule assume they're in place between February and June, or February and July?

WITNESS NADER-TEHRANI: Not February, no. You're referring to Head of Old River Gate or ag barrier?

MR. RUIZ: I'm sorry. I was asking about the ag barriers. You said that the modeling assumes something different. What months does the modeling assume the temporary barriers are in place?

WITNESS NADER-TEHRANI: I believe they're -- and each ag barrier is slightly different in the model results. But I think the full closure of all barriers start from June -- yeah, June 1st, I believe. But I could be wrong a few weeks here or there.

So what you see here is that, once you get to the month of June, you clearly see those larger differences are the -- have disappeared. With that, it's my understanding of what -- the results of the ag barriers affecting water levels.

MR. RUIZ: Okay. I actually don't have any further questions.

CO-HEARING OFFICER DODUC: Thank you, Mr. Ruiz. You do Mr. Herrick proud.

All right. I believe that's all the cross-examination I have.

Mr. Mizell, do you have redirect, and if so, on what particular issues?

MR. MIZELL: Very short redirect on fingerprinting. I'm happy to do that now or after a break.

CO-HEARING OFFICER DODUC: I'm looking to the court reporter.

(Discussion off the record)

CO-HEARING OFFICER DODUC: Let's do it now. You have her permission.

MR. MIZELL: Very good.

REDIRECT EXAMINATION BY MR. MIZELL

MR. MIZELL: Yesterday, Ms. Taber asked you about criticisms of your Dr. Paulsen's fingerprinting analysis at Buckley Cove, criticism in your testimony; is that correct?

WITNESS NADER-TEHRANI: Yes.

MR. MIZELL: Can you explain how your criticisms of Dr. Paulsen's fingerprinting analysis is best understood?

WITNESS NADER-TEHRANI: Yes. If you could

please open Stockton Exhibit 26, pdf Page 57. There's no figure number. If you scroll up a little -- okay.

So Dr. Paulsen presents water quality fingerprints at two locations. One is at the Stockton's intake, and one is at Buckley Cove. And my testimony is that Dr. Paulsen's analysis of fingerprint at Buckley Cove is flawed but not at City of Stockton's intake.

So if you scroll down a little -- and maybe you can zoom in on that top four figures.

Okay. So this is an example of what I consider to be correct analysis. This is City of Stockton's intake, and I want to illustrate what is correct about it, and then I can go to Buckley Cove and show what's clearly incorrect.

CO-HEARING OFFICER DODUC: All right. Hold on.

Ms. Taber?

MS. TABER: Thank you. I'm going to object to this question because my questions were very focused and didn't include any discussion of the fingerprinting analysis of the City of Stockton's intake. This just goes well beyond the scope of my cross.

CO-HEARING OFFICER DODUC: Mr. Mizell?

MR. MIZELL: Certainly. He did answer

questions about Buckley Cove. And I've asked him to explain as best he can how his criticisms are best understood. And what he's trying to do here, I believe, is provide a counter example such that you can see a comparison between what is correct and what is incorrect.

We could certainly start with what is incorrect and then go back and show an example of what's correct. But it is all circled around the conversation that Ms. Taber had with Dr. Nader-Tehrani on Buckley Cove. We're not trying to prove anything about City of Stockton in and of itself.

MR. RUIZ: My questions were limited to, I think, two or three questions including whether there were any sources of water that were not reflected in the results that he depicted in his report -- or cited from Dr. Paulsen's report, whether there was EC-to-chloride conversion -- whether the fingerprinting results depended on EC-to-chloride conversation factor.

I don't believe I covered anything else, so anything other than those two particular questions I would again assert is beyond the scope of my cross.

MR. MIZELL: We will agree to limit it to just to first topic that Ms. Taber just raised, which is the sources of water that might contribute to EC at Buckley

Cove.

CO-HEARING OFFICER DODUC: At Buckley Cove.

MR. MIZELL: At Buckley Cove.

MR. TABER: Okay. I didn't understood that from the question that Mr. Mizell asked. It seemed to be far broader. So if I hear a more focused question on that, then perhaps I won't object.

MR. MIZELL: Certainly.

CO-HEARING OFFICER DODUC: Please do that, Mr. Mizell.

MR. MIZELL: Sure. Dr. Nader-Tehrani, can you please explain how your criticisms of Dr. Paulsen's fingerprinting analysis regarding the sources of EC shown in her graphs at Buckley Cove is best understood?

MS. TABER: I'm going to renew the objection.

CO-HEARING OFFICER DODUC: Actually, sounds like the exact same question.

MS. TABER: Seems to be.

And Dr. Nader-Tehrani's opinion was that he found the analysis flawed because the results presented did not add to a hundred percent. So I asked him if there were any other sources of water that were not reflected in that -- in those graphs. And he mentioned a couple of sources. He mentioned eastside streams and I'm not -- I can't remember what the other one was.

And that was the limit of my discussion, so I'm still not understanding how this responds to my cross.

CO-HEARING OFFICER DODUC: Unless Dr. Nader-Tehrani limits his response to Buckley Cove, I will sustain Ms. Taber's objection.

WITNESS NADER-TEHRANI: I can do that.

CO-HEARING OFFICER DODUC: All right. Let's try a second time, third time? Third time.

WITNESS NADER-TEHRANI: Okay. So if you scroll down five pages to Page 62. Can you scroll up one page now, just to show -- this is source water fingerprints at Buckley Cove. So scroll down now.

So this particular figure represents fingerprinting analysis done by Dr. Paulsen. And it represents -- can you scroll up one, a little? Okay. Yeah, all right.

So this is for critical water years. So you're comparing the results for NAA and EBC2 shown by NAA -- can you scroll down a little?

Yeah. NAA is represented by purple line. So once again, you do see a difference between -- you have a reduction of source, of volumetric contribution from all sources consistently under NAA compared to EBC2. So let's take a -- you know, and so what I explained

before is that, when you do see a reduction in one source, you would expect to see an increase in another source.

Now, but I was going to explain. So if you look at the month of July where there's a dip, and let's numerically add those numbers. So the bottom left plot is for San Joaquin River. That -- they both show about 30 percent.

So let's just look at the NAA results. So for July, so San Joaquin is, you know, contributing 30 percent, and then Sacramento is 20 percent. For the ag water, that's about 30 percent. You add all those three, and that ads up to 80 percent.

So there's 20 percent missing here. And I don't know any source -- none of the other sources I mentioned yesterday would account for this 20 percent missing mass. And that's what I was going to explain.

CO-HEARING OFFICER DODUC: Thank you.

MR. MIZELL: That concludes my redirect.

CO-HEARING OFFICER DODUC: Any recross?

(No response)

CO-HEARING OFFICER DODUC: All right. Not seeing anyone, I think you're all dying for a break.

I might have to turn to counsel for some guidance on this. Mr. Mizell, you had made a request

with respect to Mr. Davis. And we've given Ms. Womack and others the opportunity to comment and respond on that. You will be bringing a witness on Thursday to authenticate and answer questions on this spreadsheet that you made available earlier this morning.

So with respect to moving things into the record, should we wait until then? Or is now the appropriate time?

MS. HEINRICH: It's my understanding that -- are there any exhibits associated with the witness that you're providing later next week that are -- that DWR is offering into evidence?

MR. MIZELL: The order asked us to produce a spreadsheet. We have not marked it as an exhibit for DWR. However, depending upon how the cross-examination goes, we may very well want to mark it at some point and enter it into evidence. So there is the possibility, although at this time we would not.

MS. HEINRICH: In that case, it might make sense to wait.

CO-HEARING OFFICER DODUC: Okay. Ms. Meserve?

MS. MESERVE: Osha Meserve for LAND. I would agree it would make sense to wait. There's also been an objection received via e-mail, so.

CO-HEARING OFFICER DODUC: All right.

Mr. Bezerra?

MR. BEZERRA: Yes, thank you. Related to that point, I don't have an understanding as to when the Department of Interior plans to introduce they are exhibits from yesterday into evidence. I was assuming they would come along with DWR's package. But it sounds like DWR has quite a bit more material to offer.

I have an objection to DOI's exhibits. I could do that today; I could do it when they're offered.

CO-HEARING OFFICER DODUC: Ms. Aufdemberge, if the Department of Interior's surrebuttal is concluded, and you have no additional witnesses or exhibits to offer, I would suggest we at least -- actually, one of your -- Ms. Parker's testimony was supported by Mr. Reyes's testimony, which is an DWR exhibit.

MS. AUFDEMBERGE: Yeah. I think that, because this is a joint petition and we have a joint case, that I was just anticipating submitting them at the end of the joint surrebuttal.

CO-HEARING OFFICER DODUC: I would prefer to wait for them to move their exhibits together, Mr. Bezerra.

MR. BEZERRA: Okay. So what I take from that is -- what I'll plan to do is file a written objection

so that it's in the record, and then they can respond to it as appropriate when they offer them. I believe that's how we've generally proceeded.

CO-HEARING OFFICER DODUC: If it is a simple enough objection that you can articulate verbally right now, you're welcome to do that for the record as well.

MR. BEZERRA: Can I do that immediately after the break?

CO-HEARING OFFICER DODUC: I think that is fair. Let's take a break, and we will return at 11:15.

(Recess taken)

CO-HEARING OFFICER DODUC: All right. It is 11:15; we are back in session.

And Mr. Bezerra.

MR. BEZERRA: Thank you very much. Yes, I'd like to lodge an objection to portions of Exhibit DOI-37 and also DOI-38 on the grounds that they violate this Board's original hearing notice for this hearing dated October 30th, 2015 as well as lacking foundation.

The portion of the hearing notice is on Page 33 and states, "The following requirements apply to exhibits. Exhibits based on technical studies or models shall be accompanied by sufficient information to clearly identify and explain the logic, assumption, developments, and operations of the study or models."

On that basis, I'm objecting to the admission of Pages 9 through 13 of DOI-37, all of which deals with CalSim allocation logic, as well as the entirety of Ms. Parker's technical appendix attached to DOI-37.

The basis for the objection is that petitioners refused to allow their witnesses to testify as to whether petitioners had adjusted the WSI DI curves in their modeling to account for climate change. As a result, there is no evidence in the record on that point, and each of these pieces of testimony contains and relies upon Biological Assessment modeling results that are intimately linked to the WSI DI curve.

You can flip through those pages. There's graphs showing WSI DI curve each. And every year discussed in the technical appendix contains a graph of CVP allocations in those years.

There is no evidence in this record, and petitioners refuse to allow evidence into this record, as to whether the WSI DI curve and Biological Assessment modeling has been adjusted to account for climate change. As a result, there are inadequate -- there's an inadequate explanation of the logic, assumptions, and development of that model, and those results should not be included in the record.

That objection also extends to Slides 8

through 13, 16 through 22, and 26 of Ms. Parker's PowerPoint, which is DOI-38, which contain a summary of the portions of testimony included in DOI-37 to which the objection applies.

CO-HEARING OFFICER DODUC: Mr. Bezerra, I think --

MR. BEZERRA: Yes?

CO-HEARING OFFICER DODUC: You've just changed my mind. I should have stuck with your initial inclination, which was to provide the objection in writing.

Given that it was somewhat complicated and lengthy, not as simple was I was expecting, we will go back to your initial suggestion, and I will request that you --

MR. BEZERRA: I can do that. I can offer another solution. The witnesses are here and could answer the question as to whether or not the WSI DI has been adjusted for climate change. That would moot the objection, and we could have the evidence in the record.

CO-HEARING OFFICER DODUC: Somehow, I don't think it will that easy, but Ms. Aufdemberge

MS. AUFDEMBERGE: Well, we already went there through this yesterday in that we -- this was resolved

yesterday because we had put the information about the WSI DI curve to show that it wasn't perfect foresight. And that was rebuttal of testimony by Mr. Bourez that WSI DI was a form of perfect foresight.

So we have already had a ruling on this that the questions that Mr. Bezerra were trying to ask were sustained, our objection was sustained at that point.

CO-HEARING OFFICER DODUC: I think now you've confused me because I heard something different from Mr. Bezerra.

MR. BEZERRA: The model results -- there are model results listed in the pages to which I have objected. They are based on the operations of a modeling apparently by Mr. Parker. And petitioners have refused to allow into the record evidence as to whether the WSI DI curve, which is the subject of much of this testimony, was adjusted to account for climate change.

So it is a result of their objections that there is no evidence in the record adequate to support this testimony under this Board's October 30th, 2015 hearing notice.

CO-HEARING OFFICER DODUC: Ms. Aufdemberge?

MS. AUFDEMBERGE: I would say that we need to go back to putting that in writing and allowing our

response in writing. If we're not understanding each other, I can't adequately respond at this point.

CO-HEARING OFFICER DODUC: And I'm also having trouble following, so I think it is best if you submit that in writing, Mr. Bezerra --

MR. BEZERRA: Thank you.

CO-HEARING OFFICER DODUC: -- by noon Monday. Sounds like you've already fleshed it out.

MR. BEZERRA: Yes, I can do that.

CO-HEARING OFFICER DODUC: As the Department, anyone else who wants to join in, could provide a response by noon on Tuesday.

MR. BEZERRA: Thank you.

CO-HEARING OFFICER DODUC: All right. At this point, why don't we go ahead and turn to Group 7, or at least for this first panel from Group 7. Ms. Nikkel, are you taking the lead?

MS. NIKKEL: Yes. Good morning, Meredith Nikkel on behalf of the entire group protestants in Group 7. First we're going to start with a brief opening statement that Aaron Ferguson will offer.

CO-HEARING OFFICER DODUC: All right.

MR. FERGUSON: Good morning, Aaron Ferguson on behalf of the Sacramento Valley Water Users in Group 7. I'm going to offer a rebuttal statement -- surrebuttal

opening statement on behalf of the group.

During the Part 1 rebuttal phase of this hearing, the California Department of Water Resources and the United States Bureau of Reclamation submitted evidence criticizing MBK's modeling techniques and MBK's modeling of discretionary actions by Central Valley Project and State Water Project operators with the California WaterFix in place.

On surrebuttal, the Sacramento Valley Water Users offered written testimony and exhibits prepared by Walter Bourez and Dan Easton of MBK that responds to petitioner's criticisms by addressing eight key topics. The testimony of Mr. Bourez and Mr. Easton will also respond to petitioners' rebuttal evidence regarding Term 91 curtailments.

In general, the surrebuttal testimony will show that the MBK modeling was conducted pursuant to a set of clear rules that do not unreasonably rely on any more foresight than the foresight utilized by project operators themselves. The testimony will also show that making manual adjustments according to a set of rules is an appropriate way to conduct an impact analysis.

Specifically, Mr. Bourez and Mr. Easton will testify that the use of foresight in CalSim II modeling

is commonly and widely accepted. MBK's use of foresight to develop export estimates is reasonable and aligns well with the ability of operators to actually forecast Delta exports. MBK's manual adjustments for the SWP reasonably assume that project operators will at times use the additional export capacity that the California WaterFix would provide. MBK's use of stored water in both the no action alternative and Alternative 4A is consistent with DWR's Oroville carryover policy. MBK consistently applied a general allocation logic to determine CVP allocations in the model.

It will also show the MBK followed consistent rules in modeling CVP use of State pumping facilities that are more conservative than actual recent operations.

It will also show MBK's modeling of the San Luis rule curve reflects the fact that the movement of water from upstream reservoirs is a discretionary action by operators and there's no legal limitation to prevent operations as depicted by MBK's modeling.

It will also show that use of generalized logic recommended by Mrs. Nancy Parker could result in more severe water supply effects than those presented in MBK's modeling.

And finally, the surrebuttal testimony will

show that Term 91 could be implemented more often with the California WaterFix in place.

In sum, the surrebttal testimony offered by the Sacramento Valley Water Users provides further evidence that MBK's modeling was conducted using a consistent set of logic and rules and that MBK's modeling of discretionary actions was consistent with historical project operations and operations that could be reasonably expected under operation of the proposed project. And furthermore, there are no physical or legal constraints that would prevent petitioners from operating the proposed project as modeled by MBK.

Thank you.

CO-HEARING OFFICER DODUC: Ms. Nikkel?

MS. NIKKEL: Thank you. We expect our direct examination will take 30 minutes, maybe a little bit longer. If it runs over, we'll address it when we get there. But we're doing our best.

CO-HEARING OFFICER DODUC: I would expect that.

In that case, then, just for everyone's general planning purposes, we will take our lunch break upon completion of your testimony presentation.

MS. NIKKEL: Okay. Thank you.

WALTER BOUREZ and DAN EASTON,

called as surrebuttal witnesses on behalf of Protestant Group 7, having been previously duly sworn, were examined and testified further as hereinafter set forth:

DIRECT EXAMINATION BY MS. NIKKEL

MS. NIKKEL: Mr. Bourez, you understand that you're presenting your testimony today under oath, correct?

WITNESS BOUREZ: Yes.

MS. NIKKEL: Is Exhibit SVWU-300 an accurate statement of your surrebuttal testimony in this proceeding?

WITNESS BOUREZ: Yes, it is.

MS. NIKKEL: And were Exhibits SVWU-302 and SVWU-303 prepared by you or at your direction to support your surrebuttal testimony?

WITNESS BOUREZ: Yes.

MS. NIKKEL: Mr. Bourez, do you have any typographical errors that you would like to correct for the record?

WITNESS BOUREZ: Yes, I have one. On SVWU-302 on Page 10, the last paragraph, second line refers to "Figure 1," and it should be "Figure 5."

MS. NIKKEL: Thank you. Mr. Bourez, did you

rely on Exhibits SVWU-304, 305, and 306 in reaching the opinions offered in SVWU-302?

WITNESS BOUREZ: Yes.

MS. NIKKEL: Mr. Easton, you understand that you are presenting your testimony today under oath, correct?

WITNESS EASTON: I do.

MS. NIKKEL: Is Exhibit SVWU-301 an accurate statement of your rebuttal [sic] testimony?

WITNESS EASTON: It is.

MS. NIKKEL: Mr. Bourez, Mr. Easton, would you please summarize your surrebuttal testimony using Exhibit SVWU-303?

WITNESS BOUREZ: Yes. If Mr. Hunt could go to Page 2, please.

So the criticisms really fall into two categories. One is our modeling techniques, and the other is discretionary actions within the model. And we're going to combine our responses because it's hard to separate the discretionary actions and the techniques. And then we'll follow up with a discussion of Term 91.

You can go to Slide 3, please.

So our responses fall into these categories: Use of foresight, annual export estimate adjustments

used in CVP and SWP allocations, manual export estimate adjustments made in SWP allocations and MBK Alternative 4A, model consistency with SWP Oroville carryover policy, MBK operational rules for manual CVP allocations, reliance on Joint Point of Diversion or JPOD, San Luis rule curve and upstream reservoir operations, and then lastly, use of generalized modeling logic.

So if we go to Slide 4, please.

So first we're going to talk about perfect foresight or use of foresight in the models. And the criticism centers around that MBK modeling used an unreasonable amount of foresight in modeling.

If we can go to Slide 5, please.

So use of foresight is common and reasonable in modeling. In CalSim, most allocations and standards are set with perfect knowledge of the water year. I'm not going to go through all of these, but I would like to touch on Bullets 2 and 3.

So allocations to the Sacramento River settlement contractors, Exchange Contractors, and refuge are based op Shasta inflow or Shasta criteria. And that is input to the model for all 82 years. We know exactly which years are Shasta critical and which are when the model runs.

And the same is true with the Feather River service area contracts. We know what allocations are going to be made before the model is run. So there's quite a number of other parameters that are set using perfect foresight. And we can go into as much as anybody wants to on this, but the bottom line is that we are all using perfect foresight in CalSim. Whoever's running the model is using it. And it is an acceptable modeling technique.

Go to Slide 6, please.

Next, we'd like to talk about annual export estimates used in CVP and SWP allocations, and criticisms focused on inappropriate use for planning model. With foresight in our modeling, we have more than the operators use in actual operations. And the petitioners claim that their modeling more accurately reflects project operations.

So if we can go to Slide 7, please -- I mean 8, if you could. I jumped one. Thank you.

So the use of export forecasts are very common in operations. And it's a technique that's used in the model. And when operators are in May, the question is what export volume should they use for making allocations south of the Delta.

So, you know, MBK does follow operations quite

a bit, and we have our own operations forecast tools. And so we're familiar with the process of developing these export estimates.

And what this chart shows is the blue bars are from the CALFED Ops Group May forecast of exports for the June through August period. And we started with 2009 because we had new Biological Opinions in '08. They started to learn how to use those and operate to those in 2009. And we just included 2013 because 2014 and 2015, with the CUPs and differences in operation, was really hard to come up with a comparison.

And one thing to notice is that those blue bars, those export estimates or forecasts are not the same every year. They vary more than a million acre-feet up or down. And this is just for the June through September period.

And the operators recognize the differences. And these export estimates are dependant upon how much storage is upstream, the hydrology, and numerous other factors. And Mr. Leahigh did a good job explaining what those factors are.

And we believe that the operators do a reasonable job in forecasting operations. Adjusting the export estimate as is done in actual operation doesn't mean that the modeling is wrong or not

comparable.

So I'd like to turn to the golden bars here. And those are the actual project exports that occur for the same period. So comparing the blue bars to those golden bars shows the difference between what's forecasted in May and what is actually exported by the projects through that summer period.

The brown bars are the amount of transfer pumping that occurs during that period. And there's reasons why 2009 is lower. They had unexpected or unforecasted fishery actions that curtailed exports more than expected. And as they started learning how to operate with the biological opinions, they got closer and closer. So 2011, we're close; 2012, we're close; 2013, we're close.

So the operators can do a reasonable job forecasting exports. And this is the method that we employed when we were looking at forecasting the May through August period. We developed rules based on our knowledge and expertise of how operations and operation decisions are made.

Can you go to Slide 7, please.

So there's a lot of information on this slide. And I'll ask, Mr. Hunt, if you can zoom in on the upper left-hand chart, please.

So with this chart is -- this is for the -- this is model input and output for the USBR, DWR Biological Assessment no action alternative. So this is the no action alternative used for the modeling in this proceeding.

On the X axis are the export estimates for the SWP that are input to the model. And there's two export estimates input to the model for non-wet San Joaquin and wet San Joaquin. The Y axis is the model output for the June through August SWP export at Banks. So those purple tick marks are the actual model output.

And in the non wet San Joaquin years, the actual modeled exports vary by about a million acre-feet. And those are represented by a single export estimate for making allocations.

And then the wet San Joaquin varies by around 300,000 acre-feet. So the 1,010,000 for the non-wet San Joaquin and 1,218,000 acre-foot export estimate, we don't know where those came from. It's not documented. But I do want to point out it's really important that the model makes allocations based on the export estimate, not what is exported in CalSim.

So I'd like to shift over to the right a little bit and this is the same plot but for the preferred alternative. Note that the export estimate

is the same as the no action alternative. However, the exports vary by 1.2 million acre-feet in the non-wet San Joaquin and about 800,000 acre-feet in the wet San Joaquin type.

When you average blue -- or the purple tick marks, the average annual exports for the June through August period increase by 70,000 feet in the action alternative compared to the no action alternative, yet the export estimate remains the same. It's reasonable to assume that, if you're going to export more water, that you would allocate that water south of the Delta. And by leaving those export estimates the same, that water's moved but not allocated.

So this results in more water being exported out of the system and not allocating. And this has a ripple effect through the entire system operations. And because of this, it underestimates the effects of the California WaterFix.

So the bottom two plots are similar for the CVP. We have the same issue with the CVP as we do with the SWP.

Mr. Hunt, if you could go to Slide 9, please.

So next we'd like to address the manual export estimate adjustments made in the SWP allocations and the MBK Alternative 4A.

WITNESS EASTON: Please go to Slide 10.

Using Exhibit DWR-86, Figure 6, DWR criticizes MBK for bypassing export estimates in several years of the MBK Alternative 4A because petitioners thought it was inconsistent with the MBK no action alternative.

We disagree with the petitioners' argument that the manual input of 9999 is an inconsistent implementation of discretionary decisions between alternatives. It is realistic to expect that the added export capability provided by the California WaterFix at times will cause SWP Table A allocations to go from being export capacity constrained to supply constrained.

Put simply, if there is greater export capacity with the California WaterFix, it is reasonable to expect the SWP to use that additional capacity. The MBK export estimates provide the foundation for the export capacity constrained allocation in MBK no action alternative and MBK Alternative 4A.

MBK's entries of 9999 in given years was simply a recognition that in those years deliveries were clearly supply constrained and therefore that the modeling should use the supply-based allocation methodology, which is the WSI DI.

In such years, export capacity does not limit

allocations to contractors. It is upstream reservoir carryover consideration that limit the allocations. The appropriate allocation methodology in supply constrained years is WSI DI which takes Oroville carryover guidelines into account.

Furthermore, the MBK no action alternative results show that, in 26 of the 35 years for which 9999 was entered for the export estimate in MBK Alternative 4A, the Table A allocations in MBK no action alternative were also supply constrained. And allocations were based on WSI DI, just as they were in MBK Alternative 4A. In only 9 of the 35 years that 9999 was entered was the MBK no action alternative Table A allocation export capacity constrained and the MBK Alternative 4A Table A allocation was WSI DI constrained.

The difference in allocation methodology in these years was not due to the inconsistent implementation of discretionary decisions between alternatives as petitioners argue. Instead, it was due to the additional export capacity that would be provided by the California WaterFix and the discretion that operators would have to use it.

WITNESS BOUREZ: I'd like to add that we're changing model parameters to follow simple operation

rules. This technique has been used countless times for evaluations with CalSim and its predecessors.

Go to Slide 11, please.

We'd like to talk about model consistency with SWP Oroville carryover policy. And this criticism is that we are operating CalSim in a more aggressive manner, and this is inconsistent with SWP carryover policy.

If we can go to Slide 12, please.

So, again, I've got to explain our charts. So I'd like to talk about this top chart. And the policy that we're talking about is one that Mr. Leahigh presented in DWR Exhibit 902. It's also the code that is in CalSim. So those are consistent. MBK is using the same logic.

So what I'd like to explain is this chart, the Table A allocation based on DWR policy is on the X axis. So this is calculated based on that equation that Mr. Leahigh presented where it relates Oroville carryover and allocations.

The Y axis is the Table A allocations produced by CalSim. So if the CalSim allocation equals the policy, those years or allocations would fall on that red line. Okay? So all those blue points on that chart are when the allocation equals the policy. And

those are the years where the model follows the WSI DI process.

The green points are when the allocations from the model are less than the DWR policy. These are the years where the export estimate controls the allocation in CalSim.

So we have export constraints. You can't move all the water that you have to follow the policy. It's a physical impossibility to follow the policy, or the export estimate is set too low to follow the policy.

So the top chart is for the no action alternative. The bottom chart is for the preferred alternative model by petitioners. And you can see that the green dots tend to go up a bit. And that is because of surplus diverted, we have higher allocations.

So if you could go to Slide 13, please.

These are the same two plots for the MBK modeling. Notice that the MBK modeling has no dots above the red line. We are following the policy describe by Mr. Leahigh and coded into CalSim. We are not violating the DWR policy. We're applying this rule the same as the petitioners do.

I'd also like to point out in the bottom chart that we are following the policy in the alternative as

well, and those green points that are export constrained are still below the policy. We could be more aggressive in our modeling, allocate more water and still follow that DWR policy described by Mr. Leahigh.

You can go to Slide 14, please.

Next we're going to address the MBK operational rules for manual CVP allocations.

WITNESS EASTON: And if you would go to Slide 15, please.

Reclamation criticizes MBK for hand adjustments to North of Delta and South of Delta service allocations in both the MBK no action alternative and the MBK Alternative 4A.

A summary of their criticisms is as follows: MBK studies were extreme. MBK studies were hand crafted to produce a particular result. MBK studies had no logic at all.

We disagree with all of these criticisms. First, in our case in chief, we explained our operations strategy to allocate storage when available. We defined the availability of stored water to be when combined carryover in Folsom and Shasta exceeds 3 million acre-feet. This is a conservative estimate given that Shasta's RPA level is 2.2 million acre-feet.

We explained how Joint Point of Diversion can be used to convey this additional stored water. And finally, in our case in chief, we explained why it was necessary to adjust CVP North of Delta and South of Delta service contractor allocations for the correct implementation of CVP policy to equalize allocations throughout the CVP service area. The WSI DI method simply doesn't get this right, and petitioners have never directly addressed the explanations we provided in our case in chief.

The fact is MBK used consistent CVP allocation logic in both the MBK no action alternative and MBK Alternative 4A. The impacts of the California WaterFix that MBK has shown is simply a result of that consistent application of allocation rules.

WITNESS BOUREZ: So as Mr. Easton pointed out, we changed the modeling parameters to follow well defined rules that we described in our case in chief. The operations of CalSlim are okay for recon and planning level studies, and we use those quite often in these studies. Mr. Easton and I have ran numerous studies using these rules, and they do a good job for planning level studies.

However, it's our opinion that this is not a planning level study. This is an impact analysis. And

CalSim can be used to model the California WaterFix in much more detail. We are modeling operations, and it's important to model those operations as accurately as possible.

And I do want to point out that CalSim is a good model. We're not trying to bash CalSim. It's the way that it's being applied, and there's different levels of applying the model. It could be a reconnaissance level, planning level, impact analysis level. And what's needed for this project is a detailed level of operations, and we're modeling operations.

If you could go to Slide 16, please.

Next we'd like to address reliance on Joint Point. MBK's been criticized for incorrect assumptions regarding Joint Point, that Reclamation can't rely on Joint Point when making allocations because of the uncertainty of the availability.

If you can go to Slide 17 please.

So this plot shows the historical use of Joint Point of Diversion. This is CVP pumping at Banks Pumping Plant. So this is federal pumping at Banks. The blue component of those bars are the June through September federal pumping at Jones pumping plant. The red bars at top are the October through May export, CVP

export, at Jones.

During D1485, Joint Point was used more often. It has been used less over the years, but it is still an important component of CVP operations.

If can you please go to Slide 18.

This plot contains similar data that we saw on the previous plot, the X axis is end of September San Luis storage, the CVP San Luis storage. And the Y axis is the same data you just saw, federal pumping at Banks from June to September.

The points that are circled in green in the upper left-hand portion of that plot, these are times when the Joint Point of Diversion for the June through September period are greater than the carryover storage in San Luis. It's reasonable to assume that the CVP relied on Joint Point of Diversion for the current year allocation in those years.

Other times, the CVP has exported water using Joint Point, in excess of what's carryover. So this would be exports that are in support of following year's allocation. And when this is done, the projects balance how much water is in upstream storage. So if Folsom is very high, for example, and has a high probability of spilling, it's more efficient to convey that water as much as you can and put it where it would

be used or it's likely to be spilled. So there's efficiencies in operations for moving Joint Point at that time of year.

Please go to Slide 19.

So this plot is from MBK model output for our Alternative 4A.

The X axis is Shasta carryover storage. So that would be end-of-September storage in Shasta and the Y axis is the federal Banks export. So this is the use of JPOD in our modeling.

It's important to note that, to increase CVP allocations South of Delta or use the tunnels, the primary use for the CVP is to convey stored water when we have high storage upstream. And that falls into the DWR -- or the Reclamation policy of allocating and using those supplies in excess of the standards.

So if we have high storage upstream as Mr. Easton described, higher than 3 million acre-feet and we're higher than the RPA in Shasta, it's reasonable to assume that we would use Joint Point to convey that water.

It's important to note that MBK does not violate the Biological Opinions in Shasta. We do not convey water when Shasta carryover falls below the Biological Opinions. So we are meeting all the

requirements in the system and conveying water.

I'd just like to point out an example. The -- at 3 million acre-feet of Shasta carryover storage, we're conveying almost 400,000 -- more than 400,000 acre-feet using Joint Point of Diversion, and Shasta is sill at 3 million acre-feet in storage. That's Shasta alone. And there's water in Folsom as well. It's reasonable to assume that that water would be conveyed.

I'd like to go to slide 20, please.

This is actual operations data for the year 2013. The red line on this plot is Shasta storage for this year. And Shasta was about 2.9 million acre-feet at the beginning of July, and it was brought down to 1.9 million acre-feet at the end of September, so about a million acre-feet feet of draw-down.

Folsom was about 660,000 acre-feet at the beginning of July and was brought down to 360,000 at the of September. Also note that San Luis' low point was 93,000 acre-feet about mid August and ended end of September at 224-.

The shaded green area is Jones export. So that's CVP pumping at Jones. And during the July through September period, 655,000 of pumping occurred at Jones pumping plant. In addition to that, 35,000 acre-feet of CVP water was conveyed using Joint Point

of Diversion.

So Shasta was pulled down to 1.9 million acre-feet to support exports. We were not temperature controlled upstream. We checked the temperature compliance, and we were within compliance. So this water was released from Shasta and Folsom for the purpose of supporting exports. Drawing Shasta down to 1.9 million acre-feet is more aggressive than the MBK modeling with the WaterFix. We did not use Joint Point and increase diversions and pull storage down when we were down to 1 million 9. We used 3 million acre-feet combined Shasta Folsom, which is more conservative than what has been done in recent historical operations.

Please turn to Slide 21.

I'd like to touch on San Luis rule curve and upstream reservoir operations. And I know this has been a very confusing topic for this whole proceeding. And, you know, there's questions whether San Luis rule curve should be changed or shouldn't be changed, what the opinions are.

I'd I like to go to Slide 22.

I don't want to confuse that. We were criticized because we didn't change the rule curve. The response is this is a discretionary action. There is no permit terms or conditions or anything in the

project descriptions that really describe how the rule curve would be changed or that operators will operate one way or another.

So changing the rule curve does change upstream operations, and the petitioners changed that. It pulled storage down in June, more than the no action. We testified about that in our direct testimony.

I'd like to turn to Page 23, please.

And here, Mr. Easton will address the use of generalized model logic to analyze the effects of the California WaterFix.

WITNESS EASTON: Please turn to Slide 24, please.

During rebuttal redirect, petitioners stated that, if MBK had used generalized model logic similar to that used by the petitioners in their modeling, the MBK -- that MBK would not have been able to achieve the same impacts as shown in the MBK modeling. The implication is that it was our modeling methodology that caused the impacts and not our disagreements concerning operators discretionary use of the California WaterFix.

Petitioners statement is unfounded. The reality is that, if MBK had used the generalized logic

that petitioners recommend, the effects of the California WaterFix would have been greater than those presented in the MBK testimony. MBK performed a simple sensitivity study for this surrebuttal testimony to demonstrate this point.

To understand our sensitivity study, you need to understand MBK's points of contention with the petitioner's modeling.

One, petitioners rebalanced upstream storage in San Luis using the rule curve, even though there are not proposed regulations that actually make this reservoir reoperation part of the project.

Two, petitioners did not increase export estimates in the allocation logic to represent the increased export capacity provided by the California WaterFix thereby artificially expressing allocations. So for our sensitivity, we used the petitioners' preferred alternative and all the generalized logic contained in it and made two adjustments. And this is where we get to the slide.

The first adjustment we made was that we set SWP San Luis rule curve to the no action alternative. The second adjustment we made, we're making modest increases to the SWP export estimates to recognize the California WaterFix.

So if you turn your attention to the table in the slide, in the first column is the month -- June, July, or August. The second two columns are the export estimates for June, July, and August as found in the DWR USBR BA modeling and their no action alternative. They use the same export and estimates in both. And in the last two columns, those are -- in this sensitivity, those are what we adjusted the exports to be.

In June, we changed the export estimate from their model at 2,500 cfs to 3,000 cfs for the non-wet San Joaquin years. This is based on a comparison between their preferred alternative and their no action alternative and finding that, for non-wet San Joaquin years, that exports on average increased by a thousand cfs.

We did the same type of analysis for wet San Joaquin years and found that exports on average increased by 500 cfs. So we increased the June exports for wet San Joaquin years from 6,000, 6,500.

And then in July and August, the export estimates in the DWR USBR BA modeling and in their no action alternative -- where that 7,000 comes from is it's a combination of the Banks permitting capacity 6,680 cfs plus a few hundred cfs for moving lower Yuba River Court transfer water.

With the California WaterFix, permitting capacity is no longer going to be a constraint. In fact, in both months, Banks physical capacity is 10,300 cfs, and there are no regulations that would prevent them from using that full capacity. It will be a choice of the operators whether they want to release sufficient water to use that or not.

But for our export estimate, we use something -- a very modest increase, in my opinion, going from 7,000 cfs to 8,000 cfs in the July and August period.

And so given that explanation, let's go to the next slide and look at the results.

MS. NIKKEL: Mr. Easton, what slide number are you on?

WITNESS EASTON: I am on Slide 25. Is that -- yes.

CO-HEARING OFFICER DODUC: We'll go ahead and give you additional time to finish up.

WITNESS EASTON: Okay. First, I want to address the top figure on this slide. This is the Oroville carryover storage exceedance probability for DWR USBR no action alternative, the DWR USBR H3-plus, which is their preferred alternative, and MBK's sensitivity study which is the DWR USBR H3-plus with

modest modifications to the SWP export estimate and setting SWP rule curve logic to be the same as the NAA.

So the one labeled MBK H3-plus, that is the sensitivity we just ran. And the one labeled DWR USBR H3-plus, that is the petitioners' preferred alternative. And it's important to note that the study we used was the one that the petitioners provided in their rebuttal testimony that did not include climate change. So all three studies do not have -- there's no climate change in all three studies.

Note that the USBR DWR H3-plus, the petitioners' preferred alternative shows a positive impact to Oroville carryover of 700,000 acre-feet on arrange. And with just the modest modifications the MBK made to petitioners' preferred alternative, that impact goes from positive to negative with a reported impact of negative 146,000 acre-feet.

Now let's address the bottom figure in this slide.

Here we have had -- here we have added the MBK Alternative 4A to the above plot for sake of comparison. Remember, this is the MBK model where we've been accused of overstating impacts because of our modeling methodology. Note that the average impact to Oroville carryover storage of MBK Alternative 4A is

negative 74,000 acre-feet. This is half of what the impact of our reasonable sensitivity -- sorry -- or reasonable sensitivity using the CalSim generalized logic shows.

So I'll repeat, the petitioners' implication that it was MBK's modeling methodology that caused these impacts is not supported by the facts. It is MBK's disagreement regarding discretionary use of the California WaterFix that is the cause of the difference in impacts between petitioners' modeling and MBK's modeling.

And please go to Slide 26. And I'm just going to make one last point about the sensitivity study. Even with the significant reduction in Oroville carryover, the allocation procedure is still using the DWR Oroville carryover policy testified to by John Leahigh encoded in Al CalSim. This figure, just like the others that we presented earlier in the testimony, is evidence that the export-based allocations do not exceed the DWR policy-based allocations implemented through WSI DI.

WITNESS BOUREZ: Please turn to Slide 27.

We'd like to address a criticism regarding Term 91, where Mr. Leahigh stated he does not expect the frequency of Term 91 curtailments to change with

the construction of California WaterFix.

We disagree with this conclusion that construction and operation of the California WaterFix has the potential to increase the frequency of Term 91 curtailments, so that -- the California WaterFix has potential to take more water out of the system and divert more natural flow. This can cause the Delta to go from an excess condition to a balanced condition. This may happen a week, two weeks, three weeks earlier than it does now. And that has the potential to increase the frequency in which Term 91 curtailments are imposed.

Please turn to Slide 28.

So in conclusion, MBK modeling applied consistent operation rules and logic to the no action alternative and the California WaterFix scenarios. MBK's modeling of discretionary actions adherers to the SWP policy and CVP philosophy.

There are no physical legal or regulatory conditions that would prevent the petitioners from operating the California WaterFix as we have modeled it. Therefore, MBK's modeling results are a valid depiction of potential California WaterFix operations.

Thank you.

MS. NIKKEL: That concludes our direct

testimony.

CO-HEARING OFFICER DODUC: Thank you, Ms. Nikkel.

Before we break for lunch, could I get an estimate for those who anticipate conducting cross-examination? Identify yourself and provide me with a time estimate, please.

MR. MIZELL: Tripp Mizell, Department of Water Resources. We anticipate something around 45 minutes.

CO-HEARING OFFICER DODUC: Is that it?

MR. MILIBAND: Wesley Miliband, City of Sacramento.

Just a follow on yesterday's conversation about scheduling. Just curious if the hearing team would like to have Bonny Starr present this afternoon given those estimates.

CO-HEARING OFFICER DODUC: That's what I'm trying to anticipate right now. Given that we will only have 45 minutes of cross-examination at least so far for this panel, yes, I expect we will get to Ms. Starr.

MR. MILIBAND: Thank you.

CO-HEARING OFFICER DODUC: All right. With that, we will take our lunch break, and we're going to take a little bit longer break than usual because it's

Friday. We will resume at 1:30.

(Whereupon, the luncheon recess was taken at 12:04 p.m.)

AFTERNOON SESSION

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(Whereupon, all parties having been duly noted for the record, the proceedings resumed at 1:30 p.m.)

CO-HEARING OFFICER DODUC: It is 1:30. Welcome back. I see that everyone has taken their appropriate position. Thank you very much.

Mr. Berliner, Mr. Mizell, and Ms. Aufdemberge please begin by outlining for me the topics you will be exploring in your cross-examination.

MR. BERLINER: Yes, thank you. I will be -- this is Tom Berliner on behalf of the Department of Water Resources. I'm being accompanied today by Mr. Mizell and by Ms. Aufdemberge.

There are five areas of cross-examination that we'll be looking at. First is CVP operational philosophy -- well, CVP operational philosophy, Joint Point of Diversion, perfect foresight, and export estimates, sensitivity analysis, and the concluding section of the -- the conclusion, if you will, of the MBK report where the statement is made regarding the modeling versus criticisms of MBK modeling.

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

CROSS-EXAMINATION BY MR. BERLINER

MR. BERLINER: Okay. Thank you. I would actually like to start with the -- the last topic. If we could please have SVWU-302 Page 31. And if we could scroll down -- I think you're not quite there yet. Go to the conclusion, and then scroll down. Keep going to Page 31. There we go. And scroll down a little further. Keep going. Right there.

Thank you.

I'm not sure who best to direct these questions to, so I will just direct them both to Mr. Easton and Mr. Bourez, and whichever one of you is appropriate to respond, I'm assuming you'll respond to whatever the questions are that I have.

At the very conclusion of your testimony, you indicate that the criticisms of the petitioners of MBK's modeling obfuscates the key issue, which is whether there are any physical, legal, or regulatory conditions that prevent the petitioners from operating the California WaterFix as modeled by MBK.

To the best of your knowledge, is it the goal of your clients to see legal or regulatory constraints imposed on upstream reservoirs for the benefit of your clients' consumptive uses.

CO-HEARING OFFICER DODUC: Ms. Nikkel?

MS. NIKKEL: Objection, calls for a legal conclusion.

MR. BERLINER: No, that is not the context in which I asked the question. I asked to the best of his knowledge what the goal was. I did not ask about the nature of any legal or regulatory constraints.

CO-HEARING OFFICER DODUC: Mr. Berliner, do you mean the goal of the modeling that they conducted?

MR. BERLINER: Well, the goal of the modeling is part of the bigger picture. So my question to them is about the goal of their clients and why they did this, and that is as to whether they are seeking to make the case for or lay the ground work for a case for the legal or -- imposition of legal or regulatory conditions on upstream storage for their clients' consumptive use.

CO-HEARING OFFICER DODUC: Ms. Nikkel?

MS. NIKKEL: I'm going to object on two grounds, that it's -- I still think it calls for a legal conclusion. It also is outside the scope of the rebuttal testimony. And also I think it's vague and ambiguous. I'm not sure what you mean by "goal" and what you mean by the follow-up to that about the legal constraints on upstream operations, if that's what you said.

CO-HEARING OFFICER DODUC: I agree on all those grounds. The objection is sustained.

Mr. Berliner, I would encourage you to rephrase if you plan on pursuing this.

MR. BERLINER: I will attempt to rephrase.

What was the purpose of the conclusion of the last statement in your testimony here that there are no legal -- no physical, legal, or regulatory conditions that prevent petitioners from operating the CWF as modified by MBK -- modeled by MBK?

WITNESS BOUREZ: This is a complicated question to answer. There was a lot of criticism focused on MBK's modeling and with way we modeled it. There are no physical, legal, or regulatory conditions that prevent the WaterFix from being operated the way we modeled it. That's what we mean.

MR. BERLINER: Okay. So are you seeking to have -- to the best of your knowledge, are you seeking to have any legal or regulatory condition imposed on the petitioners from operating the California WaterFix consistent with the way that you've modeled it?

CO-HEARING OFFICER DODUC: Ms. Nikkel?

MS. NIKKEL: Same objection. Specifically, I really this think this calls for a legal conclusion because it's calling for the legal position of the

protestants upon who are -- who are relying upon the testimony being offered and the legal position that those protestants would be arguing to the Hearing Officers. So I think it calls for a legal conclusion.

CO-HEARING OFFICER DODUC: Mr. Berliner, I'm still tending to agree.

MR. BERLINER: Well, I'm really not asking a legal question. I'm asking what the objective is of raising a concern about the way the project might be operated because clearly it is stated in several places, including here, that the project can be operated in a number of ways. And the Sacramento Valley Water Users are arguing that the project could be operated as MBK has set forth.

CO-HEARING OFFICER DODUC: Mm-hmm.

MR. BERLINER: My question is are they seeking to have conditions imposed on the reservoirs that would keep reservoir storage higher than what it otherwise might be to prevent the project from being operated as the way MBK suggested it might be. They are suggesting how the project might be operated. So I want to know is their goal to avoid that mode of operation? And maybe that's the question.

CO-HEARING OFFICER DODUC: Ms. Nikkel?

MS. NIKKEL: I think it's still calling for a

legal conclusion. I also think it's outside the scope of this testimony, which is addressing the issue of whether the proposed project would or could injure legal users of water. Whether or not those legal users of water are proposing terms and conditions is also an issue in this hearing, but it's not what the this testimony is about.

CO-HEARING OFFICER DODUC: Mr. Bezerra.

MR. BEZERRA: One further ground for objection, it's vague and ambiguous. There's, I think, 35 members of the Sac Valley Water Users group, all of whom are different districts with different interests. So what any given one of them wants is vague and ambiguous.

CO-HEARING OFFICER DODUC: No, he's not going to go through all 35.

MR. BERLINER: Actually, I'm not because they're presenting their testimony as a unified group. So to the extent they've chosen --

CO-HEARING OFFICER DODUC: Nevertheless, nevertheless, Mr. Berliner, I am sustaining the objection.

MR. BERLINER: Okay. I will try this a different way, see if I can get beyond an objection.

Were you watching the proceedings when

Kevin O'Brien conducted cross-examination of the American River group?

MS. NIKKEL: Objection outside of scope of this testimony.

CO-HEARING OFFICER DODUC: I want to see where he goes with this, Ms. Nikkel. You can always raise it again, but let's give him an opportunity to see if we can move this along.

WITNESS BOUREZ: I did not watch the American River group testimony or cross-examination.

MR. BERLINER: Same answer for you, Mr. Easton?

WITNESS EASTON: Same answer for me.

MR. BERLINER: You have contended that there are -- and I'm going to skip physical for now because I'm really focused on legal or regulatory.

And I better ask a question. By physical conditions, you are not referring to a regulatory requirement that would affect the storage or movement of water, correct? You are talking about physical capacity of the system to hold water or move water, correct?

WITNESS BOUREZ: I just want to make sure I understand your question, sir, before I answer it.

You're referring to there are no physical,

legal, or regulatory conditions. And in that statement, the physical limitations we're referring to are capacity, the capability of moving water. So there's -- and that's a complex question in and of itself, whether there's physical capacity or regulatory capacity to move that water through the system -- as well as the regulatory requirements for system carryover storage and cold water pool management.

Within those physical limitations, is what we're referring to.

MR. BERLINER: So when you're referring to physical, then, are you referring to conditions that are in the biological opinions?

WITNESS BOUREZ: That would be the regulatory. I think I mixed my answers up there.

MR. BERLINER: Thank you.

WITNESS BOUREZ: So there's a physical amount of water that needs to be in the system in, say, Shasta in order to comply with the regulatory requirements so, in a sense, that physical limitation of how much water is in storage to meet those requirements, you know. So there's kind of a gray area between what's physically available in terms of water.

There's physically water in the reservoir. You can bring it down to -- you know, Shasta down to

550, but that would violate the regulatory requirements, but that water is physically there. So you have to consider both the physical and regulatory requirements.

MR. BERLINER: Okay. Then let me ask the question again, are you seeking to have imposed a physical condition that would prevent the petitioners from operating the California WaterFix as modeled by MBK?

MS. NIKKEL: Again, objection, outside the scope of the testimony. As I said before, whether any of the members of the Sacramento Valley Water Users are proposing terms and conditions is a different issue.

The purpose of this testimony is to support the argument that the protestants have that the project would result in injury.

CO-HEARING OFFICER DODUC: Same ruling, Mr. Berliner.

MR. BERLINER: Okay. Thank you. I will move on.

CO-HEARING OFFICER DODUC: That was a "sustained" by the way.

MR. BERLINER: Yes, I understood. Thank you.

I'd like to talk about CVP operational philosophy. If we could flip to Pages 16 -- 16 of this

same exhibit. And starting at the bottom of the page and going over to 17, there's a quote from Mr. Milligan that I'm sure you're familiar with. Could you take a look at that, just refresh your memory.

Are you ready, sir?

WITNESS BOUREZ: Yes, sir.

MR. BERLINER: Great. So Mr. Milligan indicates -- to paraphrase -- that the CVP has been and continues to be operated to make full use of excess water to sup- -- during wet periods and the use of stored water to supplement releases and deliveries when adequate water is not otherwise available. The ability to control storage releases, as Mr. Milligan indicates, heightens the value of stored water and increases the priority for building and maintaining adequate upstream storage reserves.

What do you understand to mean in that statement by "increasing the priority of building and maintaining adequate upstream storage reserves"?

WITNESS BOUREZ: It's a little ambiguous, and there's -- the philosophy is a little vague. But in terms of building upstream storage reserves when you have a wet event and higher flows than is required in the system, you're going to store as much water as you can.

In the drier times you're going to maximize the beneficial uses of that stored water for -- to meet regulatory requirements and to provide water supply to CVP water users to the extent that you can under those regulations.

MR. BERLINER: And you state that the CVP operations in the MBK modeling are consistent with this operational philosophy, correct?

WITNESS BOUREZ: Yes.

MR. BERLINER: And we all understand, correct, that releases and deliveries are different things? In other words, the release of water is not the same as the delivery of water.

WITNESS BOUREZ: Well, there's a lot of different releases and a lot of different deliveries. So I just want to be clear what you're asking. Are you saying a reservoir release versus a diversion from, say, a stream or a diversion from the Delta?

MR. BERLINER: Right.

WITNESS BOUREZ: They are different.

MR. BERLINER: Yes. Could prioritization of building storage reverse include decisions to not move water from Shasta to San Luis during the July to September period?

MS. NIKKEL: Objection, calls for speculation.

And if it's not speculating about what Mr. Milligan meant here, then it's vague and ambiguous as to what you mean by "prioritization."

CO-HEARING OFFICER DODUC: Mr. Berliner, you can help me understand that question as well.

MR. BERLINER: Sure. So MBK has indicated in their testimony at the beginning of that paragraph that the CVP operation assumptions that they used in their modeling is consistent with the operational philosophy expressed by Mr. Milligan. Part of that operational philosophy involved building storage.

Mr. Bourez has just testified that he understands what that philosophy concerns regarding building storage and -- during wet years and the use of that stored water during dry years.

So my question is not a speculative question. My question is could prioritization of building storage reserves include a decision to not move water from Shasta to San Luis during the July to September time period?

CO-HEARING OFFICER DODUC: Overruled.

WITNESS BOUREZ: So this is again a complex question. The decision on how much water to move from, say, Shasta to anywhere in the system, any delivery, versus upstream or in the export area, I would

characterize it as a decision how much to move and what not to move. So it's a balance of the resource in the system.

So there's times where it makes sense to -- for operational efficiency to convey more water. And there's times where storage could be lower and you would want to preserve more water upstream to protect upstream conditions. And so there's a balance.

You know, I can't say it's a decision to not move water or to move water. It's -- you're always releasing water during that period. You don't gain storage during that dry period of the year. So the question is how much do you release and for what purpose, and how do you manage the entire system? That's really what's done.

So there is a balance between carryover and how much is allocated to the water users. And that balance is part of the philosophy, I believe, that Mr. Milligan was describing. If you have a lot of water upstream, it's highly likely that you're going to move more. If you have very little water upstream, you're going to move less. And it's that balance.

And it's our understanding that the philosophy of the CVP is to provide water to the water users to the extent that you can while protecting environmental

conditions and the regulatory requirements.

And that's the way we performed our modeling.

MR. BERLINER: And in the range of those decisions, could part of that decision be to not move water into San Luis during the July to September time period?

WITNESS EASTON: I mean, the operators -- I mean, we have great -- I mean, we think they do a good job operating the system. And if it makes sense to move the water, they're going to move the water. If it doesn't make sense to move the water, they're going to keep it upstream. I mean, it's as simple as that.

WITNESS BOUREZ: And also keep in mind that they're always releasing stored water during the summertime. The outflow is very rarely greater than inflow during this period. So the purpose of releasing water is to meet minimum in-stream flow requirements at Keswick, Wilkins Slough, Delta flow requirements.

Sometimes the releases at -- you know, to meet in-stream flow requirements is greater than what's needed to meet Delta outflow. So sometimes that water does get exported just incidentally because you have to release the water from Shasta. So sometimes you're releasing it for temperature control in the Upper Sacramento River. So sometimes you really have little

choice in those years when the reservoir is lower.

When the reservoir is higher, you could make a choice to keep Shasta very high and spill the water out. I mean, you could say, "We're just not going to release the water for exports." Even though, if you have the capacity, you could keep Shasta full.

MR. BERLINER: So how does your more aggressive allocation philosophy facilitate the building and maintenance of upstream storage reserves?

WITNESS BOUREZ: Can you say -- more aggressive than what?

MR. BERLINER: More aggressive than the way that petitioners have modeled -- than the petitioners' modeling?

WITNESS BOUREZ: So to answer that question, I'd like to pull up our PowerPoint, which is SVWU-303, Page 19.

So to be more aggressive on the CVP side, we look at the times that Shasta and Folsom were high in storage -- the combined was over 3 million acre-feet -- and the times that Shasta was above the RPA level of 2.2 million acre-feet.

Our more aggressive, if you call it that, operation was to use that water that is in excess of those requirements to do our best to meet CVP

contractor allocations. This part of Ron Milligan's philosophy is, if you have that excess water, be it in storage or natural flow in the system, is to use it. And that's -- that's what we did.

We did not use it more aggressively than is required to meet the RPAs. And we used it less aggressively than recent historical operations. So when you say "more aggressive," we believe that the petitioner's modeling without use of Joint Point of Diversion, even though there was ample capacity to move that water, doesn't follow Mr. Milligan's philosophy of delivering that excess water.

And it's just reasonable to assume that, if you have 3,000 cfs more export capacity at Banks during the summer months and the State's not using it and you've got a lot of storage upstream that's likely to be spilled, it's reasonable to assume that it would be moved. That would be consistent with Reclamation's policy of satisfying their water users and complying with regulatory requirements.

MR. BERLINER: Do you understand that part of the operational philosophy expressed by Mr. Milligan is to prioritize upstream storage?

WITNESS BOUREZ: I understand that. And I would like to explain -- if you go to the next slide,

please, Mr. Long.

This is the 2013 operation where CVP released about a million acre-feet from July 1st through end of September bringing Shasta down to 1 million 9. This is part of the philosophy that Mr. Milligan stated. And in our modeling, we do not operate as aggressively with the WaterFix as was done in 2013. If we were carrying over water for drought protection, which was done in 2013, the 1 million 9 is protection against the drought. And that's why the 1 million 9 is there.

So we are operating according to the philosophy and less aggressive than what was done. And keep in mind that we did have a drought in 2014 and 2015. So this was the protection we had going into that critical period.

MR. BERLINER: And you're only referring to 2013 as an example, correct?

WITNESS BOUREZ: We could pull out many examples if you'd like to, but currently we're referring to this example. If we want to go to 2008, Shasta was pulled down the 1 million 4. You know, we can go through all the history if you'd like to, and we can explain the balance between releases and exports.

Again, we are being conservative in following the rules we established in this modeling. We don't

want to overestimate what the impacts of the project would be.

MR. BERLINER: And have you quantified how much of this release was for in-stream purposes?

WITNESS BOUREZ: So as I stated, we didn't break it out exactly what was in-stream purposes, but we do know that we were within compliance. On the temperature in the Sacramento River, we were -- the temperature was below the target in the summer. And those releases were made to support exports.

And the same is true for the Nimbus release. We were in compliance at Watt Avenue in terms of temperature, and the releases were above what was required for temperature requirements. It's clear that these releases were made to support exports.

MR. BERLINER: Are you aware of any other in-stream flow requirements that might have compelled the release of water besides temperature?

WITNESS BOUREZ: There's a number. So for Sacramento River, it's Keswick minimum flow requirement. There's a minimum flow requirement at the low flow point on the Sac River, just upstream from the confluence of the Feather; it's Wilkins Slough. And --

MR. BERLINER: Let me interrupt you because I may have misled you. I'm talking specifically about

the release that you've identified here in 2013, not the general requirements.

WITNESS BOUREZ: Okay. We did look at the in-stream flow requirements, and these releases are above those in-stream flow requirements. I can't remember exactly what the flow was at Wilkins Slough, but it was above what was required. I could look it up in a couple of minutes if you're interested.

MR. BERLINER: Well, let's move on, and let's see how we do because I don't want to take too much time.

Could the ability of the California WaterFix to capture excess water in the spring for exports reduce the dependency on stored water in the fall for exports?

MS. NIKKEL: Objection, I think it's an -- calls for speculation and incomplete hypothetical. I'm not sure we know under what circumstances such a scenario would play out.

CO-HEARING OFFICER DODUC: Mr. Berliner?

MR. BERLINER: Well, as a modeler, I suspect that this is well within the familiarity that these gentlemen have with the project's capability to capture water, both in the spring and in the fall. And they've examined at length the potential use of the California

WaterFix. So I'm pretty sure this is well within their competence to respond to.

CO-HEARING OFFICER DODUC: And please repeat your question.

MR. BERLINER: Sure. Could the ability to capture excess water in the spring for export reduce the dependency on stored water in the fall for export?

CO-HEARING OFFICER DODUC: Overruled.

WITNESS BOUREZ: Okay. So as Ms. Nikkel stated, there are a large number of conditions. This -- it would offset it depending on how much surplus is captured and what the supply condition is for water users throughout the system.

So if -- for example, if you take the year 2014, we had a period of surplus. If that surplus was diverted because we have the tunnels, we significant shortfall south of the Delta.

In years where you have significant flow in the system and high storage upstream, and you're meeting all the demands South of the Delta because of the WaterFix, then it may not cause additional releases upstream.

So in general, the more surplus you pull out of the system, the less reliance on stored water. But there's a lot of circumstances involved in that. It

depends on the conditions throughout the whole system -- how much demand is being satisfied, how much unmet demand there is, what all the storage conditions are, the carryover storage condition. So it's not a simple, "We're going to divert more water; therefore, we're not going to rely on storage." It's a little more complicated than that.

MR. RUIZ: I understand. And so I didn't ask you if it would -- if capturing spring flow would reduce the need in the fall; I asked if it could reduce the need in the fall to release storage.

WITNESS BOUREZ: Under certain circumstances, it could.

MR. BERLINER: Thank you. I'd like to move on to Joint Point of Diversion.

If we can go to Page 21, please, of Sacramento Valley 302. If you could go to the top page, please.

So you see the first full paragraph on that page about three lines down after the comma? It states, "The petitioners could use JPOD," meaning Joint Point of Diversion, "in a manner similar to historical operations in the late 1980s or at an even higher amount." Do you see that language?

WITNESS BOUREZ: I'm reading it now.

Yes, I see it.

MR. BERLINER: Are you familiar with the temperature requirements in Water Board Decision 90-5?

WITNESS BOUREZ: I have read them and studied them, but it has been a few years since I've he gone through it.

MR. BERLINER: Are you aware that the -- that as a result of Decision 90-5, temperature needs in the Sacramento River relied on storage in Shasta?

WITNESS BOUREZ: Yes.

MR. BERLINER: And could that -- could those temperature requirements result in lower use of Joint Point starting in the early '90s?

WITNESS BOUREZ: Are you referring to what happened historically, or are you referring to what would be done in models?

MR. BERLINER: I am referring to what happened historically and which has been captured in the model and then, going back to your reference, that Joint Point could have been operated as it was in the '80s, which predates 90-5.

So perhaps I should restate it a little bit and say in light of Decision 90-5, is it reasonable to expect that Joint Point could be operated in the same manner as it was prior to those temperature requirements being imposed?

WITNESS BOUREZ: That's a good question. And to answer that, I'd like to go back to SVWU-303, and also Page 19, please.

So in all of the conditions where we used Joint Point of Diversions in our modeling, we were complying with 90-5 and we were complying with the RPA. And these were established, you know -- and let's just go back through history because in the '80s it was before 90-5. And then in 1992, NMFS issued a biological opinion for the protection of winter run. And that's where we have a different temperature compliance. And that's where the 1.9 million acre-foot carryover was required. And those have been introduced -- updated since then.

So what we did in the Joint Point of Diversion with this modeling is we made sure we were in compliance with the Shasta RPA. And we believe that Joint Point could be used in those years to convey more stored water. And as we have testified in several of our exhibits, the issues that we have is that if you move that water in those years, even though you're above the RPA level, it could result in going into a dry condition with lower storage. And that's where we're concerned that we may have impacts upstream.

So yes, you could certainly move more water

and use joint point within a given year and be well within compliance of 90-5 and the Salmon biological opinion.

MR. BERLINER: Your modeling did not include climate change, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: To the best of your knowledge -- and I understand you're not a climate expert, but you have studied the petitioners modeling which does include climate change -- based on your knowledge and familiarity with the models by petitioners, will the impact of climate change make it more difficult to comply with those temperature requirements?

MS. NIKKEL: Objection, vague and ambiguous. Are you asking about Mr. Bourez's generalized understanding of climate change and the effects of it, or the way in which climate change and its effects was portrayed by petitioners' modeling?

MR. BERLINER: The latter.

MR. BEZERRA: I would also like to object to that it misstates the evidence. Again, yesterday, petitioners refused to say whether or not their modeling was adjusted in the water supply allocations to account for climate change.

CO-HEARING OFFICER DODUC: Mr. Berliner, with

the clarification that you just provided to Ms. Nikkel, I will overrule the objection.

MR. BERLINER: Thank you.

WITNESS BOUREZ: Mr. Berliner, could I trouble you to repeat the question?

MR. BERLINER: Based on your familiarity with the petitioner's models -- tell you what. Let's take a look at Figure 9 in Exhibit 302.

MS. NIKKEL: Mr. Berliner, could you give us a page number?

MR. BERLINER: You know what? I don't have the page number. I just know the figure number. Sorry.

Okay. So Figure 9 is historical federal exports at Banks pumping plant using Joint Point diversion, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: And as I recall your testimony that you recited before lunch, you observed that use of Joint Point has declined from the '80s into the '90s and into the current times, correct?

WITNESS BOUREZ: That's correct.

MR. RUIZ: And that seems pretty evident by the change in the height of the different bars on this graph, correct?

WITNESS BOUREZ: On this graph, right.

MR. BERLINER: And just for clarity, these are not modeled diversions using Joint Point, correct? These are actual numbers?

WITNESS BOUREZ: These are historical actual numbers.

MR. BERLINER: So you see an abrupt change going into the '90s, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: To what do you attribute that abrupt change?

WITNESS BOUREZ: So there's a little bit of history here.

So we had the adoption of the Water Quality Control Plan in 1995, where we started to operate to D1641. So there was a change in the requirements in the system. And those requirements are different than 1485. Where 1485, there was a 3,000 cfs limit on both pumping plants for May and June and the CVP was allowed to pump pay-back wheeling of 192,000 acre-feet I think it is. I always get that number confused, whether it's 196- or 192-. But -- so CVP got pay-back wheeling of that amount.

And you can see that this plot, if you were to draw a line across the 200,000 acre-foot line for the

pay-back wheeling, we're still exporting in excess of that.

So there's a whole -- I could talk to you for hours about just the changes that occurred that would affect this. But D1485 and -- probably had the largest effect on this.

MR. BERLINER: You mean D1641?

WITNESS BOUREZ: Yes, the change from D1485 to 1641.

MR. BERLINER: Do you recall the year of D1641?

WITNESS BOUREZ: 1994 is when the Water Quality Control Plan was adopted, and '95 was when it first started to be operated.

MR. BERLINER: And you'll recall that there was still a drought in 1990 and 1991, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: So part of the decrease in use of Joint Point during those two years could be attributable to the drought, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: 1992 was a -- a far better water year, correct?

WITNESS BOUREZ: No, 1992 was the Shasta critical year.

MR. BERLINER: Oh. That was the last year of the drought. Sorry. 1993 was a better year, correct?

WITNESS BOUREZ: 1993 was a better year. And then 1994 was critical, Shasta critical. '95, '96, '97 were wet; '98 was wet.

MR. BERLINER: And yet even in those wet years, you see a substantial reduction in the use of Joint Point as compared to during the '80s, correct?

WITNESS BOUREZ: That's correct. And there's probably a variety of reasons for that.

MR. BERLINER: So the best of your knowledge, California WaterFix is going to have to comply with current regulatory requirements, correct?

MS. NIKKEL: Objection --

MR. BERLINER: D16- --

MS. NIKKEL: -- calls for a legal conclusion and is speculation and is probably outside the scope of the testimony.

CO-HEARING OFFICER DODUC: Was that like a foundational question for another line of questioning, Mr. Berliner?

MR. BERLINER: Yeah. Well, Mr. Bourez just got done discussing a variety of regulatory requirements differentiating D1485 from D1641; we've talked about biological opinions.

My question is pretty simple and foundational, is that, based upon what we know today, that those requirements will continue into the future. They may be changed under WaterFix. We would expect new biological opinions, perhaps a new Board order amending 1641. But you would expect them to be regulated --

CO-HEARING OFFICER DODUC: I will take your question at face value for now and overrule the objection, and we'll see where you go with this.

WITNESS BOUREZ: I would assume that, with the WaterFix, that the current regulations, if they aren't changed, would have to be in place and that the projects would operate to those.

MR. BERLINER: So what would you identify, then, in the WaterFix that would allow for the increased use of Joint Point?

WITNESS BOUREZ: That's a great question. I was hoping you would ask.

So during the summertime, you could have approximately 3,000 cfs of additional capacity to move water from June through September. And that additional capacity, it's doubtful that we could transfer all the water that's in Oroville and use full capacity of Banks pumping plant during that time. And there is increased opportunity to use Joint Point much more than we ever

saw historically because, even under D1485, we were still operating to 6680 and 4600 exports for Banks and Jones respectively south of the Delta.

So when you look at the additional capacity that's available, it's reasonable to assume that, if the CVP has high storage upstream, that it would be moved or conveyed through Joint Points.

Also keep in mind that, under the petitioners' modeling, they are showing that Oroville is about 90,000 acre-feet higher on an average annual basis. So they're proposing that they would use Banks pumping plant less than they do without the project. So not only would they be using their existing pumping plant less, they would be adding 3,000 cfs capacity to it.

And you look at those conditions, and I would assume that there would be significant opportunity for the CVP to convey stored water using Joint Point.

MR. BERLINER: Joint Point is junior to the State Water Project's use of Banks, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: So you just mentioned that there would be additional storage in Oroville?

WITNESS BOUREZ: The way the petitioners' modeling -- you compare their Alternative 4 in their Biological Assessment to the no action alternative, the

average carryover storage in Oroville is 89,000 acre-feet higher. They're moving less stored water with their preferred alternative.

MR. BERLINER: And as I understand the MBK modeling, you're moving more water than the way it's been modeled by the petitioners?

WITNESS BOUREZ: We are -- our average reduction in Oroville carryover in our preferred alternative, our California WaterFix modeling compared to the no action is 74,000 acre-feet higher average annual in Oroville -- I mean lower, excuse me, in Oroville.

MR. BERLINER: And that water would be moved to Banks, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: Making Joint Point less available, correct?

WITNESS BOUREZ: I disagree with that because the addition 3,000 cfs export capacity June through September would make it more available. So part of that, if you look at the increased exports that we have, that's roughly, 1200 cfs for one month that that 74,000 acre-feet would take up on average. And there's ample opportunity to use unused available Banks capacity to convey CVP stored water.

MR. BERLINER: And the availability of that capacity is dependant upon whether or not the State is using Banks, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: And as far as the CVP would know in a given year as to the intentions of the State Water Project in, let's say, February, March, or April to use Banks during the summer, they wouldn't necessarily know that during that time period, correct?

WITNESS BOUREZ: I disagree with that. And I would like to explain how they're doing that currently.

And to explain that, I'd like to pull up SVWU-303, Page 7 -- Page 8.

So this is the plot we showed. And I want to point to the kind of golden bars and the brown bars. Those brown bars are water transfer pumping. So this is non-project pumping. And MBK's involved in a large number of water transfers. And in order for that transfer water to be conveyed from North of Delta to South of Delta, a decision has to be made to idle crops no later than May 1st.

So these decisions whether to plant or not plant have to be done in time for farmers to make that decision. In order to make that decision, they have to have an assessment of what the available Banks capacity

is to convey that transfer water.

So the projects have been forecasting available Banks capacity for transfers. And these are multi-million-dollar transfers. If they transfer the water and the capacity's not there, they could loose an awful lot of money. So there's a lot of risk involved.

So the projects have been estimating what the capacity, available capacity at Banks is for quite some time. And we assume that, with additional capacity, that it will be more certain how much water could be conveyed through those -- through the tunnels. If you have 3,000 cfs more capacity or capability of moving water, it's reasonable to assume, based on how we're forecasting that available Banks pumping in the past, that they would be doing that in the future, and there would be more of it.

MR. BERLINER: Well, I'm going to actually get to this chart again, so rather than asking you questions about it now, let me finish this line, and we will get to that.

So given this -- this sort of known availability, as you contend, you didn't include use of Joint Point in the MBK no action alternative, correct?

WITNESS BOUREZ: That's incorrect. It is in there. And it's used with the same logic as we put

into the with-project alternative.

MR. BERLINER: Did you use it as a common operation? In other words, is it -- well, I'll just leave it at that.

WITNESS EASTON: Well --

MR. FERGUSON: I'm going to object as vague and ambiguous.

CO-HEARING OFFICER DODUC: I'm sorry? Object to what? He didn't ask a question.

MR. FERGUSON: He did. He asked if it was used as a common operation.

MR. BERLINER: I asked that question.

CO-HEARING OFFICER DODUC: I'm sorry?

MR. BERLINER: I did ask that question.

CO-HEARING OFFICER DODUC: And the answer was? There was no answer?

MS. NIKKEL: There was an objection it's vague and ambiguous.

CO-HEARING OFFICER DODUC: All right. So Mr. Berliner, it was so vague and ambiguous that I didn't catch it.

MR. BERLINER: So I'm taking it the objection is sustained.

CO-HEARING OFFICER DODUC: Yes. I didn't even think it was a question it was so vague and ambiguous.

MR. BERLINER: I'll try to be more clear.

Did you use the availability of Joint Point in the no action alternative at the same level as you do in the WaterFix alternative?

WITNESS BOUREZ: We applied the same rules in no action alternative as we did in the WaterFix alternative. However, with the WaterFix alternative, there is much more capacity to use Joint Point, so it was used more.

MR. BERLINER: So did you then apply it at a higher level in the WaterFix alternative, in other words, more use of Joint Point?

WITNESS BOUREZ: I'm not quite sure I understand the -- your question.

MR. BERLINER: You've indicated that the use of Joint Point -- the availability of Joint Point is predictable and that you've included it in your no action alternative with a certain amount of availability for Joint Point, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: Did you show more availability of the use of Joint Point in the WaterFix alternative than you did in the no action alternative?

WITNESS BOUREZ: Yes, there's more capacity to move more stored water, so, yes. And if you'd like, I

have -- in SVWU-107, we have some plots to show some details on the differences in Joint Point, if you'd like to visit that in more detail.

MR. BERLINER: My time has run, so I don't want to exhaust doing that. I do have a bit more on the question of perfect foresight and on the sensitivity analysis for the use of generalized model logic.

I'm afraid I used a lot more time at the beginning than I thought I would.

CO-HEARING OFFICER DODUC: I don't believe we set the clock at 16 minutes. I think we set it at 45. So another 20 minutes, Mr. Berliner?

MR. BERLINER: 20 to 30 I would say.

CO-HEARING OFFICER DODUC: Let's go ahead and give him the time to finish up.

MR. BERLINER: Are we okay with the court reporter? Yes? Thank you.

CO-HEARING OFFICER DODUC: And we'll take a break within that 20 to 30 minutes.

MR. BERLINER: Okay. Thank you.

All right. Let's move on to perfect foresight and export and estimates.

Regarding setting allocations, in other words, the amount of water that's going to be provided to

water users, is the setting of an allocation in a given year a management decision?

MS. NIKKEL: Objection, vague and ambiguous. Are we talking about in the model, or are we talking about in real life?

MR. BERLINER: In real life. It doesn't change in the model as to the nature of the decision.

MS. NIKKEL: Thank you.

WITNESS BOUREZ: Yes.

MR. BERLINER: And the allocation decision is based on a number of factors, correct?

WITNESS BOUREZ: Yes, it is.

MR. BERLINER: Inflow to the reservoirs is an input to that decision process, correct?

WITNESS BOUREZ: Yes.

MR. BERLINER: And you can use both actual inflow or forecasted inflow in a model, correct?

WITNESS BOUREZ: Yes.

MR. BERLINER: And you can use either actual inflow or modeled -- or forecasted inflow in a model, correct?

WITNESS BOUREZ: Yes.

MR. BERLINER: And do I understand correctly that the use of actual inflow is what you're characterizing as perfect foresight?

WITNESS BOUREZ: It's one aspect of it, yes.

MR. BERLINER: You identified a number of San Joaquin tributary irrigation districts whose allocations are calculated in CalSim.

WITNESS BOUREZ: Yes.

MR. BERLINER: And do you characterize that as perfect foresight?

WITNESS BOUREZ: There is perfect foresight used in those allocations and operations.

MR. BERLINER: And those allocations are a computed management decision in CalSim, correct?

WITNESS BOUREZ: Yes, they are.

MR. BERLINER: Are system-wide project allocations also a management decision?

WITNESS BOUREZ: Which ones? Because some of them, I think a large number, are contractual. And they're non-discretionary, which would be the settlement contracts.

MR. BERLINER: Yeah, that's a good observation.

There are a number of obligations that are, let's call it, mandatory, correct, subject to contract, subject to regulation?

WITNESS BOUREZ: Yes.

MR. BERLINER: Above those requirements, are

the allocations that are above that the water service contractors? Are those management decisions by the SWP and CVP?

MR. BEZERRA: Objection, vague and ambiguous. I don't know if we're talking about real world management decisions or modeled allocation logic we seem to be flipping back and forth between the two.

CO-HEARING OFFICER DODUC: Mr. Berliner?

MR. BERLINER: Well, the models try to capture what happens in the real world. So if we're trying to make -- to have an understanding of the nature of a decision that has to be made, it doesn't really change from the real world to the modeled world.

I mean, the whole point of doing the modeling is to arrive at a decision. So when we're doing models and looking at what happened historically -- pick any past year you want that's been modeled -- there's certain decisions in there, some of which we just talked about, that are subject to mandatory requirements subject to regulation or contractual obligations, and others have more discretion involved in them.

So my question is the -- concerns the way in which the allocation is made to the water service contractors. Is that a management decision or is that

a requirement?

CO-HEARING OFFICER DODUC: And you're asserting that the answer would be the same whether it is part of a modeling operation or an actual operation?

MR. BERLINER: That's correct.

CO-HEARING OFFICER DODUC: Do you agree, Mr. Bourez?

WITNESS BOUREZ: In actual operations, it's a management decision; in the modeling world, it's a modeler's decision.

CO-HEARING OFFICER DODUC: You're growing on me, Mr. Bourez.

MR. BERLINER: And the -- the quote "decision by the modeler" is based on past operational decisions, correct? In other words, when the modeler looks at previous years, all of those allocations that were made were based on -- allocations to the water service contractors were based on a management decision, correct?

MR. BEZERRA: I'm going to object. It misstates evidence; it's vague and ambiguous. We had a long discussion yesterday about how the WSI DI works, and Mr. Reyes specifically testified about how the WSI DI curve is set to be conservative so that the model in its logic doesn't over-allocate water.

CO-HEARING OFFICER DODUC: Mr. Berliner?

MR. BERLINER: I'm not -- that's a valid observation, but I don't think it changes my question. It's still the same question. I guess this is sort of a stipulation for Mr. Bezerra that, based on Eric Reyes' testimony from yesterday, he characterized it as a management decision. So that's fine. I'll move on. If the witnesses are confirming that, that would be fine.

CO-HEARING OFFICER DODUC: I don't believe that is -- that's happening.

MS. NIKKEL: I don't understand the terms of the stipulation, frankly. So if you want to restate it, or if Mr. Bezerra wants to respond.

MR. BEZERRA: It's not a stipulation. It was an objection --

CO-HEARING OFFICER DODUC: It was.

MR. BEZERRA: -- as to the difference between management decisions and model logic.

CO-HEARING OFFICER DODUC: Modeling decisions, yes, sustained.

MR. BERLINER: Okay. Try this again.

In the modeling that you did, the decisions for system-wide allocations are based on manual inputs, correct?

WITNESS BOUREZ: Not entirely.

MR. BERLINER: Are they all calculations?

WITNESS BOUREZ: Can you be a little bit more -- it's a model. Everything's a calculation. So I'm -- it would be helpful if you were a little more specific.

MR. BERLINER: All right. In the system-wide allocations in your model, you made certain changes to the allocations, correct?

WITNESS BOUREZ: Okay. So let's be specific because the CVP and SWP were dealt with differently because of the nature of the two projects.

Mr. Easton is probably better suited to answer the details of each. And --

MR. BERLINER: That's fine.

WITNESS EASTON: So --

WITNESS BOUREZ: Can you be specific on which project you're referring to, whether it's --

MR. BERLINER: Let's start with the CVP.

WITNESS EASTON: Can you repeat the question? Please repeat the question?

MR. BERLINER: Sure. Let's just direct this at Mr. Easton regarding the CVP.

In the modeling of the CVP regarding system-wide allocations, you made a number of manual

inputs, correct?

WITNESS EASTON: We did.

MR. BERLINER: So those were not inputs that the model calculated. Those were inputs that you made to determine the allocation, correct?

WITNESS EASTON: Yes.

MR. BERLINER: Now returning to the State Water Project, what's the difference?

WITNESS EASTON: So the Central Valley project has a policy that separates North of Delta service contractors and South of Delta service contractors that, when export capacity does not limit South of Delta allocation, that the service contractors in both areas will receive equal allocations.

MS. NIKKEL: I'm going to interject an objection here because I think the question was vague and ambiguous. And I'm not sure that the witness understood the question and may be answering a different question.

So could you restate the question, Mr. Berliner? What was the difference between CVP and SWP allocations or how those allocations were made in the model?

CO-HEARING OFFICER DODUC: I took it to be the

latter.

MS. NIKKEL: I did too.

MR. BERLINER: I did as well.

CO-HEARING OFFICER DODUC: Okay. Mr. Easton?

WITNESS EASTON: So to be clear, you're asking why we treated the two projects differently in the model.

MR. BERLINER: Right.

CO-HEARING OFFICER DODUC: He's asking if you did, and if so what that --

WITNESS EASTON: We made it clear in our testimony -- I mean we made it clear in our case in chief that we treated it differently. And we provided an explanation of why in our case in chief.

And it has to do with the -- basically, the CVP has a difference how they treat South of Delta contractors and North of Delta contractors. And the way that the WSI DI procedure, export estimate procedure, is in the petitioner's version of CalSim does not capture that division well.

And we did not -- it was -- it's a difficult thing to do. And that's why we have -- we haven't solved this in CalSim. It was -- and so we -- you know, we had a few weeks to put together this study. We couldn't -- we didn't have time to come up with an

automated procedure to do this.

But we also understood that it was important to get this right in order to determine what the affects were to Sacramento water users.

WITNESS BOUREZ: So if I may add to that, try to get to your answer -- your question maybe. For the CVP, the North of Delta contractors, the water service contractors, the ag service is about 320,000 acre-feet; that's mostly Tehama-Colusa Canal Authority. They're allocations -- the WSI DI is a system-wide and includes the Delta, San Joaquin supplies. And those -- those allocations in actual operations are based more on upstream conditions than they are Delta and South of Delta conditions.

And when we looked at what -- the WSI DI and how it allocates water -- and this is in our direct testimony; we have several pages on this and lots of graphics -- it didn't capture the allocation to those contractors in a way that we felt was adequate to assess the effects of the WaterFix.

So we have a long history of working with Tehama-Colusa Canal Authority and the Bureau of Reclamation, been in countless meetings with them on allocations and actual operations. And so we applied the knowledge that we have there and what has been done

historically to revise that allocation to the North of Delta CVP contractors. And they are higher in a lot of cases than what is in the petitioner's modeling.

And one of the key differences we could see in the petitioners' modeling -- and this is in the CalSim modeling; it's not just what the petitioners did for this project. We see cases where Shasta could have a 3 million acre-foot carryover storage and the North of Delta CVP's got a 50 percent allocation. And based on our experience, the Tehama-Colusa Canal Authority would get a hundred percent allocation when you have that high of a storage.

So what we did is we revised that allocation North of Delta. Then when you apply or look at what the WaterFix would do, it increases the ability of Reclamation to balance out North of Delta allocations and South of Delta allocations so that they could be equal more often. And that's an effect that we saw of the WaterFix. And that does change the flow regime in the system.

So what we tried to capture in our CVP allocation logic was what's been done in recent operations and how the Bureau is making those decisions. So we did not use the WSI DI to set those allocations; where in the SWP, we did use WSI DI to set

allocations for the State contractors. And now there's -- the next step is the export estimate. What we varied on the SWP side was the export estimate alone. That's what we did.

So the SWP we used WSI DI, and we varied the export estimate to account for the export constraints with and without the tunnels because really, when you add capacity to the system, conveyance capacity, the thing that really changes is the export estimate, your ability to convey water. So that's really what we changed.

Now, with the SW- -- CVP, there is a difference. So we had a hard time with the current model logic to allocate water North and South of Delta, so we made manual adjustments to those allocations. And we used consistent logic between the no action alternative and the with-project alternative.

I know it's a long-winded answer, and I hope I answered your question appropriately.

WITNESS EASTON: I'm just going to make one clarification of Mr. Bourez' explanation. For SWP allocations, that applies to our Alternative 4A and it applies to our no action alternative.

MR. BERLINER: All right. So regarding the manual allocations that you made, on Page 16 of your

testimony -- and maybe we can pull that up, go back to that.

If I understand correctly, what you said was you ran the model through September of a given year. And then you indicate that you used some technology built in by DWR. What I take it you mean by that is the model allows you to stop in September to take a look at what's happening, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: Okay. So you ran the model through September, and then you paused, and you reviewed the results in terms of where you were on allocations, correct?

WITNESS EASTON: Well, I mean, there's a lot of things we reviewed. I mean, there -- that -- that particular -- okay. You want me to answer?

MR. BERLINER: Sure.

WITNESS EASTON: That particular year -- and remember, we did this chronologically, so we started 1922, ran the model through the end of September with some initial allocations in there that we determined.

And then we looked at what the result was, what the carryover storage was, was it whether there was available export capacity -- and we say carryover both in San Luis and upstream. We made a determination

as to whether there was a reasonable allocation using the consistent rules that we outlined in our -- in our case in chief and which we have expanded on in our surrebuttal.

And the -- and so once we look at what the allocation is, we look at what the available export capacity is, we make a determination. Could we deliver more south of Delta? Would the operators be able to do that and make a decision on what the reasonable allocation would be for that type -- and we did that for both the no action alternative and the preferred alternative. And we used the same rules of operation in that.

MR. BERLINER: So I tried to capture this in a drawing. And I will tell you I did this drawing. And I did it using PDF Expert, for which I have the Chair to thank for pointing that out to me as a useful tool.

And if we could pull up DWR Exhibit 953, please. You're not allowed to laugh at my drawing. You can snicker, but no belly laughs.

CO-HEARING OFFICER DODUC: Oh, good. Ms. Meserve is still here. She is the expert when it comes to drawings.

MR. BERLINER: Okay. So what I -- maybe we can blow that up.

What I did here was I drew a simple timeline of January through December, and I went from essentially September -- out to September, and the blue arrow points back to February. And so what this is meant to show is that you -- I tried to capture what you said in your -- in your testimony on Page 16, which is that you ran the model --

WITNESS BOUREZ: What's that? Sorry.

MR. BERLINER: Sorry.

WITNESS EASTON: We were trying to understand your figure.

MR. BERLINER: I was going to try to explain it. So what I tried to do was say, okay, tried to capture what you did and you explained on Page 16, which is that you started at the beginning of the year; you ran the model till September; you paused it; and then you took whatever information you had, and you went back, and you did it again.

I didn't draw multiple go-back arrows, but I drew one just to show that you stopped in September and went back to earlier in the year in order to make your allocations; is that correct?

WITNESS BOUREZ: We didn't go back that far because the final allocation is actually made in May.

MR. BERLINER: Okay.

WITNESS BOUREZ: So when -- and there's a lot to this because in May you have a pretty darn good idea of how much water you're going to export in actual operations, as we testified -- that by the time you are in May, you are making your final allocations for the year. And so what we did is we put ourselves in the position of looking forward in May and trying to make a decision.

And that decision -- in the model, you know, we could have wrote a forecast model to try to forecast, but it was easier to run the model to get through September and say, "Geez, you know, we didn't use any export capacity. And Shasta is very, very high. We should use more water."

So we did make adjustments and rerun that really May through September. But, you know, the model starts in October and runs. But really the decisions we were making is May through September.

WITNESS EASTON: And I would just like to add to that. The -- in terms of the actual point of starting it, as we all know, the CVP contract here is March through February. And so that the beginning would be March. I was basing the allocation on the knowledge that we had that they would have in May, like, or that they -- that essentially the -- that, you

know, assuming that that was their final allocation.

So the allocations did affect the March and April, but the one that counts is May 1st.

WITNESS BOUREZ: I like the drawing, by the way.

MR. BERLINER: Thank you. Appreciate that.

CO-HEARING OFFICER DODUC: I would have liked it more if you'd used blue and gold.

MR. BERLINER: Oh, I didn't even think of that. Well, at least I didn't use red and white.

CO-HEARING OFFICER DODUC: That's right.

MR. BERLINER: For the time series on the State Water Project export estimates, your model started in January, correct?

WITNESS EASTON: Yes. The export estimates do start in January. You're talking about for the State Water Project?

MR. BERLINER: Correct.

WITNESS EASTON: Yeah. So the export estimates are, in my model, is an estimate of whatever month that value is through the end of August; we have a bulk value in that time series, yes.

MR. BERLINER: So when you are starting in January for the State or March for the CVP, the operators don't have knowledge at that point about what

the water year is going to be, correct? They have some knowledge but not a lot?

WITNESS EASTON: We were just talking about SWP. Are we talking about the CVP now?

MR. BERLINER: Well, I identified both projects, State Water Project for January. But I'll do one at a time.

So is it -- the State Water Project, when it starts in January, those operators don't have much information yet about the -- what kind of water year it's going to be, correct, in terms of making their allocation?

WITNESS BOUREZ: Well, it varies. I mean, if you're in a drought and you have very little water supply, by the time you get to January, February, you're going to have a low allocation.

If we have a very wet condition as we had this year, they have enough information to know how much is in San Luis, and, you know, that, hey, our reservoirs are going to be full, then they would tend to make a higher allocation, yet always conservative because they use the 90 percent exceedance forecast.

So by the time you get to May, when the final allocations are made, we have a really good idea. And as Mr. Leahigh testified, that's when they make their

final allocation. And as you can see from the plot that we have, a historical forecast versus what was actually pumped, they have a pretty good idea by the time you get the May.

So in CalSim, whether it's kind of the version of -- the public version of CalSim that the petitioners are using, May is when the final allocations are made. So in all the models we are updating the allocations up and through May. So really the reason we focused on May is that's really the decision point in CalSim.

MR. BERLINER: So the reason that we use a 90 percent exceedance in February a 75 percent exceedance in March is because of that degree of uncertainty, correct?

WITNESS BOUREZ: The 90 percent exceedance was required in Public Law 102575 in CVPIA that the Bureau -- and think it's also in the Salmon Biological Opinion that the Bureau must use a 90 percent exceedance forecast. So by law, they have to use a 90 percent.

MR. BERLINER: And is it your understanding that that's because there's a high degree of uncertainty at that time of year? Not in a specific year, but in general? As we get later in the year, the degree of certainty of what kind of year it is

increases, correct?

WITNESS BOUREZ: That's correct. So if you looked at a 50 percent exceedance and a 90, they get closer together the farther you go through the year. So by the time you get to May, they are reasonably close together, but there are still differences.

MR. BERLINER: I want to change topics, and this will be my final area of questions.

If we could go to, again, SVWU-302, Page 25.

So this is on the use of generalized model logic. And you are highlighting an exchange involving Ms. Nancy Parker, who's from the Bureau of Reclamation, correct?

WITNESS BOUREZ: That's correct.

MR. BERLINER: And Ms. Parker's testimony pertained to CVP allocations, correct?

WITNESS BOUREZ: Give me a minute. I have to read it to see if she's applying this to both CVP and SWP or just CVP.

WITNESS EASTON: You're talking about Ms. Parker's statement on --

MR. BERLINER: Yes, we're talking about the approach that Reclamation took; the questions are to her in that context.

WITNESS EASTON: I read this as that she was

stating this in a general way. She mentions that anyone in DWR would try to do that using consistent model logic between the two alternatives.

MR. BERLINER: Sorry. Say -- I did not quite catch what you said.

WITNESS EASTON: So the question was, if I understood it right, was that she's only referring to the CVP in this comment?

MR. BERLINER: That's my understanding.

WITNESS EASTON: I don't read it that way. I read it like a statement regarding generalized logic, both the SWP and CVP.

MR. BERLINER: And on what do you base that?

WITNESS BOUREZ: There's nothing specific on whether -- the CVP is not mentioned specifically, nor is the SWP. This is a general statement on model logic.

MR. BERLINER: Well, do you see the commencement of that section where I refer to the -- because it cites my question, and I refer to Reclamation?

WITNESS EASTON: Hold on.

WITNESS BOUREZ: So let's just be clear. And I'm sorry to be to slow on this. And I just took -- to read this out loud, "and if -- I believe that you

characterized in your testimony the MBK modeling as being more aggressive or risky than the approach that Reclamation takes to its modeling."

Now Reclamation, they're modeling the CVP and the SWP. So I'm not sure where it calls out whether we're modeling CVP allocations or SWP. I mean we can, I guess, respond to the question in a general sense if you'd like.

MR. BERLINER: No, I wanted to know what your understanding was here. So I think you just clarified it for me. You understood her question to be answering in a general sense.

WITNESS BOUREZ: That's correct.

MR. BERLINER: Because the reason that I ask is because on Page 26, your sensitivity analysis concerns the State Water Project. And I think I'm now understanding that you were using the State Water Project sensitivity analysis because you were thinking that Ms. Parker's response was on behalf of both the State and Federal projects, and so you took it in that context.

WITNESS BOUREZ: That's correct. And also we ran this fairly quickly. We could have changed both projects, but this is really a demonstration, if we changed just the SWP and used the standard --

quote/unquote "standard" algorithms in the model, that the results we would get are quit different and the impacts are greater.

MR. BERLINER: I don't have any other questions. Thank you very much.

CO-HEARING OFFICER DODUC: Thank you. Thank you both. That was very interesting. All right. With that, we will take our afternoon break. And we will return at 2 -- I'm sorry, 3:10.

(Recess taken)

CO-HEARING OFFICER DODUC: All right. It is 3:10. We are back in session.

Let the record show that we have now been joined by Ms. Nicole Kuenzi from the Office of Chief Counsel.

I believe that was the only cross-examination that any parties requested, unless -- actually, no, Ms. Meserve, you may not ask these witnesses questions about the chart that Mr. Berliner developed.

So with that, Ms. Nikkel or Mr. Ferguson, are there any redirect of your witnesses? And if so, on what particular areas?

MS. NIKKEL: Yes, we have some brief redirect on the topic of JPOD.

CO-HEARING OFFICER DODUC: Okay. Proceed.

REDIRECT EXAMINATION BY MS. NIKKEL

MS. NIKKEL: Mr. Bourez, in response to Mr. Berliner's questions about the use of Joint Point, you made some statements regarding the existing constraints on pumping at Banks.

How would the effects of those constraints change under the proposed project?

WITNESS BOUREZ: Well, the existing constraints are regarding the -- they're -- I'm sorry.

The existing constraints are focused on the South Delta diversions. If you add the North Delta diversion, it increases the capability of moving water from north to south. So you would still have to operate to the South Delta export constraints and regulations, but you could export more water by moving -- by diverting from the North Delta diversion. And that would add, in the summertime, about 3,000 cfs capacity.

MS. NIKKEL: Thank you. Nothing further.

CO-HEARING OFFICER DODUC: Any recross?

(No response)

CO-HEARING OFFICER DODUC: All right. With that, then, thank you, Mr. Bourez; thank you Mr. Easton.

Next as part of Group 7 -- and I'll again ask

that you wait to move your exhibits until the entirety of Group 7 has presented your surrebuttal.

MS. NIKKEL: Yes. And as we did during the rebuttal phase, if it pleases the Hearing Officers, we'll submit written letters, given the number of parties, just to be clear which exhibits are being offered by which parties.

CO-HEARING OFFICER DODUC: Great.

Now we will turn to the City of Sacramento and Ms. Starr. And as that is happening, let me get an estimate from anyone -- any party who plans on conducting cross-examination of Ms. Starr.

Please come up, identify yourself and how much time do you anticipate needing.

MR. MIZELL: Tripp Mizell, Department of Water Resources. We'll estimate at this time, 30 minutes.

CO-HEARING OFFICER DODUC: Okay. How much time do you anticipate needing for the direct or the presentation of her testimony?

MR. MILIBAND: Good afternoon, Hearing Chair Doduc. Wes Miliband for City of Sacramento. I'd say ten minutes.

CO-HEARING OFFICER DODUC: Okay. You know what? Since it is Friday -- actually, let me ask. Is there any planned cross-examination of Mr. -- is it

Mehl?

MR. MILIBAND: I'm sorry. The name again?

CO-HEARING OFFICER DODUC: No, no, no. This is for the Sacramento County Water Agency, the next and last witness for Group 7. And I am probably mangling his name.

MR. FERGUSON: Yes, Steffen Mehl is his name. I'm not conducting cross though. I'm for Sac County Water Agency. He will be our witness.

CO-HEARING OFFICER DODUC: And --

MR. FERGUSON: I think your question was about cross-examination.

CO-HEARING OFFICER DODUC: And you're anticipating needing, what, 15 minutes or so?

MR. FERGUSON: He needs about 15 minutes for his presentation, yes.

CO-HEARING OFFICER DODUC: And cross-examination?

MR. BERLINER: We have about three questions.

CO-HEARING OFFICER DODUC: Okay. I think we will get to him today.

MR. FERGUSON: Yeah, I would appreciate it very much because he came down from Chico, so thanks.

MR. BERLINER: Actually, I don't want to disrupt things, if you wanted to do him first because

our cross is going to be really brief.

CO-HEARING OFFICER DODUC: Do you mind, Mr. Miliband.

MR. MILIBAND: I don't, but honestly, I wouldn't mind the pressure on Mr. Berliner to get through cross-examination officially with Ms. Starr. But, no, we'll step out of order if that pleases the Hearing Officers.

CO-HEARING OFFICER DODUC: All right. Thank you, Ms. Starr and Mr. Miliband for accommodating, actually, a member of your own group.

So with that, we will ask the Sacramento County Water Agency to present your surrebuttal.

All right. Mr. Ferguson.

STEFFEN MEHL,

called as a surrebuttal witness on behalf of Protestant Group 7, having been previously duly sworn, was examined and testified further as hereinafter set forth:

DIRECT EXAMINATION BY MR. FERGUSON

MR. FERGUSON: Aaron Ferguson for Sacramento County Water Agency. I'll have the witness state his name for the record.

WITNESS MEHL: Steffen Mehl.

MR. FERGUSON: You've taken the oath in this

proceeding, correct?

WITNESS MEHL: Yes.

MR. FERGUSON: And Dr. Mehl, you understand that you're presenting your testimony today under oath, correct?

WITNESS MEHL: Yes.

MR. FERGUSON: Is Exhibit SCWA-200 an accurate statement of your surrebuttal testimony in this proceeding?

WITNESS MEHL: Yes, it is.

MR. FERGUSON: Were Exhibits SCWA-201, 202, 203, and 204 and 205 prepared by you or at your direction to support your surrebuttal testimony in this proceeding?

WITNESS MEHL: That's correct.

MR. FERGUSON: Dr. Mehl, would you please summarize your testimony submitted for surrebuttal?

WITNESS MEHL: Sure. So basically what I did was evaluate some of the groundwater modeling work that was done as part of the California WaterFix.

MR. FERGUSON: Great. Could you advance the next slide? Just really quickly, could we have SCWA 2005, please?

WITNESS MEHL: So in particular, I looked at the petitioners' rebuttal for the Alt-1B scenario. And

in Ms. Buchholz' rebuttal, it was stated that the Alt-1B was a good surrogate for the preferred alternative, which is the Alternative 4A. And that was based on the stream flows in the Sacramento River being similar in the Alt-1B scenario as it is in the preferred alternative Alt-4A.

So I looked at the CVHMD model, Alt-1B, and also the no action alternative and examined how well those two models would represent groundwater impacts in the Sacramento Sub-basin.

And in this testimony, I'll highlight some of the numerical issues with the CVHMD model and also provide some qualitative assessment of some of the impacts due to changes in stream leakages on the South American Sub-basin.

Next slide.

So the first thing I want to discuss is this idea of a water budget discrepancy. And what this is it's an internal accounting of inflows and outflows and changes in the storages in the groundwater models. So much like a financial accounting where you're looking at how much money is coming in and going out and what your balance would be in your bank account. It's the same idea in the groundwater model. And each simulated time step, it's doing this internal accounting and

seeing how much, you know, inflows and outflows are balancing each other.

Now, because it's a -- in a real model like this, there is some numerical noise and some numerical slop, let's say. Not unlike your checkbook, it might not balance to zero every time. And generally accepted, that's okay; we realize that. But there's a rule of thumb that, if that discrepancy is off by more than about 1 percent, then the model's simulated results are suspect because they're not balancing.

And what I've got here on this plot is the percent discrepancy for the CVHMD no action alternative and Alt-1B. So that's the -- I guess the sort of blue diamonds are the no action alternative; the red squares are the Alt-1B. And then, as a point of reference, I'm also including the CVHM model, the regional model of the no action alternative.

And what you can see is that there are several simulated periods here where the 1 percent threshold is exceeded sometimes plus or minus 30 percent, so way out of balance. And the CVHM model, the regional model is always within that 1 percent threshold. Okay? So indeed, if you drill a little bit deeper, over 50 percent of the simulated time steps in the CVHMD model exceed that 1 percent in a rule-of-thumb

threshold. Okay? So what that means is that this model is not balancing its checkbook at the end of each month, at least within the general guidelines of what's acceptable. Okay?

Next slide.

So looking at some of these water budget components between these two scenarios, the no action and the Alt-1B, the primary water budget components, at least within Sacramento Sub-basin, are the net inter-regional subregional flow. So that's sort of the flow between the lateral boundaries of the South American Sub-basin and adjacent areas; that's in this light green.

The purple bars are the net stream leakage. that's the exchange of flow between the stream and the aquifer.

And then the greenish bars are the change in aquifer storage. So as the groundwater levels go up and down, the change in aquifer storage goes up and down.

And so what we're seeing here is it's sort of -- it's accumulated over the years of the simulation. The idea here we want to see is that generally, you know, between any of these budget components, we see differences on the order of 10-, 20-, 30,000 acre-feet

in any given year.

Okay. Next slide, please.

What the petitioners put forth was the impacts based on maximum difference and groundwater heads or groundwater levels. And in Ms. Buchholz' testimony, the statement in there about the groundwater declines wouldn't be more than five feet, and then on some additional cross-examination, she said that, you know, based on the model results and that analysis, it was zero to five feet. That was what was given in the testimony, also in the EIR/EIS.

Can we get the next slide?

So I actually looked at those differences between the groundwater levels, between the no action alternative and Alternative 1B. And my analysis is showing that the maximum difference is 13 meters or over 13 meters, which is about 44 feet.

So that's the -- you know, that highlighted dot there around April of '69. And if you look at the inset map, you can kind of follow that down along the Sacramento River.

The red dots are the intakes for the North Delta diversions. The green cell sort of south of the North Delta diversions, highlighted green, that's the location where that maximum difference occurs. So

that's right along the Sacramento River downstream of the North Delta diversions.

Okay. Going back to that figure there, you'll see, there's a horizontal red line that's drawn. It's at about 1.5 meters. That's about five feet. So you'll see where there's several occasions where the head difference between the no action alternative and the Alt-1B exceed 5 feet. It's about 34 times.

So there's another issue here as well is that, you know, the -- Ms. Buchholz' testimony and in the EIR/EIS, that some of these figures are showing, you know, changes on a contour map that are between zero to five feet. Okay?

The model precision is set to one meter for hydraulic heads or groundwater levels. So that means the model can't resolve anything less than one meter, which is about 3.3 feet. So of that zero to 5 feet, 3.3 feet of that is just model noise. So there's some questions about how reliable is that zero to 5 feet to begin with.

Next slide.

So this gets into this idea of the model precision, or in the model it's called closure criteria. So we're seeing these large budget errors and also these large differences in heads between these

two models. It's kind of pointing to that there's some numerical instabilities in the model itself.

So I looked more closely at the closure criteria and the tolerances of the model. There's two primary ones. One is that groundwater head closure criteria that I mentioned earlier. Another one is called a D-leak parameter. It's for the stream flow routing process, so how the stream flows are calculated within the model as well.

As I said earlier, the CVHMD model, the precision for the heads is set at one meter. As a point of reference, the regional model, the CVHM model, is set at point three meters. So there's an oddity here in the sense we've got this more detailed, more refined CVHMD model that is being solved to less precision than this large-scale regional model. It's kind of like measure with a micrometer, mark with a chalk, cut with an axe. Right? So that's an oddity, let's say.

The other one is that D-leak parameter for the stream flows. That is set right now in the model, the CVHMD model, at a value of 100.

If you look at the mod flow documentation, the recommendation is the valuation be about point 001. So it's a hundred thousand times larger than, let's say, a

number that's given as guidance. I'm not saying that's what it needs to be, but that's -- you know, just giving you an idea of how different it is and what -- you know, some of the guidance that's out there.

So all that kind of points to that this model might not have the fidelity needed to really get out the stream leakage questions that I cited earlier in my previous testimony.

Next slide, please.

So kind of the highlighting this a little bit more of that D-leak parameter for the stream leakage. What I've got in that upper figure there is the differences between the Alt-1B scenario with the D-leak at 100, which is where it's set right now. And I reduced that down to 25. So I'm making the model more precise. I'm asking the model to, you know, sharpen your pencil a little bit; get a little more precise on your calculations.

Now, in my view, 25 is not very close to the point 01 that's generally recommended, but I'm still asking the model to get more precise. If the model precision were good enough, it would come back to the same answer, essentially.

Now, what we're seeing here is the differences, again, with those same budget components

-- the inter-regional flow, stream leakage, change in aquifer storage. We're seeing differences on the order of 10-, 20-, 30,000 acre-feet. This is within the same model itself. I'm just asking the model to solve more precisely, and it's coming up with very different answers. And the same thing on the lower graph is for the no action alternative.

So what are we seeing here? We're seeing here that the differences within the model itself is, you know, in terms of noise, is on the same order of the differences between different scenarios. So how can we use this model in a comparative way -- which is what the petitioners were saying that this is okay because we're using these models comparatively.

But what I'm seeing here is that there's enough noise in the model that, how are you separating out what's, you know, real and what's just a modeling artifact? Because your noise is as large as the differences between the two models. So the signal-to-noise ratio is very poor.

Next slide, please.

There was also a question of recharge that Ms. Buchholz states that they don't anticipate the North Delta diversions will impact groundwater recharge. But there's also an acknowledgement that,

within this area, there is an interaction between the streams and the aquifers, and there is some recharge that occurs via the Cosumnes and American and Sacramento Rivers. Okay.

We know that the Sacramento River is in hydraulic connection with the aquifers. So if you change, you know, the -- if you change conditions in the river, that will affect the aquifer. They are in hydraulic communication with each other. Okay?

So there is a potential that these changes will impact groundwater. All right? The question is, you know, how much is that? Well, that's, you know, I guess why we're doing some modeling. Yeah?

So if we want to believe what this model is saying even though I just outlined why I think there's a lot of numerical instabilities and inaccuracies -- so prefacing it with that -- if we want to believe what this model is saying, we can take a look at that.

That's the next slide.

So what I looked at was the differences in stream leakage along the Sacramento River overlying the South American Sub-basin. Okay? And this is the difference between the no action and the Alt-1B using the CVHMD model. And this is a cumulative -- you know, so I'm adding -- adding these up year to year. So if

some years were positive and some years were negative, if you do a cumulative, you know, it should sort of balance out to zero.

What we're seeing here is that there's a net cumulative difference in stream leakage over the course of the 40-some years of the simulation period that, you know, is upward of 400-, 450,000 acre-feet.

Now, again, I'm not saying that's what it is, you know, because of all the problems with the model. I'm just saying if this is what we're believing, if this is what we're hanging our hat on, then that's what this is saying.

So in summary, there's -- the key points I want to make are that the model has a large budget discrepancy; its internal accounting is not consistent; it's not balancing its checkbook month to month by sometimes as large at 30 percent.

The head changes that were cited in the previous testimony by Ms. Buchholz of, you know, maximum declines of five feet, that's not what I found. It's more like 44 feet, and it occurs multiple times.

The model precision is such that, especially when it comes to stream leakages, that the differences within the -- how do I say -- the differences within the model itself is larger than the between-model

differences. So if you're subtracting these two, doing a comparative analysis, how do you know what's real and what's a modeling artifact? All right. So the signal-to-noise ratios is really poor, and that makes it problematic to just say, "We can get -- we can just do this comparatively, and everything cancels out." Well, you can cancel out bias, but you don't necessarily cancel out what's random noise. Okay?

And lastly, if we really do want to believe what this model is saying, I mean, it does show that there could be a potential impact to stream leakage along the South American Sub-basin.

MR. FERGUSON: I just have one additional question. I would like -- Dr. Mehl, could you please elaborate a little bit more about what you mean by stream leakage in the last slide in terms of water flows and the interaction between the stream and the aquifer?

WITNESS MEHL: Right, right. So in this case, the CVHMD model is by and large, along this stretch of the Sacramento River, is by and large simulating the steam as a -- as a gaining stream. That is the aquifer is feeding the stream. And so what we're seeing here is that in this case, that the -- there would be -- because this is how this -- it's calculated as sort of

reversed, this would mean that more water is -- under the California WaterFix, more water is leaving the aquifer and draining into the stream.

So from a financial, you know, going back to the accounting analogy, it's not that you're -- it's not that you're getting paid less; it's that your costs have increased. Your net budget is still going to be affected.

MR. FERGUSON: Thank you.

CO-HEARING OFFICER DODUC: Thank you.

Mr. Berliner, your three questions.

I see Ms. Meserve rushing up.

MS. MESERVE: That's the problem with sitting in the back.

I do have a couple of questions for this witness. I'll take about five minutes.

CO-HEARING OFFICER DODUC: All right.

CROSS-EXAMINATION BY MR. BERLINER

MR. BERLINER: Hello. My name is Tom Berliner. I'm an attorney for the Department of Water Resources. Good afternoon, Dr. Mehl. Thank you for your testimony.

I have a question actually about this slide. This is, as I understand your testimony, represents the cumulative accretions from the Sacramento River over

the past 40 years from 1961 to 2003, correct?

WITNESS MEHL: Yes. That's what's in the CVHMD simulation period, right.

MR. BERLINER: So that's about 10,000 acre-feet per year; is that correct?

WITNESS MEHL: Yeah. I mean, you can see it varies, but on average, yeah, that's what it would come out to.

MR. BERLINER: And what's the entirety of the Sacramento River flow during those 40 years?

WITNESS MEHL: So it would -- now, in this reach of the Sacramento River?

MR. BERLINER: Right.

WITNESS MEHL: I would have to look that up.

MR. BERLINER: Do you expect that 10,000 acre-feet a year is a minute fraction of the flow of the Sacramento River in that reach?

WITNESS MEHL: Okay. So -- so here's another thing. We can look at what the model-simulated values are for the flows in the Sacramento River versus actual. So these are modeled values, right? And those are -- and also the modeled flow values are not going to be the same as what are actual either. So I want to point that out as well. Right?

So when we're looking at these results, like I

said, I look at these as a qualitative, right, not a quantitative, right? So just because of all the inaccuracies within the model, right, I was showing plus or minus 10,000 acre-feet just on -- up to 30,000 acre-feet just on model noise. So when we're talking about 10,000 acre-feet per year, that's, you know, what could that be? That also could be within the model noise.

MR. BERLINER: Thank you. I have no further questions.

CO-HEARING OFFICER DODUC: Ms. Meserve, you should have stayed up front.

CROSS-EXAMINATION BY MS. MESERVE

MS. MESERVE: Good afternoon. I just have a couple of questions about the implications of the opinions here regarding the groundwater basin. So the -- your testimony -- is it Dr. Mehl?

WITNESS MEHL: (Nods head affirmatively)

MS. MESERVE: Okay. It indicates that the modeling by petitioners may be terribly inaccurate. Are you aware of the Sustainable Groundwater Management Act of 2015?

WITNESS MEHL: Yes, I am.

MS. MESERVE: Do you know if the Sacramento County Water Agency is participating in the formation

of a groundwater sustainability agency?

WITNESS MEHL: I'm not aware whether they are or what their process is. I would imagine they are, but I'm not involved in the Sacramento County agencies.

CO-HEARING OFFICER DODUC: Hold on, hold on.

Mr. Berliner.

MR. BERLINER: I move to strike those last two questions as being beyond the scope of surrebuttal.

CO-HEARING OFFICER DODUC: Ms. Meserve?

MS. MESERVE: Dr. Mehl has testified regarding -- it looks like a pretty substantial underestimation of the overall impact on -- he's looking at Zone 40 in particular. And so I'm just following up with him on the implications of that to this area.

CO-HEARING OFFICER DODUC: Tenuous, but there is a connection there. I will allow you a little bit of leeway, Ms. Meserve.

MS. MESERVE: Dr. Mehl, do you think that, given the study that you did, that there could be an effect on the ability of the Sacramento County Water Agency to reach the sustainability which is required by the SGMA?

CO-HEARING OFFICER DODUC: I hear an objection.

MR. BERLINER: Yes, you do. I object this is

totally beyond the surrebuttal, and speculative, and there's no showing that this is within the area of expertise of this witness.

CO-HEARING OFFICER DODUC: Yes, I would agree with that one. Sustained.

MS. MESERVE: Do you think that, given the study that you did, that any conclusion at all can be drawn with respect to the effect of the proposed petition on the groundwater in Zone 40 from the modeling that petitioners have presented?

WITNESS MEHL: So just to clear, I didn't do the modeling, right? I'm just analyzing the model results, right? So this isn't -- this isn't my model, right?

And basically what I'm saying is I think there are enough, you know, numerical anomalies and numerical noise in this model that make it very difficult to use it even in a comparative way, to analyze the stream leakage question and the impacts on stream leakage.

MS. MESERVE: And you were looking at the overall basin. But within that basin, there are individual groundwater wells, correct?

WITNESS MEHL: Yeah.

MS. MESERVE: And given what you saw in terms of the imprecision, the extreme imprecision it appears,

of the information, would you be concerned about those individual groundwater wells' ability to continue to draw groundwater from this area?

CO-HEARING OFFICER DODUC: I hear an objection coming.

MR. BERLINER: This is way beyond this witness's surrebuttal. There's no indication that he looked at individual wells at all.

CO-HEARING OFFICER DODUC: I agree. Sustained.

MS. MESERVE: I have no further questions.

CO-HEARING OFFICER DODUC: Any redirect, Mr. Ferguson?

MR. FERGUSON: No, thank you.

CO-HEARING OFFICER DODUC: All right.

Ms. Starr, please come back up.

BONNY STARR,

called as a surrebuttal witness by the Protestant Group 7, having been previously duly sworn, was examined and testified further as hereinafter set forth:

CO-HEARING OFFICER DODUC: Mr. Miliband.

DIRECT EXAMINATION BY MR. MILIBAND

MR. MILIBAND: Thank you, Hearing Officer Doduc. Wes Miliband for the City of Sacramento. We

have a brief direct examination.

Good afternoon, Ms. Starr. Will you state your first and last name and also spell your last name for the record.

WITNESS STARR: Bonny Starr, and the last name is spelled S-T-A-R-R.

MR. MILIBAND: Ms. Starr, did you previously give your oath in this proceeding during City of Sacramento's case in chief?

WITNESS STARR: Yes, I did.

MR. MILIBAND: You understand you're still under that same oath here today?

WITNESS STARR: Yes, I do.

MR. MILIBAND: Is Exhibit City of Sac 36 a true and correct statement of your written testimony?

WITNESS STARR: It's my surrebuttal testimony, yes.

MR. MILIBAND: Is Exhibit City of Sac 9 still an accurate statement of your professional credentials and experience?

WITNESS STARR: Yes, it is.

MR. MILIBAND: And since it's been some time since you last testified, would you please provide a brief description about your professional background?

WITNESS STARR: Certainly. I have a

bachelor's of science in civil engineering and an master's of science in engineering. I'm a registered professional civil engineer in California. And for 23 years now, I've been working in drinking water quality, treatment, and source water protection.

I've worked in drinking water fields for both surface water and groundwater throughout the State of California.

MR. MILIBAND: Ms. Starr, was Exhibit City of Sac 37 prepared by you or at your direction?

WITNESS STARR: I prepared City Sac 37.

MR. MILIBAND: Can you briefly described what that exhibit is?

WITNESS STARR: Certainly. That is a tabular presentation of the actual water temperature of the City's water treatment plants. It's a daily average of three measurements for the years 2012 to 2015 during periods of operation. And that information was previously shown in a graphical form in my original testimony.

MR. MILIBAND: Ms. Starr, referring back to your written testimony for today, which is Exhibit City of Sac 36, would you please provide the highlights of your written testimony?

WITNESS STARR: Certainly. So City Sac 36

presents my surrebuttal testimony related to the potential quality impacts caused by the California WaterFix project that could injure Sacramento's municipal use primarily due to the increased source water temperatures and associated impacts, such as increased treated water disinfection byproduct formation and increased presence of blue-green algae or cyanobacteria in the source water.

I was asked to review the Department of Water Resources' rebuttal testimony, both written and oral, offered by Dr. Michael Bryan and Mr. Doug Owen regarding the City of Sacramento.

In these testimonies and their supporting exhibits, DWR has performed some evaluation of the potential impacts to drinking water users upstream of the Delta.

Sorry. I'm recovering from laryngitis.

MR. MILIBAND: It's Friday afternoon and nearly 4:00 o'clock.

WITNESS STARR: I disagree with the opinions presented by Dr. Bryan in his rebuttal testimony as well as the testimony provided by Mr. Owen and affirm my prior testimony related to the potential impact to Sacramento caused by the presence of cyanobacteria and disinfection byproduct formation.

One key reason I disagree with the opinions presented by Dr. Bryan is that his evaluation uses the USBR temperature model which only provides mean monthly temperatures and evaluates data at Knights Landing on Sacramento River, which is at River Mile 90. It's 30 miles upstream of the Sacramento Water Treatment Plant and does not include the impacts from either the Feather River or the American River.

Mean monthly temperatures are insufficient. It doesn't provide us peak temperatures or the duration of those peak events to see if they're actually able to contribute to the formation of cyanobacteria growth and DBPs. Another key reason that I disagree with Dr. Bryan is that his evaluation uses average velocities from DSM-2 assuming a constant cross-section and not accounting for localized areas of lower velocity, thereby oversimplifying the potential for growth of algae.

Finally, Dr. Bryan's conclusions are highly constrained by qualified statements and most importantly, his conclusions do not address or account for the actual detects of cyanobacteria and cyanotoxins at Sacramento's water treatment plants.

Mr. Owens' testimony uses a combination of selected Sacramento water quality data and theoretical

models to make a prediction about DBP impacts associated with a one-degree Fahrenheit temperature increase. And he has determined that it would be less than significant impacts and would not result in a compliance issue for Sacramento.

However, in my testimony, I present actual data for Sacramento and show that, under a situation with 1.5 degrees Fahrenheit increase in temperatures, we would have results that were significantly higher in DBPs. Actually, an order of magnitude higher -- 10.5 percent increase in total trihalomethanes and a 30.7 percent increase in haloacetic acids, whereas those predicted by Mr. Owen were projected to be 2.3 percent for total trihalomethanes and 1.3 for haloacetic acids. So the actual data show that the theoretical modeling insufficiently predicts temperature impacts on DBP formation for Sacramento.

So in summary, I do not agree that the impact of increased cyanobacteria presence at Sacramento's water treatment plants can be determined by using monthly mean water temperature and velocity and flow or that the impact of temperature on DBP formation at Sacramento water treatment plants has been correctly assessed using an annual averaged temperature and theoretical models.

I do not agree with Dr. Bryan's conclusion that these identified impacts on flow and temperature will not have the potential to significantly impact Sacramento's water supply. Thank you.

MR. MILIBAND: Ms. Starr, based upon your experience and the review that you conducted, particularly for preparation of this surrebuttal testimony, what is your opinion as to how California WaterFix might impact the City of Sacramento?

WITNESS STARR: Well, it continues to be my opinion that, based on what I've reviewed for the California WaterFix proposed project supporting documents as well as the testimonies from Dr. Bryan and Mr. Owen, that Sacramento's ability to continue to use water for municipal supply could be injured by the proposed project, could result in increased water temperatures, lower flows during that critical period of May through October, which would lead to the potential for increased disinfection byproducts in our treated water or presence of blue-green algae in our source water. And those could lead to significant changes by Sacramento to either their operations or water treatment.

MR. MILIBAND: Thank you, Ms. Starr.

That concludes our direct testimony. Thank

you.

CO-HEARING OFFICER DODUC: Thank you.

Mr. Berliner and/or Mr. Mizell?

CROSS-EXAMINATION BY MR. BERLINER

MR. BERLINER: Good afternoon. My name is Tom Berliner, and I'm here on behalf of the Department of Water Resources. I'm assisted this afternoon by Ms. Becky Sheehan.

Good afternoon, Ms. Starr. I have five areas for cross-examination. The first is modeling and the question of current conditions versus the no action alternative; water temperatures and cyanobacteria; temperatures and impacts on the water treatment plant; DSM-2 flow velocity; and the critique of modeling by Dr. Owen.

CO-HEARING OFFICER DODUC: Please proceed.

MR. BERLINER: Thank you.

Ms. Starr, you've asserted that you think it's better to focus on realtime or existing conditions rather than the no action alternative, correct, for purposes of assessing temperature impacts; is that correct?

WITNESS STARR: In the rebuttal testimony, Dr. Bryan had indicated that I was in error looking at the existing conditions. So I just wanted to point out

the reason as to why I looked at the existing conditions versus the no action alternative.

MR. BERLINER: I and wasn't quite clear from your testimony, but are you saying that because of the climate change condition in the no action alternative, the 2025 climate change condition in the no action alternative?

WITNESS STARR: My basis for that is the -- I like real data. I'm an engineer. I looked at the data. And so we had actual data at our water treatment plants that we used for that. So I compared that to what I could put my brain around. And that was the existing conditions rather than modeling projections.

MR. BERLINER: Are you familiar with modeling?

WITNESS STARR: I've reviewed a lot of the output that was in the documents presented by DWR, but I'm not a modeler.

MR. BERLINER: Do you have an understanding as to why we are using modeling in this proceeding rather than actual conditions?

WITNESS STARR: My assumption is that because you have to project what the conditions might be under the different alternatives to compare them.

MR. ROBBINS: Well, okay. So then it's your understanding that we're looking into the future to

compare what the conditions are for operation of the WaterFix under a no action alternative and under the proposed project? Do you understand that?

WITNESS STARR: I understand that you're using it in a comparative fashion.

MR. BERLINER: And that we are looking into the future, correct, because the project's not built yet?

WITNESS STARR: Right.

MR. BERLINER: And in terms of temperature conditions, one of the requirements is that temperature be taken into account for future conditions. Do you understand that?

WITNESS STARR: Can you repeat that?

MR. BERLINER: Yeah. One of the requirements in terms of assessing this project is that temperature conditions in the future be taken into account, basically related to climate change.

WITNESS STARR: It is only related to climate change? Is that what you're suggesting?

MR. BERLINER: Well, we're looking -- sort of a complex area.

We -- do you understand that one of the conditions that the project is required to analyze is the impacts of climate change?

MR. MILIBAND: I would just like to insert an objection at this point. I was trying to see where this might be going, but it does seem to be beyond the scope of the rebuttal direct testimony. I'm happy to hear if there's some clarification if I have a misunderstanding there by Mr. Berliner.

CO-HEARING OFFICER DODUC: Mr. Berliner?

MR. BERLINER: To me, these are -- these are kind of the witness's qualification questions because I want to make sure we're on the same page as to why the witness has chosen to look at the time period of 2014 to 2017 because the project modeling is required to look at climate change in the future.

So I want to make sure that I get on the same page with the witness's understanding.

CO-HEARING OFFICER DODUC: Overruled.

WITNESS STARR: Yeah, so my understanding is that the modeling was initiated in 2010 and that the short-term was ten years. So that would be 2020. And so when I looked -- taking my data from 2016, I feel that it best fits to be understood in terms of the data from 2016, so my real cyanobacteria data, my real total trihalomethane data -- I wanted to compare it to the real conditions that were occurring rather than something that a modeling was projecting that it would

occur.

I was not assessing the validity of the comparative nature of it. I'm just trying to use real data to put parameters around our impacts.

MR. BERLINER: So you understand this project won't be built for, let's say, at least about another ten years, correct?

WITNESS STARR: From now?

MR. BERLINER: Yes.

WITNESS STARR: Yes. So that would be well beyond the 2020 that the modeling projections for the ELT are, right? Isn't that 2020 to 2025, 10 to 15 years out from 2010?

MR. BERLINER: So I'm going to ask the Chair for a little bit of leeway here because I need to explore with this witness the climate change modeling to which I believe she's referring to, where the models looked at future conditions, to make sure that my questions have bearing on this witness's analysis.

MR. MILIBAND: I would just like to respond to that briefly in that the witness has clearly testified this afternoon that she is not a modeler, and this is simply, as I understand it -- but, please, Ms. Starr, if your understanding is different, that's more important. But my understanding is this is about the

methodological approach that was undertaken in rebuttal testimony by Dr. Bryan and Mr. Owen by looking at modeling in theoretical assumptions and projections versus a very different approach that Ms. Starr has explicitly spoken to in her written testimony.

So to get into the modeling and the variations or the motivations behind it is really beyond not only the expertise, as already testified to by this witness, but also the scope of that surrebuttal testimony that Ms. Starr has offered.

CO-HEARING OFFICER DODUC: Mr. Berliner, I ask that you keep that in mind.

MR. BERLINER: Yes, I'm going to try.

Do you understand that the modeling is taking into account temperature looking from 2010 to 2040?

WITNESS STARR: I do, yes.

MR. BERLINER: Okay. Great.

So on Page 3 of your testimony, you state that --

WITNESS STARR: Which testimony?

MR. BERLINER: Your surrebuttal. That's all we're here for today to discuss.

So on Page 3 of your surrebuttal testimony, you state that you disagree with Dr. Bryan that the proper comparison is between the California WaterFix

scenarios, which include climate change, that -- that's denominated as 2025, but in actuality, it looks at climate 15 years in either direction; and 2025 is merely the midpoint between those. So it runs from 2010 to 2040.

So you contend that looking at the years 2014 to 2017 is a more valid basis for assessing project impacts; is that correct?

WITNESS STARR: My evaluation was focused on water quality impacts, and so I was looking at conditions that occurred in, let's say, 2014 to 2017, current data for me, to see how I could use that water quality because, in my original testimony, remember, there was no evaluation done with regard to muni for Sacramento. So I had to try to find in your evaluations for aquatic life on temperature and for Delta impacts on cyanobacteria, I had to try to find ways to make that, an evaluation be conducted for Sacramento.

And so I used the real data that I had from that period to do that with, and I compared it to existing conditions. I was attempting to explain why I compared it to the existing conditions that were presented in the model.

There are times where I did also reference the

no action alternative when the information was available, like on temperature.

So I'm not here to judge whether or not the no action alternative or existing conditions -- I don't, in my surrebuttal, I don't address that. I don't state whether it was right or wrong to do that. I just say that it was a difference between how I did my initial assessment.

And in this particular surrebuttal, I'm focusing on the information that was finally presented with potential impacts to our intakes rather than trying to extrapolate from some other evaluations that were conducted.

MR. BERLINER: Did you look at the modeling that was submitted as part of the rebuttal testimony?

WITNESS STARR: I did not, no. I'm assuming you mean by DWR?

MR. BERLINER: Correct.

WITNESS STARR: No.

MR. BERLINER: So you're not aware that there was a tremendous amount of data included in the modeling information that was set forth in the rebuttal phase?

WITNESS STARR: No. My surrebuttal focused on addressing the opinions presented by Dr. Bryan and the

evaluation conducted by Mr. Owen. And I did not reassess anything on the modeling. I was very focused on looking at the drinking water impacts for the City of Sacramento and the evaluations that were presented by DWR in those testimonies.

MR. BERLINER: So if I understand it, your analysis, does not take a look at the WaterFix modeling scenarios in order to differentiate effects due to climate change with or without the project?

WITNESS STARR: No. That was not the purpose that I had. My purpose was to look at the evaluation that was conducted by Mr. Bryan -- Dr. Bryan and Mr. Owen and assess if I felt that that was a valid evaluation for our impacts. So, no, I never spent any more time thinking about the modeling. I focused on their work.

MR. BERLINER: Okay. Thank you.

So as I understand your testimony, there are a number of areas where you agreed with Dr. Bryan's testimony when he said that there were multiple factors that can cause algal blooms, correct?

WITNESS STARR: Yes.

MR. BERLINER: And that currently the state of science is such that there's a fair degree of uncertainty regarding causes of algal blooms?

WITNESS STARR: I don't think it's necessarily the cause of them. It's the conditions which -- and remember, you're talking about a bloom. So that may not necessarily be as important as just the presence of cyanobacteria.

But it's the factors that become more or less important in the proliferation of algae in different environments, yeah.

MR. BERLINER: So it's the interaction of these various factors where the uncertainty lies; is that correct?

WITNESS STARR: So there's multiple uncertainties. The uncertainties are related to site-specific conditions that -- whether it's temperature or competition for the presence of them to occur. But then there's also uncertainties associated with the density required for it to be an impact, the species that are required for there to actually be -- the outcome that I'm concerned with is not just the presence of cyanobacteria but the cyanotoxins associated with them.

So there's a lot not of not perfectly well understood science behind that.

MR. BERLINER: So as I understand your response, you're identifying that there are multiple

factors that impact whether or not algal blooms occur and whether cyanobacteria occurs; is that correct?

WITNESS STARR: Yes.

MR. BERLINER: And temperature is but one of those factors?

WITNESS STARR: Yes. It's a key one because it actually has a threshold.

MR. BERLINER: And it's uncertain, is it not, that a change in any single factor would or would not contribute to the -- to a change in microcystis abundance?

WITNESS STARR: I think that you have higher likelihood. As I mentioned, the temperature is a very strong threshold that exists. It's scientifically proven that they don't want to grow in low temperatures. So that's one that's a little more discrete than the other ones. Because it is a relatively sophisticated algae, it has the ability to adjust to its environment more so than other algae so it can out-compete a little bit and probably work through some of those constraints maybe a little bit better.

MR. BERLINER: But you're not suggesting that a change in temperature in and of itself would be the determinant factor, correct?

WITNESS STARR: It could be.

MR. BERLINER: But you're not suggesting that it is, are you?

WITNESS STARR: Well, temperature is -- they don't grow if it's 8 degrees Celsius. If it's -- I mean, we have data that shows that at 18.3 degrees Celsius we have cyanotoxins in our water. So obviously cyanobacteria were growing below 19 degrees Celsius. So temperature is certainly a key factor.

MR. BERLINER: If there's no spores present, would temperature make a difference?

WITNESS STARR: If there's no spores present then obviously it's not able to grow. But we know that not to be true in our Sacramento and American River because cyanotoxins have been detected. Therefore that means the presence of cyanobacteria. And as Dr. Bryan described in his testimony, they reside in the sediment and come back year to year. So they are present in our waters now.

MR. BERLINER: Does cyanobacteria occur every time temperature rises?

WITNESS STARR: Not necessarily. They might be out-competed.

MR. BERLINER: And might there be other factors at play that would prevent cyanobacteria from

growing or microcystis from growing simply because temperature rises.

WITNESS STARR: Absolutely.

MR. BERLINER: So in your testimony, you contend that Dr. Bryan did not analyze temperature impacts on the American River, correct?

WITNESS STARR: I don't think that's what I said. I know that they did. They looked at Watt Avenue, so -- I don't believe that's what I wrote.

What I said was that they analyzed the Sacramento River at Knight's Landing, which is 30 miles upstream of the Sacramento River Water Treatment Plant. And that does not include the impacts of Oroville and Folsom because the Feather River comes in at River Mile 80, and the American River comes in at River Mile 60.

So those impacts are not included in the Sacramento River impacts. It in now way means -- affects the evaluation that was done on the American River.

MR. BERLINER: Regarding DSM-2 flow velocities, do I understand your contention that the DSM-2 flow velocity calculations might be inaccurate because they assume a constant river cross-section and do not account for areas of asymmetrical bathymetry?

WITNESS STARR: I don't mean to say that

they're lacking precision. Modeling might. But it's an average velocity over an entire area, and it's highly unlikely that the Sacramento or American River has a unique cross-section. And in fact, the American River is well documented to have, you know, lots of sand bars and shallow areas, especially in the lower flow periods.

So those evaluations, you know, they are generalized. They give you an average velocity. But that doesn't account for areas where you might have maybe along the edge of the river, those shallow waters that might be back eddy or something like that, much lower velocity.

It just over simplifies the situation.

MR. BERLINER: Are you aware that there was recent DSM-2 calibration, including bathymetry for the Sacramento River?

WITNESS STARR: No, I have not reviewed the details of model calibration. I went to the DWR website to understand how cross-section was used in the calculation of velocity because that's really all I could do. As a civil engineer, you know, I have the general knowledge of flow and area and velocity. So I wanted to try to understand it a little bit better.

But as I said, I'm -- you know, I don't have

the resources of DWR modelers at my -- that can explain it to me in any more detail than what is on the website, so that's what I used.

MR. BERLINER: So are you -- were you able to discern how flow is calculated -- is computed in DSM-2?

WITNESS STARR: I don't -- I don't have access to understand the model other than what was written on the DWR website where they talk about selecting cross-sections.

MR. BERLINER: Okay. Let's turn to Dr. Owen if we could, please.

WITNESS STARR: Oh, oh, another -- okay.

MR. BERLINER: In your testimony, you had some critique by Dr. Owen. Are you aware that he used a predictive model?

WITNESS STARR: Yes, I -- I'm very familiar with the model that he referenced, Amy, et al.

MR. BERLINER: And is it -- are you familiar with how a predictive model works?

WITNESS STARR: Yes.

MR. BERLINER: So you understand that predictive models were vary a single factor so that the effect of that change can be determined?

WITNESS STARR: Yes.

MR. BERLINER: Are you aware that --

concerning -- let's just make sure that we -- we understand the verbiage the same.

Do you understand the abbreviation TTHM to mean total trihalomethanes?

WITNESS STARR: Yes.

MR. BERLINER: And do you understand the abbreviation HAA5 to refer to haloactic acid?

WITNESS STARR: It's "haloacetic acid," and there's five of them.

MR. BERLINER: Sorry.

WITNESS STARR: That's what the "5" is.

MR. BERLINER: And you understand DBP to be disinfection byproducts?

WITNESS STARR: Yes.

MR. BERLINER: And WTP is an abbreviation for the water treatment plant?

WITNESS STARR: Yes.

MR. BERLINER: Great. Thank you.

So do you agree that there are multiple factors at work to effect total trihalomethane formation?

WITNESS STARR: Yes, that was stated in my original testimony as well.

MR. BERLINER: How can the effect of a change in a single factor be determined if multiple factors

are changing concurrently?

WITNESS STARR: Well, it would be very difficult predictively.

MR. BERLINER: And did I understand that you are familiar with the Amy model?

WITNESS STARR: Yes, I am.

MR. BERLINER: And that was a model developed by the EPA and used by Dr. Owen, correct?

WITNESS STARR: It was not -- it was presented by the EPA. I would like to note that the equations that Dr. Owen references are actually not the equations in the Amy reference. These are based on total organic carbon. And the Amy et al. were bench scales using dissolved organic carbon.

So there has been some translation. I'm not questioning the validity of these. They're just not the reference that the cited. And so these coefficients and these exponents are different. And I believe that these are probably equations that Mr. Owen was involved.

So dissolved organic carbon is really the reactive part of carbon that can actually combine with a disinfectant to form these disinfection byproducts. but total organic carbon is really what water treatment plants monitor. And that is what U.S. EPA tells us to

monitor. It includes dissolved as well as particulate carbon. So the U.S. EPA developed --

CO-HEARING OFFICER DODUC: I think you need to get back to Mr. Berliner's question. Even though I find it fascinating, Ms. Starr.

MR. BERLINER: I appreciated the explanation.

WITNESS STARR: Yeah. It's just that there was variability in the assessment that was done, so.

MR. BERLINER: Are you aware there have been recent updates to the Amy model?

WITNESS STARR: There have been numerous through the years. And because those models are bench scale, and they were for raw waters, not treated waters. So they've tried to apply that more to treated waters, such as the City's treated water quality that we talked about.

MR. BERLINER: And do you understand that the Amy model is an empirical predictive equation that applies the best fit relationship to real measured data?

WITNESS STARR: It's for bench scale.

MR. BERLINER: Maybe you could define that for the benefit of the record, please.

WITNESS STARR: So that means that it doesn't include a real world scenario. It's not -- at a water

treatment plant, it's different raw waters that were tested in jars. And it empirically defines limits based on jar tests that were done in a perfect jar-test world.

MR. BERLINER: And you understand that there are about 7- to 800 observations that are included in the model for TTHMs and HAA5.

WITNESS STARR: Yeah, but that, there's -- in that model, there's the raw waters.

MR. BERLINER: My question is are you aware of it? Let's take it one at a time.

WITNESS STARR: So within the Amy et al. there are multiple levels. There's the raw water model, and then there's attempts at coagulated with alum and coagulated with ferric. So it's possible that, between all of those, they might have 700. I don't know how many might relate to each of the different waters that were bench scale tested.

MR. BERLINER: Are you aware that there are boundary conditions within the Amy model?

WITNESS STARR: Yes, I am.

MR. BERLINER: And are you aware that Dr. Owen testified that the City of Sacramento's intake is within those boundary conditions?

WITNESS STARR: I'm not sure that he would

know that because one of the conditions is time. And I don't believe he's worked for the City of Sacramento and understands the age of water in their distribution system. So I'm not sure that he could testify that he knew that 168 hours might be the limit of water age in the City's system. And that is the limit of the model.

MR. BERLINER: So you don't know one way or another what he knows, correct?

WITNESS STARR: I don't. I don't believe he's worked for the City of Sacramento, so.

MR. BERLINER: Do you understand that, when Dr. Owen used the Amy model, all the factors were held constant to specifically evaluate the impact of temperature?

WITNESS STARR: I'm sorry. Can you repeat that?

MR. BERLINER: Sure. Do you understand that Dr. Owen -- when Dr. Owen used the Amy model, all the factors were held constant to specifically evaluate the impact of temperature?

WITNESS STARR: So in Mr. Owen's testimony, I was -- looked at the analysis that he did, and I was unable to ascertain what specific values that he assigned for something like TOC, for bromide, temperature. So it was not possible and as well for

Dr. Michael's testimony. I couldn't actually look at what specific assumptions they were making with regard to those levels.

I know it's somewhere in the -- it should have been somewhere in the range, but they didn't say what -- what assumptions they were using for the various variables in the equation.

Therefore, it sort of limited my ability to assess it other than to look at the one-degree projection that he did and compare it to our one-degree actual.

MR. BERLINER: Are you familiar with Dr. Owen's experience?

WITNESS STARR: Mr. Owen -- I'm familiar, yes, I am. I've worked with him in the past. And also looked at his statement of qualifications.

MR. BERLINER: But you've worked with him in the past?

WITNESS STARR: We both worked for the California Urban Water Association on the drinking water policy.

MR. BERLINER: As part of your critique, you criticized the use of annual averaged temperatures, correct?

WITNESS STARR: Yes.

MR. BERLINER: And part of your critique is to criticize the use of annual average temperatures in determining the scale of -- relative scale of temperature impacts on disinfection byproducts, correct?

WITNESS STARR: Right.

MR. BERLINER: And you are arguing that shorter term temperatures are more relevant than longer term temperatures, correct?

WITNESS STARR: Yes.

MR. BERLINER: On Page 5 of your testimony, did you not use the average annual surface water temperature to imply that increases in temperature resulted in increased total trihalomethane formation in 2012-13?

WITNESS STARR: No, my rebuttal -- my surrebuttal is limited in scope to what was presented to me. And they looked at annual average temperatures and made projections based on a one-degree average annual. So all I wanted to is verify, is that valid? Are we there? And so I used their logic, not my logic, their logic in saying, "Okay. Well, from 2012 to 2013, we had a 1 1/2 degree annual average temperature difference. So maybe those numbers are close."

Well they're not even close. The projections

that they had were an order of magnitude below what our actual increases were.

So it's not that I supported that line of logic. It's I was trying to be able to assess the validity and the applicability of that line of logic to our actual data.

MR. BERLINER: Are you aware that Dr. Owen used the maximum increase in water temperature on a monthly basis?

WITNESS STARR: I don't understand what you mean by that.

MR. BERLINER: Well, in other words, Dr. Owen didn't take temperatures over a month and average them out. He used the maximum increase.

WITNESS STARR: So he used one degree Fahrenheit. And I did not question how he came up with that. I was just looking at that that was his assumption. And however he came up with it I don't know.

MR. BERLINER: So you didn't understand that one degree is actually the number that fell out when he looked at the maximum?

WITNESS STARR: I read it, and I understood what he was saying.

MR. BERLINER: So in your testimony, you

reported observations of locational running averages for total trihalomethanes and haloacetic acid, correct?

WITNESS STARR: Yes, that's as reported. So Mr. Owen went to the City of Sacramento Consumer Confidence Reports, which are public documents available. And he got those numbers from the report and used those in his rebuttal testimony. So I focused on using those numbers as well.

MR. BERLINER: And by the way, who drafted that report? Do you know?

WITNESS STARR: What report?

MR. BERLINER: The Consumer Confidence Report.

WITNESS STARR: Oh, the City of Sacramento is -- every water utility has to prepare those. Pravani Vandeyar, who testified in the original -- she was one of my co-witnesses I guess you could say. And she is the City's water quality superintendent. So she would be responsible for ensuring all the water quality data was pulled together.

But I'm sure it's completed through a public information officer of some sort. It's public outreach document. It's required by state and federal law.

MR. BERLINER: During the 2012-to-'13 time period, you reported an average annual increase of 1.5 degrees Fahrenheit, correct?

WITNESS STARR: Yeah, that's just based on the water temperature, the average daily temperature at each plant during periods of operation.

MR. BERLINER: Did you assume that, over this time period, that TOCs were stable based on the average annual TOC concentrations?

WITNESS STARR: No. In fact, I went back to the Consumer Confidence Report because Mr. Owen had expressed some concern the impact total organic carbon might have because it is one of the variables in the formation potential. And so I used those same numbers from the Consumer Confidence Report, the average annual total organic carbon. And in 2012, it was 1.9 and in 2013, it was 1.3. So it was 30 percent less, in fact. So it was highly improperly that it's a cause or relation to the increase in DBPs in 2013.

MR. BERLINER: Do you agree that substantial difference or that difference of 1.9 to 1.3 eliminates TOC levels as a potential causative variable?

WITNESS STARR: When looking at their logic and their philosophy, that's what they applied. If I was asked to do such an evaluation, I would have done it entirely different than they did, so.

MR. BERLINER: I don't think you really answered my question.

WITNESS STARR: Can you repeat the question?

MR. BERLINER: Sure. This drop of TOCs between the two years, from 1.9 milligrams per liter to 1.3 million grams per liter, doesn't that decline eliminate TOC levels as a potential causative variable?

WITNESS STARR: It shows that, on an average basis, it couldn't have possibly contributed to higher levels because it was lower in the second year.

MR. BERLINER: The samples for -- the samples for determining disinfection byproducts were taken on one day, correct?

WITNESS STARR: So the location running annual average is calculated at each site, and it's based on four samples collected 90 days apart over one year. So it's -- they are -- samples are taken on one day, but every quarter you collect it. And they have to be 90 days apart, so it's not like you can take two right next to each other on opposite sides of the quarter. And you do a running annual average. So every quarter, you're calculating a compliance point based on the four previous quarters.

MR. BERLINER: And for each of those four days, there are other variables that could affect the formation of disinfection byproducts other than TOCs, correct?

WITNESS STARR: Yes.

MR. BERLINER: And those could include free chlorine dosage, for example?

WITNESS STARR: So if you look at the testimony provided by Mr. Owen, they have the equations for the predictive. And so TOC chlorine residual, bromide, temperature, pH, and time are all what are known to be very significant influences on how DBPs form, so, yes.

MR. BERLINER: Did you consider those other factors?

WITNESS STARR: I wasn't conducting an evaluation of that. I was evaluating the analysis prepared by Mr. Owen.

MR. BERLINER: So you didn't look at those?

WITNESS STARR: Not as part of my evaluation of his analysis. He didn't look at them.

MR. BERLINER: So in looking at your actual data, did you look at other time periods other than 2012-2013? Let's say, 2014-15, for example.

WITNESS STARR: Well, I did. When I presented in the City Sac 37, you can see there's an average annual temperature for each year. So, for instance, it was another -- 2014 had a 65.9-degree Fahrenheit temperature, and 2015 had a 67.1 Fahrenheit

temperature.

So each of those subsequent years had higher THHMs and s and had higher temperature. And I also did look at total organic carbon, and it was 1.3 for 2013, 2014, and 2015, so no change.

MR. BERLINER: So for the 2014-15 time period, do you understand the total trihalomethane concentrations only increased by 1.4 percent, not 10.7 percent?

WITNESS STARR: I do. Yeah. The difference is that -- and you can see in Mr. Owen's testimony. The temperature increase, when you're at lower temperatures and you have those increases, smaller increases at lower temperatures are more significant.

And so a similar increase at a higher temperature might not have such a significant effect. So, yes, I did look at that.

MR. BERLINER: Okay. We don't have any further questions. Thank you very much.

WITNESS STARR: You're welcome.

CO-HEARING OFFICER DODUC: Thank you.

Mr. Miliband, any redirect?

MR. MILIBAND: No, thank you.

CO-HEARING OFFICER DODUC: All right. That completes the witnesses and surrebuttal presentation

from Group 7.

At this time, do you wish to move your exhibits into the record?

MR. MILIBAND: Oh, Mr. Bezerra's here. He came back. I was prepared to indicate that we would, but I think there was some discussion about submitting letters. But I'll let Mr. Bezerra speak first.

CO-HEARING OFFICER DODUC: Our typical process last time in the rebuttal phase was to verbally move the exhibits into the record and then giving the parties 24 hours to submit a written list if there's any clarification that are necessary.

We actually do have, I believe, your index of exhibits.

MR. BEZERRA: I believe Ms. Nikkel stated as that panel was leaving we were planning to submit a list -- move the exhibits of the MBK panel into evidence via letter by close of business on Monday.

We could --

CO-HEARING OFFICER DODUC: Is there a reason why the list that we currently have, the exhibits, is not correct?

MR. BEZERRA: No, I don't believe so. It's just simply we have multiple parties in Group 7, each of -- all of them moving different exhibits into the

record. So we wanted a clear record where we have joint exhibits with the MBK panel, we have Sacramento County Water Agency exhibits, and we have City of Sacramento exhibits. And so we wanted to do it by separate letters to make sure we had clarity as to who was moving what into the record.

I, for instance, do not represent any clients on the latter two Group 7 panels.

CO-HEARING OFFICER DODUC: Okay. All right.

MR. BEZERRA: Along those lines, though, in relation to moving exhibits into the record, having heard your instruction earlier today about if we were done cross-examining witnesses for surrebuttal we should move our cross-examination exhibits into the record, I have no -- I personally have no further plans to cross-examine witnesses on surrebuttal. So I'd like to move my cross-examination exhibits into the record.

CO-HEARING OFFICER DODUC: Are you speaking on behalf of all of Group 7?

MR. BEZERRA: I'm only speaking on behalf my firm.

CO-HEARING OFFICER DODUC: I'd rather not break up the group since you guys have done such a great job coordinating together.

MR. BEZERRA: Okay. So just for clarity,

then, what we'll do is, I guess, wait until the end of surrebuttal and move all of Group 7 into the record.

CO-HEARING OFFICER DODUC: All of Group 7's cross-examination exhibits.

MR. BEZERRA: Cross exhibits. Okay.

MR. MILIBAND: And as for our exits for direct testimony, what would please the Hearing Officers most to do, as Ms. Nikkel, I think, was planning for Monday or --

CO-HEARING OFFICER DODUC: At this time, it is 4:30 on a Friday afternoon. I am very happy to accommodate Ms. Nikkel's request.

I don't believe -- unless the Department is going to raise an objection now -- that there are any objections, outstanding objections, upon which I have not rule or outstanding motions upon which I have not ruled with respect to Group 7's surrebuttal testimony exhibits.

So in that case, I will go ahead and close the window in terms of filing, unless -- Ms. Meserve?

All right. I will close the window for filing objections, written or verbal, in response to the admissibility of Group 7's surrebuttal testimony. And I look forward to receiving your written --

MR. BEZERRA: Our written communications

moving all of those exhibits into the record.

CO-HEARING OFFICER DODUC: Yes, thank you, by end of day on Monday.

Mr. Mizell?

MR. MIZELL: Should the explanation of which exhibits apply to which parties mix up the exhibits referenced in their testimony, I would still be looking to file an objection. I don't anticipate that Mr. Bezerra or any of the attorneys on that side would do that intentionally, but I would certainly want to make sure that I reserve that right.

CO-HEARING OFFICER DODUC: If there are any obvious errors, then obviously we would like to be made aware of them as well.

CO-HEARING OFFICER MARCUS: I'm not a perfect forecast or a perfect --

CO-HEARING OFFICER DODUC: Foresight?

CO-HEARING OFFICER MARCUS: Yes.

MR. BEZERRA: Just --

CO-HEARING OFFICER DODUC: All right.

MR. BEZERRA: -- one further question. It strikes me there's a pretty good possibility that none of Group 7's parties may want to cross-examination some of the later witnesses on surrebuttal.

CO-HEARING OFFICER DODUC: In that case, I am

more than happy to receive those lists of exhibits used for cross-examination to be moved into the record by end of day Monday as well, 5:00 p.m. Monday as well.

MR. BEZERRA: I guess what I'm suggesting is we may get a week or so down the road and Group 7 may have decided that nobody wants to do any further surrebuttal cross, at which point we would move those exhibits into the record, even if surrebuttal has not been completed.

CO-HEARING OFFICER DODUC: Fine.

MR. BEZERRA: Thank you.

CO-HEARING OFFICER DODUC: Just don't come to me later and then request that, to conduct.

MR. BEZERRA: Oh, I understand that would be a very bad move.

CO-HEARING OFFICER DODUC: Yes, it would be very bad. You would then take Ms. Aufdemberge's spot on my list of bad people.

MR. BEZERRA: Oh, okay.

CO-HEARING OFFICER DODUC: Ms. Meserve.

MS. MESERVE: Good afternoon. Osha Meserve for LAND. I was hoping we could briefly discuss the scheduling issue. I know they're not you're favorite, and it's 4:30. I'll try to be quite clear and concise.

CO-HEARING OFFICER DODUC: Okay. Actually,

before you do that, let me recap a couple things just so I have them clear, so staff, the hearing team is clear and everyone has the same understanding. By noon on Monday, I'm expecting to receive from the Department -- I guess the petitioners, I should say, any written objections and/or motion pertaining to Ms. Taber's cross-examination as they -- as far as the issue of EcoRestore is concerned.

Then I am expecting by Tuesday at noon any responses from Ms. Taber, Ms. Meserve, or anyone else who wished to provide input on that particular item.

I'm also expecting by noon on Monday from Mr. Bezerra, the objections to, I guess, DWR's surrebuttal testimony -- I forget which --

MR. BEZERRA: Department of Interior.

CO-HEARING OFFICER DODUC: Department of Interior. I'm sorry. See, this is why this is good.

Going to have this in writing by noon on Monday, to which then the Department of the Interior has by noon on Tuesday, or anyone else for that matter, to respond to that.

Were there any other outstanding motions and/or objections with respect to petitioners or -- with respect to petitioners that I have missed?

MS. MESERVE: The official notice.

CO-HEARING OFFICER DODUC: Yes. I am reminded that there was an e-mail -- what is this that I've been handed?

MR. OCHENDUSZKO: The request for judicial notice by DWR.

CO-HEARING OFFICER DODUC: Oh, yes, thank you. I did forget that.

This was DWR's request for -- with respect to Mr. Davis and with respect to notice of judicial notice to whatever -- request of judicial notice which they submitted yesterday. I -- pursuant to my discussion with Ms. Womack earlier today, so, so long ago today. Anyone who wished to provide responses to that may have until Tuesday at noon to do so.

I don't think I said this, but I guess this is what staff is proposing? Staff is proposing that petitioners have until noon on Wednesday to respond to those -- all right. Since I've already -- don't hand me pieces of Post-Its like this at 4:35 in the afternoon.

All right. Mr. Mizell, you may have until noon on Wednesday to respond to anything that comes in by noon on Tuesday with respect to your request regarding Mr. Davis and his testimony and the official notice. May I get to Ms. Meserve now?

All right. Ms. Meserve.

MS. MESERVE: There was also just -- Des Jardins submitted an objection, so I don't know if you want to make a deadline for petitioners to respond to that. I don't know if you need --

CO-HEARING OFFICER DODUC: Yes, Ms. Des Jardins submitted an objection to DWR's exhibit. I'll give you the same deadline to which you will be responding to -- actually, no. That was -- Mr. Bezerra's objection is as to the Department of Interior's exhibit.

Ms. Des Jardins' objection is with respect to DWR's exhibit. So DWR, you will also have till noon on Tuesday to respond to Ms. Des Jardins' objection.

MS. MESERVE: Okay.

CO-HEARING OFFICER DODUC: I'm so glad so many people are taking notes of all these little details.

MS. MESERVE: Okay. So my question pertains to scheduling. We have a large group of us that had requested to go in -- we ended up in order 13 to present the testimony of Dr. Michael Brett regarding harmful algal blooms. And I'm just trying to plan ahead. And I know it's very difficult.

He is up in Washington, so I need to make travel plans for him. And I'm also trying to economize

to try to get him in on a day, you know, if I can.

So I am wondering if it might be possible -- and I've conferred with Central and South Delta, which is in order No. 10. And they don't mind if we switch with them; either which way doesn't matter.

But looking at what all we have to do and with, I think, the Paulsen testimony likely taking half a day or maybe more, I'm wondering if we might be able to bring Dr. Brett on the July 11th? Because I'm afraid to put him on the 27th, which is a part day.

CO-HEARING OFFICER DODUC: All right. By the way, before I get to that, let's remind everyone that, when we resume on Thursday in Coastal Hearing Room, we actually will begin with Mr. Mizell, the witness that you're bringing in and are coordinating with Ms. Spaletta on with respect to the spreadsheet that we provided earlier today.

So we will begin with that before we get to any other surrebuttal presentation.

And so looking at the schedule, next week we have, I believe, the 29th -- I'm sorry, the 22nd -- I'm looking way ahead -- the 22nd and the and 23rd. And I am thinking that we will need a lot of that for Dr. Paulsen.

East Bay MUD also has a presentation. Central

Delta -- so, Ms. Meserve, you are proposing that --

MS. MESERVE: July 11th.

CO-HEARING OFFICER DODUC: Which would be -- would that be our next?

MS. MESERVE: Yes. You have a half-day afternoon scheduled on the 27th.

CO-HEARING OFFICER DODUC: Would anyone object horribly if we cancel that half day? Because that's the only half day being scheduled for that entire week.

I see a lot of happy smiling faces. So let's go ahead and do that. We will send out a notice, please, Mr. Ochenduszko canceling that half a day for the entire week of July 26th [sic] that has been scheduled. So, then, yes. You guys are having a nice long break. What would you do?

MR. OCHENDUSZKO: Tam, I'm sorry, I got reminded by the court reporter here, so we're verbally canceling June 27th.

CO-HEARING OFFICER DODUC: Yes, I'm sorry. Did I say something else?

MR. OCHENDUSZKO: Yes. July.

CO-HEARING OFFICER DODUC: Oh, I was so looking forward to canceling things. Yes.

So, yes, then our next occasion to get together will be July 11th. All right.

Ms. Meserve, I'm willing to allow you that July 11th for your witness. Assuming that it will be -- for some reason speed through quicker than that, you have arranged for someone else to take your place?

MS. MESERVE: Well, which day? I'm here on the 22nd and the 23. What I'm guessing is that, if I was to fly Dr. Brett down, he probably wouldn't go. So that's why I was looking for a date to arrange.

What I can do, obviously, is see where we're at at the end of the week, and if the 11th seems like not the right day, it's easy enough for me to reschedule him to the 12th or something like that at that point.

CO-HEARING OFFICER DODUC: All right. Let's do that then.

MS. MESERVE: Thank you very much.

CO-HEARING OFFICER DODUC: Now may I go home for the weekend? All right. Is there anything else we need to address?

(No response)

CO-HEARING OFFICER DODUC: All right. Thank you everyone. Thank you, Ms. Starr.

And with that, we are adjourned until next Thursday, 9:30 in the Coastal Hearing Room.

(The proceedings recessed at 4:40 p.m.)

STATE OF CALIFORNIA)
) ss.
COUNTY OF MARIN)

I, DEBORAH FUQUA, a Certified Shorthand Reporter of the State of California, do hereby certify that the foregoing proceedings were reported by me, a disinterested person, and thereafter transcribed under my direction into typewriting and is a true and correct transcription of said proceedings.

I further certify that I am not of counsel or attorney for either or any of the parties in the foregoing proceeding and caption named, nor in any way interested in the outcome of the cause named in said caption.

Dated the 23rd day of June, 2017.

DEBORAH FUQUA

CSR NO. 12948