BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

CALIFORNIA WATERFIX WATER RIGHT CHANGE PETITION HEARING	))))

CALIFORNIA REGIONAL WATER QUALITY BOARD

CENTRAL VALLEY REGION

11020 SUN CENTER DRIVE

HEARING ROOM

RANCHO CORDOVA, CALIFORNIA

PART 2

Monday, February 26, 2018

9:30 A.M.

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Pages 1 - 212

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

Andrew Deeringer, Staff Attorney
Conny Mitterhofer, Senior Water Resources Control Engr.
Jean McCue, Staff

For California Department of Water Resources

Tripp Mizell, Senior Attorney

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

U.S. Department of the Interior, Bureau of Reclamation, and Fish and Wildlife Service
Amy Aufdemberge, Assistant Regional Solicitor

State Water Contractors

Stefanie Morris
Adam Kear
Becky Sheehan

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

(Continued)

APPEARANCES (continued)

San Luis and Delta-Mendota Water Authority
Daniel O'Hanlon

South Delta Parties
John Herrick

East Bay Municipal Utilities District
John Salmon
Fred Etheridge

California Sportfishing Protection Alliance, California Water Impact Network, AquAlliance
Michael Jackson
Chris Shutes

Tehama-Colusa Canal Authority & water service contractors in its area - and Sacramento Valley Group
Meredith Nikkel

Sacramento Regional County Sanitation District, and City of Stockton
Kelly Taber

Clifton Court Forebay LP
Suzanne Womack

Contra Costa County
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County of Solano
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Local Agencies of the North Delta
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Grassland Water District
Ellen Wehr

National Resources Defense Council, et al.
Doug Obegi

County of San Joaquin, San Joaquin County Flood Control and Water Conservation District and Mokelumne River Water and Power Authority
Thomas H. Keeling

San Joaquin Tributaries Authority
Tim Wasiewski

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I N D E X

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Monday, February 26, 2018 9:30 a.m.

PROCEEDINGS

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CO-HEARING OFFICER DODUC: Good morning, everyone. Everyone had a nice weekend, and welcome back to the rain. And welcome back to Water Right Change Petition Hearing for the California WaterFix project.

I am Tam Doduc. With me to my right is Board Chair and Co-Hearing Officer Felicia Marcus. I think we will be joined by Board Member D'Adamo. We hope to have her join us; otherwise, I know she'll be watching on the Web if she's not here.

To my left are Andrew Deeringer, Conny Mittenhofer, and Jean McCue. We are also being assisted today by Mr. Baker and Ms. Perry, as well as others in the mission control room back there.

A couple of announcements and we'll get to housekeeping. As you know, we are in a new location here today, so please take this announcement seriously. Take a look around, identify the exit closest to you. You have four to choose from. In the event of an emergency, an alarm will sound. We will evacuate. There are no stairs to be taken because we're on the first floor. But please exit building, and we will

regroup in the parking lot to wait for the all-clear signal.

Secondly, as always, this meeting is being Webcasted and recorded. So please provide your comments by speaking into the microphone, and please begin by identifying yourself.

For the court reporter's -- oh, and the court reporter's here, and she'll be recording. And the transcript will be made available at the end of Part 2. If you would like to have it sooner, please make your arrangements with her directly.

For her purposes, though, she will not be able to see who is speaking among those who are in the second row there for Panel 2 witnesses. So as you are responding to questions, or providing other comments today, if you could please announce yourself to her before you begin or as you begin. That would be of tremendous help her.

Everyone else, of course, will do the same as they come up to the microphone to provide any questions or comments. I think I'm on my third and most important announcement. Please take a moment -- even though we are in a new location, this is still the most important thing you will do today. And that is take a moment to put all your noise making devices to silent,

vibrate, do not disturb, especially do not disturb the Hearing Officer.

Please take a moment and check, even though you think it might be off. And I see the chair doing so. Thank you. All right. Before we begin, a couple of housekeeping items. I have to refocus because the time is on this side. My usual is on the right.

Mr. Mizell, we had asked you, I believe, to look into the status of the Department's response to Ms. Womack and Ms. Des Jardins PRAs.

MR. MIZELL: Yes, thank you. Tripp Mizell, DWR.

We did search all of the requests that we received from the Public Records Act. And at this time, there are no outstanding Public Records Act requests from Ms. Womack; they have all been responded to.

And as to Ms. Des Jardins' subpoena, we were unable to locate any subpoena served upon us at this point. And we have not received any motion to compel. Those were the two claims that I recall hearing on Friday. We also did a search of the PRAs, and we believe we've responded to her PRAs.

CO-HEARING OFFICER DODUC: Before you begin, I understand that you may not, Ms. Womack, be getting the

information you expect to get from the Department as a result of your PRAs. But that is a matter for you to work out with the Department it's not a matter that we get involved in as a matter of enforcing PRAs. So keep that in mind as you respond.

MS. WOMACK: Thank you so much.

CO-HEARING OFFICER DODUC: There should be a "speak" where the red light comes on.

MS. WOMACK: Okay. Got it. Yes. Thank you so much. No, there -- there were -- November 14th, I gave three different PRAs to DWR. And they said they would respond to them, and they have voluminous texts. I have all the documents here, and I'd be glad to upload them.

CO-HEARING OFFICER DODUC: No.

MS. WOMACK: Anyway, "voluminous," to me, does not mean two documents. And they simply did not respond to anything to -- about dredging and things that have very much to do with my case with access to waterways, to the river and the rocking of levees, very much to do with fishermen, my own fishermen at my place.

And also in -- in response to what was happening, I made an April 11th request to the then-director for information. I didn't know it was a

Public Record Act request at that point, but did I ask for information. I then restated it in a PRA.

And I'm simply not getting public information like, did you -- what timely manner did you let people know there was an emergency at Clifton Court?

CO-HEARING OFFICER DODUC: Ms. Womack.

MS. WOMACK: All kinds of things that I think is alarming.

CO-HEARING OFFICER DODUC: Ms. Womack, a Public Request Act [sic] request is a request for documents.

MS. WOMACK: Yes.

CO-HEARING OFFICER DODUC: It is not a request for response to questions. It is not a request for inquiries to questions you might have. It's simply a request for documents.

MS. WOMACK: Yes, and I've received documents after the fact from DWR and from people -- from fellow protestants that I think should have been provided by DWR. And I would be glad, again, to put these on the Web to you. I'm just not getting documents from DWR.

CO-HEARING OFFICER DODUC: Ms. Womack, two things: one, it is between you and DWR on the compliance issue of the PRAs; and, two, documents that you discover, if they are appropriate and germane to

the key hearing issues before us, if you believe they are part of your case, you could introduce that as part of your case in chief for Part 2 or as part of your rebuttal.

MS. WOMACK: One document I'm referring to --

CO-HEARING OFFICER DODUC: We are not going to go through the documents now.

MS. WOMACK: Well, but I'm having trouble because I've written -- I'm a land owner. I live next to a dam, and I've only just been told it's a dam. I've been going on for a long time about it seeping, causing damage. No -- I understand.

But in March, it turns out that right where I have all the seepage, there's a huge problem. I've written the directors, all four of them, in this last year.

CO-HEARING OFFICER DODUC: Ms. Womack --

MS. WOMACK: And no one has responded. Who do I respond -- who do I go up to?

CO-HEARING OFFICER DODUC: Ms. Womack, I appreciate that this is a forum to which you've been engaged in, but that is not an issue that we can help you with. This is something you will have to take up with the Department.

MS. WOMACK: So the -- the fact that --

the Department can simply not respond. And this is how they'll respond when the forebay and the intermediate forebay leaks?

CO-HEARING OFFICER DODUC: Ms. Womack --

MS. WOMACK: This is what I'm dealing with.

CO-HEARING OFFICER DODUC: Ms. Womack, they have said they have responded. To the extent that you disagree with their response, that again is a matter for you to take up with them.

To the extent that you believe this is germane to a case before us --

MS. WOMACK: Absolutely.

CO-HEARING OFFICER DODUC: -- you may bring that up during your case in chief or rebuttal. Now is not the time.

MS. WOMACK: I can't bring it up in my case in chief unless you allow me to put it in now --

CO-HEARING OFFICER DODUC: No.

MS. WOMACK: -- because the time is over.

CO-HEARING OFFICER DODUC: The time is over. You are too late to submit anything for your case in chief right now. But rebuttal is still coming up.

MS. WOMACK: But -- well, you know --

CO-HEARING OFFICER DODUC: Ms. Womack, we have taken up enough time. And I cannot assist you with

legal advice. That is a matter that you need to work out yourself.

MS. WOMACK: This is a public -- I am We The People. I am the person, along with the fish, that you're protecting.

CO-HEARING OFFICER DODUC: Yes, but you, as a party to this hearing, must abide by the rules and procedures. And that includes working within the time frame that we've set out, submitting materials by the deadline, and complying with the relevancy of the key issues that are before us.

This is not the part for you bring up past grievances with the Department.

MS. WOMACK: But the Department doesn't have to give me answers; that doesn't seem right.

CO-HEARING OFFICER DODUC: The Department has said they have given you an answer.

MS. WOMACK: They haven't.

CO-HEARING OFFICER DODUC: Now we are done.

MS. WOMACK: Thank you for your time.

CO-HEARING OFFICER DODUC: Ms. Des Jardins? By the way, before you begin, I will acknowledge that you have a couple issues before us that we will need a little bit more time. So we'll try to get back to you after the lunch break today regarding your request for

clarification of our last ruling as well as, I think, a matter that you raised on Friday regarding a request that I took into consideration at the closure of Part 1.

So those things are still outstanding. As long -- also, I think you had a request with respect to subpoenas, and we will also get to that after lunch.

MS. DES JARDINS: Thank you. There was -- before we get to the issue of PCFFA's subpoena --

And, Mr. Mizell, I'm going to give you a copy just to refresh your memory. This is the subpoena filed on July 8th, 2016 by PCFFA. I have worked with PCFFA to subpoena the documents. Please examine it while I bring up this other issue.

I noticed when I was preparing an answer to support for Mr. Obegi's two introduced exhibits that there appeared to be a discrepancy between the hearing ruling on February 21st, which stated that the Department of Water Resources, in their written submission, had said they will submit the supplemental EIR for the hearing record and make their parties available for cross-examination.

And when I looked on the actual February 9th submission, it stated that they were proposing that the permit be issued based on the record in Part 2 and that

the Supplemental EIR would only be produced after the Department was --

CO-HEARING OFFICER DODUC: Ms. Des Jardins, are you making an argument with respect to Mr. Obegi's line of questioning and cross-examination exhibits and DWR's objection?

MS. DES JARDINS: It's not an argument. It's just a factual matter about what the Department of Water Resources in fact said in their written submissions to the Board. And I think it's an important factual point that we clarify.

CO-HEARING OFFICER DODUC: And you may feel free to do that in whatever submission -- you've made a submission to us already. Was that already reflected?

MS. DES JARDINS: Yes, it's in our written submission.

CO-HEARING OFFICER DODUC: Then you do not need to repeat it today. We will consider that along with all other responses that we will receive by 5:00 p.m. today.

MS. DES JARDINS: Thank you.

So, Mr. Mizell, have you had a chance to review the PCFFA subpoena?

CO-HEARING OFFICER DODUC: Actually, before you answer that, Mr. Mizell...

This is PCFFAs subpoena. Why are you pursuing their subpoena and not PCFFA's representatives? And by "representatives" I mean their attorney.

MS. DES JARDINS: Their attorneys are extremely overloaded and may not be able to personally be --

CO-HEARING OFFICER DODUC: And you have taken it upon yourself to pursue their subpoena from two years ago?

MS. DES JARDINS: No, I've pursued that subpoena consistently. There was -- I filed a written request, which I have a copy of here.

CO-HEARING OFFICER DODUC: And what standing do you have to do this?

MS. DES JARDINS: I -- I argue that I have standing because I filed a written request. I was told to file a subpoena. As a pro per, I cannot file an affidavit for a subpoena duces tecum.

And hearing Counsel Dana Heinrich did contact me in response this interrogatory about what information you're maintaining with regard to the development of the hydrologic modeling, that I needed to file a subpoena.

And I worked with PCFFA's attorney, because I was unrepresented, to file a subpoena duces tecum. The

Department of Water Resources clearly recognized that it was in connection with me because they filed a response in their response to my August 1st filing. And they also provided a response -- I sent --

CO-HEARING OFFICER DODUC: Sorry, Ms. Des Jardins --

MS. DES JARDINS: -- a --

CO-HEARING OFFICER DODUC: Ms. Des Jardins.

MS. DES JARDINS: -- response for the record about response for those documents.

CO-HEARING OFFICER DODUC: And so I'm at a loss because, if your request has been responded to -- you may disagree with what information was provided, but that does not mean that we have to continue to play out these requests if the Department has already responded.

MS. DES JARDINS: The Department's response was evasive, incomplete, and the statement that they have provided all documents responsive to the subpoena --

CO-HEARING OFFICER DODUC: That is a disagreement --

MS. DES JARDINS: -- was incorrect.

CO-HEARING OFFICER DODUC: That is a disagreement between you and the Department. It is not

a matter for us.

MS. DES JARDINS: I did. So it is not simply a matter of disagreement. It's --

CO-HEARING OFFICER DODUC: It is not a matter before us.

MS. DES JARDINS: It -- to the extent that you stated that you would take it under consideration --

CO-HEARING OFFICER DODUC: I have taken it under consideration, and I have now decided it is not a matter before us.

MS. DES JARDINS: I --

CO-HEARING OFFICER DODUC: You may disagree with me as well, but that is the ruling.

MS. DES JARDINS: Why is it not before you?

CO-HEARING OFFICER DODUC: Because your PRA request is a matter with the Department.

MS. DES JARDINS: It's a subpoena. I would like -- I did file an affidavit of concealment. Part of what was concealed by this false statement was the ex parte correspondence and documents shared with the Water Board which have not been produced for this subpoena.

CO-HEARING OFFICER DODUC: That's a separate motion that you have filed with us.

MS. DES JARDINS: No, this is -- this is

concealed from discovery by the subpoena. It's not separate from this motion. And the statement that all documents are produced was simply false.

CO-HEARING OFFICER DODUC: Fine.

MS. DES JARDINS: Thank you.

CO-HEARING OFFICER DODUC: It's on the record. You said so.

MS. DES JARDINS: All right.

CO-HEARING OFFICER DODUC: Ms. Morris, do you have a subpoena that we need to follow up on as well?

MS. MORRIS: No, I have a teeny tiny housekeeping matter -- Stefanie Morris with State Water Contractors.

I was hoping that the Hearing team could remind everybody about the service list because there seems to be some discrepancies between what people are getting. And I understand that people have e-mail limitations and they're coming in two different batches. But I don't think that I'm getting everything on the service list.

And since everything that's served on the service list is not also posted somewhere -- which is fine -- it's just really important that everybody is using the most up-to date service list and it's getting to everybody. That's all. Thank you.

CO-HEARING OFFICER DODUC: Has your contact information changed? Because you have always been on the service list. So regardless how it's been updated, you should still be on the old one.

MS. MORRIS: I understand, but I'm not getting everything. And I've checked with other attorneys, and they've gotten things that I haven't gotten, which they forward. And I've gotten things they haven't gotten. So it seems to me that we just all need to make sure that we're using the most current list and that everything is going through.

CO-HEARING OFFICER DODUC: All right.

Has everyone noticed that?

All right. Are there any other housekeeping matters? I see Mr. Bezerra in the audience. Let me confirm. Group 7 is still switching places with Group 42 for cross-examination of Panel 2? 45, sorry.

Yes?

MR. BEZERRA: Yes.

CO-HEARING OFFICER DODUC: All right. I have a mind to look this way [indicating].

Mr. Mizell, I think we are ready to get to your next witness.

MR. MIZELL: Thank you. Today we are joined by Dr. Ohlendorf. He has not taken the oath yet.

CO-HEARING OFFICER DODUC: Please stand and raise your right hand.

(Dr. Harry Ohlendorf sworn)

CO-HEARING OFFICER DODUC: Thank you.

MR. MIZELL: Thank you. So today we'll be hearing from Mr. Aaron Miller and Dr. Harry Ohlendorf. And that will conclude our summaries of our written testimony, at which point we can go into cross-examination at your convenience.

DIRECT EXAMINATION BY MR. MIZELL

MR. MIZELL: I have one question or two questions for Dr. Ohlendorf before we begin.

Dr. Ohlendorf, is DWR-1004 a true and correct copy of your statement of qualifications?

WITNESS OHLENDORF: Yes.

MR. MIZELL: Is DWR-1019 a true and correct copy of your testimony?

WITNESS OHLENDORF: Yes.

CO-HEARING OFFICER DODUC: Thank you very much.

We'll now be turning it over to Mr. Miller. Before he begins his oral summary though, I believe there are a couple of citation corrections we would like to make for the record.

Mr. Miller?

WITNESS MILLER: Yes can we bring up Exhibit 1011.

So the first correction I'd like to make is on Page 7 and Line 27. So exhibit SWRCB-84 should be SWRCB-102. And that's reflective of the 2017 certified SEIR.

The second correction I'd like to make is on Page 9 and the Line 19, Exhibit SWRCB-104. This is the -- one of the original BAs; it should be the updated BA, which would be Exhibit DWR-1142.

The third correction is on Page 10, Line -- Line 10. And so the -- two of my exhibits got switched. So the Exhibit 1033 should be DWR-1034. Again, on number -- on Page 10, Line 24 and 25, SWRCB-27, April 3, Footnote 9 should read "Footnote 10."

And then finally on Page 12, Line 14, this is the other exhibit that got switched. This exhibit, should be instead of DWR-1034, it should be DWR-1033.

And then finally, on Page 12, Line 14, this is the other exhibit that got switched. This exhibit, should be -- instead of DWR-1034, it should be DWR-1033.

And that concludes my corrections.

MR. MIZELL: And Mr. Miller, before you begin,

the substance of your testimony has not changed; is that correct?

WITNESS MILLER: That's correct.

MR. MIZELL: Thank you very much.

Mr. Miller, please summarize your written testimony for the Hearing Officers.

CO-HEARING OFFICER DODUC: I don't think you mean Mr. Miller. Or do you?

MR. MIZELL: Yes, Mr. Miller.

CO-HEARING OFFICER DODUC: Sorry.

MR. MIZELL: Yeah, we'll begin with Mr. Miller with the operations, and we'll move to Dr. Ohlendorf after he is done.

CO-HEARING OFFICER DODUC: Got it.

WITNESS MILLER: Good morning. Could we bring up DWR-1025?

My name is Aaron Miller, and I'm a supervising water resources engineer with -- specialist with the Department of Water Resources. I work in the Water Operations Office. This is the office that manages the water for the State Water Project.

I've worked in this office now for a little over 11 years and have had a number of responsibilities, including scheduling exports and releases for real-time water operations management and

evaluating State Water Project operations with models like CalSim.

I have about seven years of prior experience working with better modeling, primarily hydrodynamic and water quality modeling in the Delta. And so as an operator and a modeler, I have a unique perspective. I understand operations, and I understand modeling, and I understand how modeling relates to real world operations.

So the purpose of my testimony today is to highlight how the State Water Project is managed in real-time operations.

Next slide, please.

So in Part 1 of this hearing, Mr. Leahigh talked about how the project is managed by people and not by models. And these people are operators who get input from biologists. And these folks are making decisions based on actual conditions, and then the model is simulating the aggregate of those decisions.

So in the first part of my testimony today, I'm going to talk about how the State Water Project is managed using real-time operations to meet the regulatory requirements.

In the second part of my testimony today, I'm going to talk about operationalization as a criteria.

And the modeling that supported the California WaterFix petitions included new criteria for the H3+ scenario. But these criteria need to be operationalized before they can be really implemented in real-time operations.

And when I talk about operationalizing, I'm talking about taking an objective and then developing a way to implement the intent of that objective in daily operations. And so in the second part of my testimony, I'm going to describe how the California WaterFix H3+ criteria could be operationalized and then give some examples of how those criteria could have been implemented in 2016.

Next slide, please.

So real-time operation is essentially a process of making decisions based on observed data. And it can really be broken into two components where the first component is the day-to-day operational decisions that are being made to operate the State Water Project's changing hydrologic conditions.

And then the second component is this interagency coordination where Reclamation and DWR are incorporating input from the fisher agencies on operations that are protective of listed species.

And I do want to note here that real-time operations are different than the adaptive management

program. Real-time operations are how -- how the State Water Project is managed to meet criteria, whereas the adaptive management program is a process of evaluating and potentially modifying that criteria.

Next slide, please.

So the first component of real-time operations is this -- the day-to-day operational decisions where the operators are looking ahead and scheduling exports and releases in order to meet the upcoming regulatory requirements.

And as most people are aware, the -- we have a very complex system where we have a time delay from making a reservoir release change to seeing that change in the Delta. And then we have depletions and tidal energy that can change very rapidly.

We have a number of tools to help us inform our decisions. But even with these tools, operators do not have perfect foresight, and changes are often required. And those changes are often the -- those changes are often informed by monitoring of the conditions.

And then those changes are rolled back into new forecasts and then future plans. And it's through this operational planning and real-time adjustments that the State Water Project manages to meet its

regulatory obligations.

Next slide, please.

The second component of real-time operations is where Reclamation and DWR are incorporating input from the fisher agencies who are making determinations based on actual conditions. This coordination happens through the Water Operations Management Team or WOMT.

And this team is a management-level team that facilitates decisions on operations and fishery protection. It's a team that's made up of representatives from Reclamation, DWR, National Marine Fishery Service, U.S. Fish & Wildlife, the California Department of Fish & Wildlife. And it's also monitored by the State Water Board and sometimes the EPA.

The team relies heavily on input from working groups. So I have here listed two groups working primarily in the Delta. And each of these groups assess their respective listed species, the conditions in the Delta, the plan, the project operations, and then they provide this assessment back to WOMT for final decision making.

And so, in summary, these two components of real-time operations, both rely very heavily on actual data to make those decisions.

Next slide, please. My hydraulics are weak.

So now I want to move on to the operationalization of the California WaterFix H3+ and how -- so I want to describe how these criteria can be operationalized and implemented.

So I have three of the main criteria here, and all three of these are Delta specific and ultimately limit the diversions for fishery protection.

Where the pulse protection operations limit the northern diversions, the Old and Middle River flow objectives limit the southern diversions, and the spring outflow target limits both the northern and the southern diversions.

So in the next series of slides, I'm going to describe how each of these could be operationalized and implemented and show you an example of how those could have been implemented in 2016. Within these slides, I'm going to show three plots. And each one of these plots have the same historical conditions and the same California WaterFix conceptual operation that applies these three -- these criteria. The only difference will be that I'm going to highlight where these individual criteria would have been applied.

So next slide, please.

Before going on to the first example, which is

specific to the North of Delta, I want to highlight that there's going to be a number of considerations that go into scheduling the diversions of the North of Delta.

And the modeling assumed various forms of assumptions on these. But I want to focus in on the last bullet or dash, the monitoring for and reacting to fish presence.

The model is not able to simulate actual fish presence, so they used a flow surrogate at Broken Slough instead, whereas, in real-time operations, we'll have the ability to monitor for and react to this fish presence. And this will be used in the fish pulse protection actions.

Let's look at our first example. Next slide.

So the purpose of the fish pulse protection actions is to limit the northern diversions during salmon out migration events. The NMFS Biological Opinion used the Knight's Landing Catch Index in their text analysis. This is an index that is based on actual fish presence in the Sacramento River at Knight's Landing. And consistent with the opinion, I used the Knight's Landing Catch Index in my analysis as well.

So when the Knight's Landing Catch Index

indicates five or more fish, then the northern diversions would be limited to 900 cfs. And this low-level pumping would continue until the Knight's Landing Catch Index indicated less than five fish for five consecutive days or until the Sacramento flows, the bypass flows on the Sacramento, exceeded 35,000 cfs. That's 35,000 cfs passing the last intake.

So on the next slide, this is a demonstration of how those actual fish pulse protection actions would have been implemented in 2016.

Mr. Hunt, can we keep it zoomed out until --

CO-HEARING OFFICER DODUC: Before you get teased by everyone like Mr. Bezerra was on Friday, this is Mr. Baker.

CO-HEARING OFFICER MARCUS: He's actually doing it in the other room. You can't even see him from here.

CO-HEARING OFFICER DODUC: Really? My apologies. I'm impressed.

CO-HEARING OFFICER MARCUS: He can see through walls.

CO-HEARING OFFICER DODUC: Hold on a second.

MS. DES JARDINS: I received an e-mail with a technical request stating that the webcast audio isn't

working. So I just wanted to --

CO-HEARING OFFICER DODUC: Thank you. You know, let's take a break while we address this technical challenge.

Hold on a second.

(Recess taken)

CO-HEARING OFFICER DODUC: My understanding is that our set up is working fine and that some people are hearing the webcast all right. So it might be the matter of an individual setting on the various devices that people are using to access the webcast.

Oh, nope? Not the case, Mr. Bezerra?

MR. BEZERRA: Ryan Bezerra. My observation has generally been that the webcast works much, much better on a Microsoft browser than on any other browser. So maybe that's part of the issue.

CO-HEARING OFFICER DODUC: Oh, Apple discrimination again.

What we'll do is we will continue. We also have one of our staff monitoring the website. Is the staff using an Apple Safari browser or a Microsoft?

MS. MITTENHOFER: Microsoft.

CO-HEARING OFFICER DODUC: Okay. We will proceed.

Mr. Miller?

WITNESS MILLER: Okay. So this slide is demonstrating the pulse protection actions that would have occurred in 2016, based on the historic fish catch at Knight's Landing. But before I get into the details of that, those actions, I just wanted to orient you to this graph.

So we are looking at water year 2016, where the X-axis is time, and the Y axis is flow. And on here, I have the actual historic data from 2016. Those are shown in the solid lines, where the red solid line is showing the historic export South of Delta, which would be Clifton Court and Jones Pumping Plant, and then the blue solid line is showing the resulting outflow from 2016.

I took this historic data and then applied the California WaterFix H3-plus criteria to come up with a conceptual operation. And that is shown in the dotted lines, where the red dotted line is showing the total diversions from the North and the South of Delta, and then the blue dotted line is showing the resulting outflow from that operation.

I also have on here the dashed blue line that is showing the outflow required to roughly meet the D1641 Fish and Wildlife and Western Delta standards. And as can you see, both the historic and the

California WaterFix operations meet that criteria.

And then the green shaded areas are showing where historic fish present at Knight's Landing Catch Index would have indicated fish pulse protection actions.

And so, Mr. Hunt, if we could now zoom into that second pulse. I want to focus in on the second pulse for efficiency and also so we can see the full implementation of this action.

Can we zoom in a little bit more? And then scroll over and show the axes. I just want to look at the second pulse there. Yes. And maybe down a little bit.

So we're focusing in on the second shaded green area. And this fish pulse occurred right at the beginning of a high runoff event, just there in beginning of January. And the Knight's Landing catch Index at the beginning of that first -- or second shaded area indicated five or more fish at Knight's Landing.

And so the -- one of the new diversions was limited to 900 cfs. And we can see that by looking at the dotted red line. It's just a little bit above the solid red line. And this is indicating that the North of Delta is diverting additional water, but it's

limited to that 900 cfs.

And this continues for the most -- most of that second shaded area until we get to the -- near the end of that, where the bypass flows on the Sacramento begin to exceed 35,000 cfs. And so at that point, the northern diversions are able to increase above 900 cfs while still maintaining bypass flows of 35,000 cfs on the -- passing at the intakes. So this demonstrates how actual fish presence could indicate fish pulse protection actions.

So then we go on to the next slide.

The next criteria I want to discuss is the Old and Middle River flow criteria. This is a -- something that we operate to currently under current operations. And it's a measure of -- it's an upstream restriction on Old and Middle River between the Central Delta and the southern exports.

This was introduced with the 2008, 2009 Fish and Wildlife Service and NMFS Biological Opinions. And it ranges between negative 1,250 and negative 5,000, and it's typically in place between January and June. So it's a negative flow because it's a limitation on the upstream flow towards the exports. And so this criteria is primarily met by adjusting the southern diversions.

The California WaterFix H3+ proposes additional OMR criteria in December during the same fish pulse protection action I just spoke of and then again in April and May. But those OMRs being dependant on the flow the San Joaquin River.

And so operating to this new criteria would be just like we do today, where we look at whatever criteria is most restrictive and then operate to that most restrictive criteria.

Next slide please.

So this slide, again, it has the same information as the previous slide, except I'm just highlighting here where those OMR criteria would have been applied.

So the first small shaded area is the same period that the pulse protection actions in December occurred. And then the second shaded area is just showing the extent of the April-May period, where additional OMR criteria have been applied.

So in Part 1 of this hearing, Mr. Leahigh had talked about how the California WaterFix would add additional flexibility in meeting our regulatory requirements. And OMR would be one of those criteria.

So for example, during open safety pumping, if -- so this criteria adds -- makes the southern --

this criteria makes the OMR more restrictive, and then the California WaterFix helps in meeting that criteria because you can shift some of those exports that would have been taken at the South of Delta, and you shift them to the North of Delta. And this is important during health and safety pumping.

For example, in this -- in 2016, the April-May period was primarily being restricted by the spring outflow target, which I'll talk about next. But at the end of May, the -- this new criteria would have restricted the southern exports even further. But because that additional -- that flow could be shifted to the North of Delta, health and safety pumping could be maintained.

Did that make sense? I know I kind of --

CO-HEARING OFFICER DODUC: So why is that not reflected or is it reflected in this chart?

WITNESS MILLER: It is reflected in the chart, but it's behind the chart. I don't have it expressly laid out there.

All right. So that demonstrates where and how the OMR criteria could have been operationalized and implemented in 2016.

Can we move on to the next slide?

So the final criteria I want to discuss is the

spring outflow target. And so the purpose of the spring outflow target is to maintain the three-month average outflow, March to May, as observed under existing conditions with the existing regulatory requirements and the existing infrastructure.

And the intent of this target, it can be operated to by determining a monthly target and operating to that target through the exports down to as low as 1500 cfs. The monthly target in March can be determined using an Eight River Index. And the Eight River Index is essentially a hydrologic indicator of conditions in the Central Valley.

And then in April and May, the target can be determined using the San Joaquin inflow-to-export ratio. And this is a criteria that was described in the 2009 NMFS Biological Opinion. And it's something that we operate currently to. And under that criteria, we reduce exports down to 1500 cfs. But under the spring outflow target, that constraint would be lifted if outflows exceeded that 44,500 cfs.

Next slide, please.

So this slide demonstrates the spring outflow target. And, again, it's the same side as before. But I'm just highlighting in the shaded blue area the extent of that criteria and the -- and here, the top of

the shaded area is indicating the calculated outflow target.

So, Mr. Hunt, can we zoom in to the March -- also showing the axes.

So as we -- in 2016, as we enter into March, we can determine a target based on the Eight River Index, forecasted Eight River Index, to be 19,000 cfs. So in March, the top of the shaded blue area is indicating that 19,000 cfs target. However, as you can see, the first week or so, the outflows were lower than that target. And so the total diversions under the California WaterFix conceptual operation, as shown in the dotted red line, is dropped to 1500 cfs in an effort to increase outflows to that target.

And so you can see the dotted blue line then increases a bit in response to that reduction. However, it's not until the outflows exceed 19,000 cfs that the total diversions are increased above the 1500 cfs level.

And then as we transition into April-May, in this case, we are changing the way we're calculating the target, and we're now using the San Joaquin inflow-and-export ratio. This is essentially how we operated actually in 2016, so the results are very much similar.

So that -- that is an example of how the spring outflow target could have been implemented in 2016. And can we move on to the next slide.

I know we went through a bunch of stuff fairly quickly, but I think that the important thing to take aware from my testimony is that the California WaterFix proposes additional criteria. And as I -- as shown in my examples here, that criteria can be operationalized and implemented in real-time operations. And that concludes my summary testimony.

And now, I believe, I'll turn it over to Dr. Ohlendorf.

WITNESS OHLENDORF: Thank you, Mr. Miller.

And good morning, Hearing Officers.

I'll be briefly summarizing my testimony that describes the development and calibration of selenium bioaccumulation models that we used or developed for the evaluation in the Final EIR/EIS and the Biological Assessment for evaluating conditions under Alternative 4A Operational Scenario H3+ in comparison to existing conditions and the No Action Alternative.

MR. MIZELL: Excuse me, Mr. Ohlendorf, if I might interrupt you for a second.

Mr. Hunt, could we bring up DWR-1067, please.

Thank you.

WITNESS OHLENDORF: Thanks.

This modeling work that we did is one of many selenium-related projects that I've led since discovering the effects of selenium on birds at Kesterson Reservoir in the 1980s. And overall, selenium has been a large part of my work since Kesterson Reservoir. And overall, I've had over 45 years of evaluating effects of environmental contaminants on fish and wildlife, but selenium has been a large part of that over the recent years.

Could you bring up the next slide, please.

My presentation will begin with a short summary. I'll be describing reasons for having high credibility in the models. I'll talk some about selenium basics because selenium is quite different than most water quality constituents that are of concern. And I'll describe the Delta-wide model that we developed and calibrated for fish such as largemouth bass that eat other fish -- so that would be of those similar to striped bass or fish like that -- and the separate modeling that we did of the Western Delta focusing on sturgeon. And I'll describe the selenium model outputs and then summarize with some conclusions.

Next slide, please.

The calibrated models that we developed

covered the range of expected water concentrations of selenium in the Delta, including the higher concentrations from the San Joaquin River and lower from sources such as the Sacramento River.

And the calibrated models gave reasonable predictions of the concentrations of selenium that would be found in fish based on a concentration found in water.

I'll be talking about a couple of terms often throughout the presentation. One of these is enrichment functions. The EF, or enrichment function, describes uptake of selenium from water into the lowest level of the food chain, such as suspended particulates in the water column or algae that then are consumed by invertebrates. And from one level to the next in the food chain, we refer to as a trophic transfer factor that we'll be talking about shortly. But the higher enrichment factors that we found with lower waterborne selenium concentrations are consistent with what's in literature. And I'll be showing that.

Development of this model, including the site-specific enrichment factors, was essential toward modeling the potential future conditions in the Delta.

Next slide, please.

Couple of reasons we have high credibility in

the models or the models have high credibility, one is related to the modeling approach itself, and the other is the observational data that we had available for calibration.

Talking about the model itself, we followed the approach developed by Presser and Luoma, who are considered the authorities in the field of selenium bioaccumulation modeling. They have a series of publications that we relied on in the approach.

Again, the higher enrichment factors that we found in our modeling are consistent with expectations from literature. And the modeling approach that we used also was used in the subsequently promulgated "Water Quality Criteria for Selenium" by EPA.

We had largemouth bass data for three years from nine locations in the Delta. Those covered -- were collected in 2000, 2005, and 2007. And we had then a range of wetter years in 2000, 2005 and a dry year, 2007, that helped in calibration of the model.

Next slide, please.

And selenium basics, it's very important that we recognize that site-specific chemical, biological, and physical conditions determine how selenium bioaccumulates in the food chain. So we had the measured selenium concentrations in largemouth bass

provided by the Regional Water Board from 2000, 2005, and 2007. One of the notable facts was that the selenium concentrations in largemouth bass from the mouth of the Sacramento River were not significantly different from those near the mouth of the San Joaquin, even though the waterborne selenium concentrations from the Sacramento River is substantially lower than those from the San Joaquin.

And again these terms, "enrichment factor" or EF, going from water to particulates, rather than the trophic transfer factor, going from one level of the food chain to the next, are the ones that are most variable. The enrichment factors are much more variable than those going from one trophic level to the next.

Next slide, please.

This figure is from one of the chapters of a book that we produced on the -- we held a week-long workshop in Pensacola, Florida sponsored by the Environment- -- Society of Environmental Toxicology and Chemistry. We brought together 46 people from around the world who had expertise in selenium. These were representatives from government, academia, and industry, as well as NGOs and students. And the purpose was to develop a consensus of understanding of

how selenium behaves in the aquatic environment and the assessment of the effects of selenium on fish and wildlife.

So on the X-axis here, we're looking at -- not much of a cursor there, but I'm trying to point out that selenium concentration is increasing along the Y-axis here, on the left side. So selenium concen- -- oh, it disappears in the figure.

So on the Y-axis, selenium concentration is increasing. Across the lower axis, we have the different environmental compartments. The enrichment factor here, again, is the most highly variable factor in uptake of selenium, going from water to the food chain to the fish.

Going from water to the lowest level in the food chain, since it's algae, typically the magnification is orders of magnitude. So we're going from parts per billion to parts per million concentration. So typically hundreds or thousands-fold increase going from water to particulates or algae.

Once the selenium is in the food, like the algae, the transfer going from algae to invertebrates is much lower, typically less than a factor of 5. So the trophic transfer factor going from algae to invertebrates, again, typically less than 5, and even a

smaller factor going from invertebrates to fish.

Next slide, please.

So talking about the Delta-wide selenium bioaccumulation model, we considered five different models. We began by using some literature available, default enrichment factors and trophic transfer factors. And the second model, we used some Delta-specific enrichment factors and the literature-derived trophic transfer factors.

Both of those significantly underestimated the concentrations of selenium in the largemouth bass that we had from the nine locations where we could calibrate the model. So we looked at different approaches for deriving enrichment factors and calibrating the model that best fit the uptake from water to fish to the largemouth bass. And then using the fish data and the modeled water data and the trophic transfer factors -- the big variable, again, being the enrichment factor; we solved for that by back calculating -- and we derived enrichment factors that allowed us to calibrate the model.

These enrichment factors varied between wet -- wetter years, in 2005, where our enrichment factor median was a couple thousand, and then the dry year 2007, our median enrichment factor was three times

higher. So the uptake was much greater in 2007 than in 2000, 2005. And it also varied by location.

So the enrichment factor for the Sacramento River was 4,900 in comparison in comparison to 600 at the mouth of the San Joaquin. Again, the key point was that the largemouth bass data did not have significantly different concentrations of selenium at the mouth of the two rivers and the difference or explanation is that enrichment factor. And by solving for the enrichment factor, we were able to calibrate our models.

Next slide, please.

The figure shows the negative relationship between the enrichment factor -- or here it's called "Kd." The two terms are used interchangeably. On the left axis, we have the Kd going from 100 up to 10,000. And across the bottom, we have the water concentration from near the mouth of the Sacramento and similar sources to near 1 microgram per liter at the mouth of the San Joaquin.

So we see the significant negative relationship between the enrichment factor and the waterborne concentration. So this is using 88 data points that we had for location and sample-specific fish and water data. And it describes conditions when

we have all three years combined.

Next slide, please.

So we looked then at the wetter years, 2000, 2005, and we have this relationship here. Again, the same general trend but somewhat lower than the overall picture.

And next slide, please.

We'll see the enrichment factor is much higher. Then, again, that relates to the difference in selenium accumulation in the wet -- wetter years versus the dry year 2007.

Next slide, please.

For the Western Delta, we did separate modeling because there are different dietary exposures for the sturgeon than there were for the largemouth bass that we used in developing and calibrating the Delta-wide model.

So we looked at the two Western Delta locations, and here we were able to use literature-derived values that were recently provided by Presser and Luoma for sturgeon, specifically in the Carquinas-Suisun Bay area. So in our modeling, we used all of the input parameters there, the enrichment functions, the trophic transfer functions, and estimated uptake of selenium from water to the diet and

then to the sturgeon.

Next slide, please.

So in terms of outputs -- again, now we're talking here about the Delta-wide model. Outputs included estimation of first the selenium concentrations and particulates and algae that form the basis of the food chain, then from those particulates into invertebrates and from invertebrates into fish and also into bird eggs. We did that for both the insect-eating birds, such as waterfowl and shore birds, and for fish-eating birds.

Next slide.

Calibrated Models 3, 4, and 5, that I'll be showing shortly, gave reasonable predictions of the concentrations of selenium in whole body fish. And modeling of sturgeon, as I mentioned, was based on literature-derived values and did not require calibration.

Next slide.

So in this slide, we see the results of the five Delta-wide models. Again, the first two models on the left are well below our target. Here, we're looking -- I don't know if you can see the cursor, but there's a line here for 1. We're looking for a ratio of 1 of the predicted selenium concentration in fish

compared to the measured concentrations. We want a ratio of 1.

First two models substantially underestimated the selenium concentration, whereas Models 3, 4, and 5 gave reasonable predictions. Model 3, again, was for all three years of data. Model 4 was for the wetter years, 2000 and 2005. And Model 5, on the right, was the one for the dry year 2007.

Next slide.

So, conclusions: The calibrated models which covered the range of predicted selenium concentrations in water in the Delta under future conditions gave reasonable predictions of selenium concentrations in whole body fish.

And the higher enrichment factors that we calculated were consistent with what was -- what's been found in the literature and also as EPA found in the development of the water quality criteria for selenium in 2016. And developing these site-specific enrichment factors was critical to being able to model uptake of selenium from the water to fish under future conditions.

That concludes my summary. Thank you.

MR. MIZELL: So that wraps up the oral summaries for Panel 2 at this point. At this point,

the witnesses are available for cross-examination.

If it would be convenient for the Hearing Officers, we can bring different witnesses to the front or let them stay seated where they are.

CO-HEARING OFFICER DODUC: I think they may be seated. As long as they identify themselves for the court reporter, that would be appropriate.

We'll take a break at some point, but before we do, can I get a showing from the parties who wish to conduct cross-examination of this panel and an estimate of time? I believe Ms. Morris has already said she had just a very few questions, but I would like to hear from other parties as well.

Please, if you could, identify yourself by group number and a time estimate.

MR. O'HANLON: Good morning. Daniel O'Hanlon on behalf of the San Luis Delta-Mendota Water Authority, which is Group 4. My time estimate is 15 maybe 20 minutes.

MS. NIKKEL: Good morning, Meredith Nikkel on behalf of North Delta Water Agency, Group 9. I have approximately one hour.

MR. HERRICK: John Herrick, South Delta parties, 45 minutes to an hour, Group 21.

CO-HEARING OFFICER DODUC: Thank you.

MR. SALMON: Good morning. John Salmon on behalf of East Bay Municipal Utilities District, Fred Etheridge is here as well today. We estimate approximately two hours for this panel.

CO-HEARING OFFICER DODUC: Group number?

MR. SALMON: 15.

CO-HEARING OFFICER DODUC: Thank you.

MR. BEZERRA: Ryan Bezerra for Cities of Folsom and Roseville, Sacramento Suburban Water District, and San Juan Water District, Group 7. I'd estimate three to four hours.

CO-HEARING OFFICER DODUC: A reminder, Mr. Bezerra, since you're not used to going so far back in the order, that -- don't repeat.

MR. BEZERRA: I am quite aware of that.

CO-HEARING OFFICER DODUC: Thank you.

MR. BEZERRA: Thank you.

MR. JACKSON: Michael Jackson on behalf of Group 31. I'm going to be assisted in cross by Chris Shutes. Together, we assume it would be around three hours.

MS. TABER: Good morning, Kelley Taber on behalf of the Sacramento Regional County Sanitation District, Group 13, and City of Stockton, Group 22. I expect a total of ten minutes for both groups.

CO-HEARING OFFICER DODUC: Thank you Ms. Taber.

MS. WOMACK: Suzanne Womack, Clifton Court LP, Group 43. I expect at least an hour. Thank you.

MR. KELLER: Curtis Keller with Contra Costa County; we're in Group 25. Dan Wolk from Solano County is also here today. We have questions, probably 30 to 45 minutes.

If possible, we'd also request to switch our Group 25 with Group 19, which is Ms. Meserve's group, LAND.

CO-HEARING OFFICER DODUC: And coincidently, or not, she's next.

MS. MESERVE: Good morning, Osha Meserve for LAND and other parties. I estimate two hours of cross for this panel.

MS. DES JARDINS: Deirdre Des Jardins, Group 37, I estimate two hours.

And Tom Stokely, who's been designated a lay representative for PCFFA will have two hours for that group. I don't believe he's here today.

CO-HEARING OFFICER DODUC: Do you happen to know his group number?

MS. DES JARDINS: 38.

CO-HEARING OFFICER DODUC: Thank you. Okay.

MS. WEHR: Good morning, Ellen Wehr on behalf of Grassland Water District. We expect approximately 40 minutes for cross-exam.

CO-HEARING OFFICER DODUC: And your group number?

MS. WEHR: 44.

MR. OBEGI: Good morning, Doug Obegi, on behalf of NRDC, et al. With the Hearing Officer's indulgence, we would expect two to four hours, depending upon what questions have already been asked and how quickly we can move through the questions.

CO-HEARING OFFICER DODUC: Group number?

MR. OBEGI: 35.

MR. KEELING: Tom Keeling on behalf of the San Joaquin County Protestants, Group 24. We estimate about 20 minutes for this panel.

CO-HEARING OFFICER DODUC: And Ms. Nikkel is back.

MS. NIKKEL: Meredith Nikkel on behalf of the Sacramento Valley Group, part of Group 7. I also anticipate an additional hour for Group 7. And Andy Hitchings and I will be coordinating that part of the cross for Group 7, keeping in mind to be as efficient as possible.

CO-HEARING OFFICER DODUC: Thank you.

Group 2 you will -- Panel 2, you will be here quite a while, as you can tell from that.

Ms. Morris, can you conduct your cross-examination in ten minutes?

MS. MORRIS: I can.

CO-HEARING OFFICER DODUC: Let's do that, and then we'll take a break.

CROSS-EXAMINATION BY MS. MORRIS

MS. MORRIS: Good morning, Stefanie Morris for State Water Contractors. I just have a few questions for Ms. White.

Ms. White, your expertise in this hearing is in CVP SWP operations and modeling, correct?

CO-HEARING OFFICER DODUC: And this is Ms. White.

WITNESS WHITE: I haven't used this before, so.

CO-HEARING OFFICER DODUC: Ms. White, if you would like to stand up at the podium there.

WITNESS WHITE: We'll figure that out.

CO-HEARING OFFICER DODUC: Yes.

WITNESS WHITE: I'm sorry. Can you repeat that in the --

MS. MORRIS: Sure. Your expertise for this hearing is in CVP/SWP operations and modeling, correct?

WITNESS WHITE: That's correct.

MS. MORRIS: Do you have a degree in biology?

WITNESS WHITE: No, I do not.

MS. MORRIS: And have you ever worked for National Marine Fishery Services?

WITNESS WHITE: No, I have not.

MS. MORRIS: Have you ever worked for U.S. Fish and Wildlife Services?

WITNESS WHITE: No, I have not.

MS. MORRIS: Have you ever worked for the California Department of Fish and Wildlife?

WITNESS WHITE: No, I have not.

MS. MORRIS: Okay. I have no further questions. Thank you.

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

With that, we will then take our break, and we will return at 11:05.

(Recess taken)

CO-HEARING OFFICER DODUC: All right. Welcome back, everyone. We will now turn to Group No. 4, for your cross-examination. And if you could begin by identifying the issues that you will be exploring.

CROSS-EXAMINATION BY MR. O'HANLON

MR. O'HANLON: Thank you, Hearing Officer

Doduc. My name is Daniel O'Hanlon, appearing on behalf of the San Luis and Delta-Mendota Water Authority.

This morning I'll be asking questions of Dr. Greenwood regarding the scientific uncertainties underlying some of the operating criteria that are intended to protect fish and how that uncertainty supports the need for adaptive management.

Good morning, Dr. Greenwood.

WITNESS GREENWOOD: Good morning.

MR. O'HANLON: You have testified that, in your opinion, the proposed operating criteria of California WaterFix H3+ are reasonably protective of fish, correct?

WITNESS GREENWOOD: Yes, I have.

MR. O'HANLON: And your opinion is based at least in part on the fact that the operating criteria include implementation of requirements imposed under the 2008 and 2009 Biological Opinions regarding the effects of existing coordinated operations of the Central Valley Project and the State Water Project and the Delta smelt and various salmonid species, correct?

WITNESS GREENWOOD: That's correct.

MR. O'HANLON: And your opinion is also based on the requirements that will be implemented under the biological opinions recently issued for the California

WaterFix project, correct?

WITNESS GREENWOOD: Yes, that's correct.

MR. O'HANLON: And you also rely for your opinion on the terms of the Incidental Take Permit issued by the California Department of Fish and Wildlife for the WaterFix project, correct?

WITNESS GREENWOOD: That's correct.

MR. O'HANLON: Now, the criteria in the Biological Opinions and in the Incidental Take Permit are based on what the wildlife agencies believed would be protective for fish, correct?

WITNESS GREENWOOD: Yes, I believe so, yes.

MR. O'HANLON: So, as an example, the limits on negative OMR flows, which we've already heard a little bit about this morning, are intended to reduce the risk of entrainment at the project export pumps, correct?

WITNESS GREENWOOD: Yes.

MR. O'HANLON: But the scientific research regarding how to protect fish in the Delta and the factors affecting their abundance are still ongoing, correct?

WITNESS GREENWOOD: Yes, I'd agree with that.

MR. O'HANLON: And it's expected that the California WaterFix won't begin operations for at least

ten years, correct?

WITNESS GREENWOOD: I believe so, yes.

MR. O'HANLON: Now I'd like to ask you about some specific areas of uncertainty in the science underlying some of the recommended management measures for the protection of fish.

Could I please have Dr. Greenwood's written testimony, which is exhibit DWR-1012. And I would like to please turn to Page 23, Line 19.

Thank you. And I'm going to read the sentence that begins on Page 19 and goes on to Page 24, Line 2. "Low salinity zone habitat" -- I'm beginning the quote. "Low salinity zone habitat is believed to provide, along with other factors, suitable rearing conditions for early life stages; however, direct links between the extent of low salinity habitat" -- "low salinity zone habit," excuse me, "slash X2 at Delta smelt population responses are unclear, and this is an active area of research," closed quote.

First, what are the other factors needed for suitable rearing conditions for early life stages of Delta smelt?

WITNESS GREENWOOD: I'm sorry. Can we look at the whole sentence again?

MR. O'HANLON: Sure. In your testimony, you

indicate that low salinity zone habitat, along with other factors, provide suitable rearing conditions for early life stages. So my question is what other factors in addition to low salinity zone habit are needed for rearing conditions for Delta smelt?

WITNESS GREENWOOD: I can give a couple of examples. The reference here to low salinity zone habitat I think were, one, meaning there is the extent of the area of habitat that has low salinity, which for Delta smelt is represented by about 1 per 6 parts per thousand.

And the other factors would be factors within the low salinity zone such as relatively high turbidity, relative high food -- zooplankton in particular. So those are -- those are a couple of examples. The sources that I cite there, I think, have possibly some additional examples. But those are a couple of examples of those sorts of things.

MR. O'HANLON: Thank you. And what do you mean in your statement that direct links between the extent of low salinity zone habitat/X2 and Delta smelt population responses are unclear? What did you mean by that statement?

WITNESS GREENWOOD: Some analyses have shown -- I think some analyses also have shown potential

linkage and other analyses have not. And therefore, it's not completely clear that there's a linkage there between the extent of low salinity zone habitat and the population response.

MR. O'HANLON: And the fact that the linkage is unclear, is that a reason to build adaptive management into the California WaterFix project?

WITNESS GREENWOOD: Yes.

MR. O'HANLON: I'd like to turn to Page 25, please, of DWR Exhibit 1012, Lines 1 to 5. And I'll read that statement.

Quote, "There is a positive correlation between Longfin Smelt abundance (fall midwater trawl index) and average X2 from January through June. The Fall 2016 FEIR/S assumes that the neck NMFS underlying this correlation are related to spawning, egg incubation, and rearing habitat. The actual mechanisms underlying the observed correlation are uncertain," closed quote.

Could you please explain what you meant by this statement?

WITNESS GREENWOOD: Which particular statement? The whole what you just read or --

MR. O'HANLON: I'm sorry. That the actual mechanisms underlying the observed correlation are

uncertain.

WITNESS GREENWOOD: The fact that the mechanisms explaining this correlation are not known, they're uncertain, as the sentence says. I'm not sure what additional clarification you would want regarding that.

MR. O'HANLON: Well, what --

WITNESS GREENWOOD: Sorry. I don't believe that it's known what the mechanism underlying that correlation is. So I consider that to be uncertain.

MR. O'HANLON: So if I can perhaps restate it, there is this correlation between abundance and the average X2, but is it the case that why that exactly occurs is not known?

WITNESS GREENWOOD: Yes.

MR. O'HANLON: All right. And a little further down in your testimony, Lines 19 to 22, you -- you cite that uncertainty as a reason for addressing spring outflow through adaptive management, correct?

WITNESS GREENWOOD: Correct.

MR. O'HANLON: All right. I'd like to call up another exhibit. This one is State Water Resources Control Board Exhibit 50. All right. And this is a -- I'll read the title. "Flows and Fishes in the Sacramento-San Joaquin Delta, Research Needs in Support

of Adaptive Management."

Have you seen this report before?

WITNESS GREENWOOD: I believe I've seen it. I don't recall the specifics of the report.

MR. O'HANLON: Okay. Could we please have Page 3 of the report?

All right. Could you scroll up just a little bit. I want to see -- refer to a paragraph at the bottom of the page. Yes, that's great. Thanks.

There's a statement there, under the heading "Delta as an Evolving Place." I'll read it to you, and then I'm going to ask you a question about it.

"The Delta ecosystem has experienced considerable changes and is still evolving. The current Delta and its tributaries bear little resemblance to the predevelopment Delta in terms of its water flow regime, habitat structure, and fish communities."

And can I please have the top of Page 3 now.

"...and differ starkly from the conditions under which the Delta's native fish evolved. Non-native fishes now predominate, and the habitat and flow needs of the native species are difficult to define in the transformed place and in a novel ecosystem."

Do you agree with the statements in this paragraph?

WITNESS GREENWOOD: I would to have consider them more to really definitively give you an answer.

MR. O'HANLON: All right. That's fine.

How would the -- would you agree that changes have occurred in the Delta over time?

WITNESS GREENWOOD: That's my understanding, yes.

MR. O'HANLON: Okay. And how would the fact that the Delta is an evolving place and has changed over time, how would that complicated efforts to come up with managements measures protective of native fish?

WITNESS GREENWOOD: I would have to consider that in more detail. I can't really give you an answer at the moment.

MR. O'HANLON: The paragraph characterizes the Delta as a novel ecosystem. Do you agree with that characterization?

WITNESS GREENWOOD: I've heard that characterization. And I understand the basis for it, so possibly. I mean, yes, I could see how it could be described that way.

MR. O'HANLON: Is the Delta a combination of native and non-native species, currently, correct?

WITNESS GREENWOOD: Yes.

MR. O'HANLON: And do non-native species predominate in the Delta?

WITNESS GREENWOOD: To the best of my knowledge, yes.

MR. O'HANLON: Do you have an estimate as to the relative biomass of non-native versus native species in the Delta?

WITNESS GREENWOOD: I believe there are estimates. I don't have one at hand.

MR. O'HANLON: Something over 90 percent, does that sound familiar to you?

MR. MIZELL: Objection, calls for speculation.

CO-HEARING OFFICER DODUC: Sustained.

MR. O'HANLON: All right. How would the fact that the Delta has a combination now of native and non-native species, species that didn't co-evolve, how would that complicate efforts to develop management measures for the protection of fish?

WITNESS GREENWOOD: I would have to consider that more. I think there's a fair bit that could be spoken to regarding that topic, and I'm not sure I'm prepared to speculate on it this morning.

MR. O'HANLON: All right. Could I please have Page 6 of the report?

I'd like to again read you a statement. This one under the heading towards the bottom of the page. The heading is "Multiple Drivers Affect Fishes."

"Flow is but one factor affecting fishes, and its effects are confounded by other drivers of fish production in the ecosystem. Five major drivers are considered as drivers of change in any given ecosystem. These are habitat alteration and loss, resource use and exploitation, invasive species, pollution, and climate. All of these drivers have played a role in the Delta and affected fishes."

And do you agree with that statement?

WITNESS GREENWOOD: I think that's a reasonable summary, I guess. So I think that -- I think I would agree. But, again, I would have to think more on the specifics.

MR. O'HANLON: All right. Thank you.

Could I have Exhibit State Water Resources Control Board 54. And could I have the second page, please. The next page. Thank you.

This is a report titled, "A Scientific Assessment of Alternatives for Reducing Water Management Effects on Threatened and Endangered Fishes in California's Bay-Delta."

And this is a report prepared on behalf of the

National Academy of Sciences. Have you seen this report before?

WITNESS GREENWOOD: Yes.

MR. O'HANLON: And does this report analyze -- among other things, analyze the reasonable and prudent alternatives in the 2008 and 2009 Biological Opinions?

WITNESS GREENWOOD: I believe so, yeah.

MR. O'HANLON: Could I please have Page 51 of this exhibit. Thank you.

There's a paragraph that begins in the first full paragraph on that page I want to read to you, and I'm going to ask you a question about it.

"The biological benefits and the water requirements of this action" -- and "this action" has been referred to as limits on OMR flows for the protection of Delta smelt.

"...the water requirements of this action are likely to be sensitive to the precise values of trigger and threshold values. There clearly is a relationship between OMR flows and salvage rates, but the available data do not permit a confident identification of threshold values to use in the action. And they do not permit a confident assessment of the benefits to the population of the action. As a result, the implementation of this action needs to be accompanied

by careful monitoring, adaptive management, and additional analyses."

Now, as I understand it, they were saying here that there's a basis for limiting negative OMR flows t reduce entrainment risk, but exactly where to set the limits on OMR flows and how much benefit those limits provide the Delta population is not clear.

Is that how you understand their statement?

WITNESS GREENWOOD: Yes.

MR. O'HANLON: And do you agree with it?

WITNESS GREENWOOD: I would -- I would note that this report's from 2010. So at the time, that statement was reasonable. And I think in -- you know, in the interim years, there's been more learned on this issue. And so to some extent, I think that that statement still applies.

But there has been more knowledge gained on how to manage Old and Middle River flows as well as additional analyses related to what the population level effects are, for example, the Delta smelt life cycle model. So I think the time frame of the -- when the report was issued and where we are now is important to consider.

MR. O'HANLON: Thank you. Do you agree with the statement in that paragraph that implementation of

the OMR flow measure should be accompanied by adaptive management?

WITNESS GREENWOOD: Yes.

MR. O'HANLON: All right. There's one more exhibit I'd like to ask you about. And this is exhibit San Luis and Delta-Mendota Water Authority 20.

All right. This is a report entitled, "Effects of Water Project Operations on Juvenile Salmonid Migration and Survival in the South Delta, Volume 1 Findings and Recommendations." Have you seen this report before?

WITNESS GREENWOOD: Yes.

MR. O'HANLON: And are you generally familiar with its contents?

WITNESS GREENWOOD: I haven't read it completely. So I'm familiar with the general themes, yes.

MR. O'HANLON: Do you know what the collaborative adaptive management team is?

WITNESS GREENWOOD: Yes.

MR. O'HANLON: What is it?

WITNESS GREENWOOD: An adaptive management team, as I understand it, that is informing the adaptive management process for the implementation of the 2008, 2009 Biological Opinions and additional

considerations that I believe arose from various legal actions associated with that, with those biological opinions.

MR. O'HANLON: Okay. And is it your understanding that the salmon -- salmonid scoping team was tasked by the collaborative adaptive management team to look into the issues with the salmonids?

WITNESS GREENWOOD: I believe so, yes.

MR. O'HANLON: Could I please have Page ES-1 of this document?

All right. Dr. Greenwood, I'm going to be asking you about something called findings and gaps in the report, specifically, focusing on the gaps. And I directed you to this page so that we have a common understanding what those terms mean.

At the bottom of Page ES-1 it says, "Key Findings..." "Key findings were typically characterized as having a medium or high basis of knowledge and were judged by the SST," and that's the salmon scoping team, "as being critical to our understanding of salmon and steelhead survival in the Delta in the context of hydrodynamic conditions and export operations." So that's what they're meaning of "key findings."

Then they define key data gaps. "Key data

gaps reflect areas within the scope of the SST's review where the basis of knowledge was" --

Can I please have Page ES-2.

"-- typically low or minimal. The SST placed an emphasis on gaps that, if filled, would likely improve our understanding and inform our ability to more effectively manage water project operations and hydrodynamic conditions for improved salmonid survival."

And please scroll down a little bit further on Page ES-2.

So what is in this document in the Executive Summary is a table that has headings with a general topic and then a set of findings and gaps in information. And the first that I'd like to ask you about is on Page ES-6.

Could I have ES-6, please?

CO-HEARING OFFICER DODUC: Actually, this is your last line of questioning --

MR. O'HANLON: Yes.

CO-HEARING OFFICER DODUC: So about another five, ten minutes?

MR. O'HANLON: I would say five minutes, yes.

CO-HEARING OFFICER DODUC: All right.

MR. O'HANLON: Yes, and this is the last

document I'm going to be asking about.

So this is in the section of findings and gaps regarding project effects. And if you'll please scroll down a little further in the page.

I want to ask you about some of the gaps in information. The second bullet, and I'll just read the first sentence, says, "The evidence of relationship between exports and through-Delta survival is inconclusive. The key findings presented in this table are supported by medium or high basis of knowledge, but our basis of knowledge on the relationship between exports and through-Delta survival is low."

Do you agree with that statement?

WITNESS GREENWOOD: I would have to actually look at the -- the section that they're citing there to see where they're -- what they're basing that on.

MR. O'HANLON: Sure. And that's fair. And I have that, but I don't want to take the time today to go through that. Why don't we just go to the next page, Page ES-7, and specifically the third bullet.

"The contribution of water project operations to the total mortality of juvenile salmonids has not been quantified." Do you agree that statement?

WITNESS GREENWOOD: Is this specific to a particular -- particular area on -- how is "total

mortality" being defined? Total mortality of juvenile salmonids from the San Joaquin River basin? From the Sacramento River basin, other river basins?

MR. O'HANLON: I believe in this report, this is not tied to the specific geographic area in this section of the report.

WITNESS GREENWOOD: Then it's hard for me to say. I mean, there have been studies that looked at the informs of South Delta exports on mortality, for example, through the Delta, and these are the types of analysis that we included in an analysis of the WaterFix project. So I would say that there have been quantitative attempts.

But regarding the total mortality of juvenile salmonids, if that includes all potential mortality I'm not certain that there's been such an analysis.

MR. O'HANLON: All right. Could I please -- could you please scroll up the page just a little more down to the fifth -- I'm sorry. Go down. The fifth bullet. Thank you.

It reads, "It is unknown whether equivocal findings regarding the existence and nature of a relationship between exports and through-Delta survival is due to the lack of a relationship, the concurrent and confounding influence of other variables, or the

effect of low overall survival in recent years."

Do you agree with that statement?

WITNESS GREENWOOD: I mean, that statement is hard -- pulling out that bullet is hard to understand the full context around how that statement is being made. So I can't really say. I don't know which equivocal findings are being referred to specifically.

MR. O'HANLON: Okay. Why don't we turn to Page ES-9. And I'd like to ask you about the fifth bullet there.

And that one, "The magnitude of change in flow, water velocity, or water quality needed to elicit a behavioral or survival response by migrating juvenile salmonids has not been determined." Do you agree with that statement?

WITNESS GREENWOOD: I'm struggling a little with how -- what "behavioral survival response" is really meaning in this context. I've seen analyses that correlate through-Delta survival with flow, as one example. So I think it's a pretty broad statement without understanding the full context of what it's being made in.

MR. O'HANLON: Okay. Fair enough, Dr. Greenwood.

Would you agree that implementation of measures to protect salmons, juvenile salmonids in South Delta should be accompanied by adaptive management?

WITNESS GREENWOOD: Yes.

MR. O'HANLON: All right. I have no further questions. Thank you.

CO-HEARING OFFICER DODUC: Thank you.

Let me check and make sure. Groups 5 and 6, any cross-examination?

(No response)

CO-HEARING OFFICER DODUC: All right. Group 45 has switched places with Group 7. So does Group 45 have cross-examination?

(No response)

CO-HEARING OFFICER DODUC: Not seeing anyone here.

Group 8?

(No response)

CO-HEARING OFFICER DODUC: Group 9?

(No response)

CO-HEARING OFFICER DODUC: And what we'll do, Ms. Nikkel has estimated an hour. Assuming that she's close to that, we will take our lunch break when she's done.

MS. NIKKEL: Thank you. Meredith Nikkel, on behalf of North Delta Water Agency. I apologize to everyone for being between us and lunch.

CO-HEARING OFFICER DODUC: You'll just have to make it interesting.

MS. NIKKEL: I will strive to do so.

CO-HEARING OFFICER DODUC: And please begin by giving us an outline of the issues you will be covering and the witnesses you'll be cross-examining.

CROSS-EXAMINATION BY MS. NIKKEL

MS. NIKKEL: Okay. I have a few questions for Mr. Miller that pertain to the Incidental Take Permit and how the project will be operated pursuant to the terms of that permit. I think that's all basically one category.

And then I also have some questions for Ms. Smith. Categories there concern the 1981 contract with North Delta Water Agency, the modeling techniques, water quality results, as well as water level results. I'll start with my questions for Mr. Miller.

Mr. Miller, did you discuss your testimony with any of the witnesses that presented during Part 1 of this hearing?

WITNESS MILLER: What do you mean by that, by "discussing"?

MS. NIKKEL: Well, did you discuss the contents of your testimony, either your written testimony or your oral testimony, with any of the witnesses that presented during Part 1 of this hearing?

MR. MIZELL: Objection, the question is vague. Does Ms. Nikkel mean to also include witness who are both present in Part 1 and in Part 2 or simply those witnesses who are not before you in Part 2?

MS. NIKKEL: I mean, I'm referring to any witnesses presenting during Part 1.

WITNESS MILLER: Yes, I -- I've discussed it with my lead, John Leahigh.

MS. NIKKEL: Anybody else?

WITNESS MILLER: I'm trying to think of everyone who has looked at it. In terms of actually -- active discussions, that's probably the main one.

MS. NIKKEL: Is there anybody else you can think of as you sit here today?

WITNESS MILLER: I'm trying to remember if I discussed this with Mr. Reyes here, but I can't remember.

MS. NIKKEL: Okay. That's fair. When you spoke with Mr. Leahigh regarding your testimony, did you discuss with him whether any of the changes to the project that are described in your testimony would

change any of the testimony that Mr. Leahigh offered during Part 1?

WITNESS MILLER: What changes are you referring to?

MS. NIKKEL: Well, I'm talking generally about any of the changes that are reflected by the CWF H3+ scenario that's been presented in your testimony and the testimony of others during this part.

WITNESS MILLER: To the refinement of some of the criteria as part of H3+?

MS. NIKKEL: Any of the changes, yeah.

WITNESS MILLER: Yes, I discussed that with Mr. Leahigh.

MS. NIKKEL: And did he tell you whether or not the changes in the project would change his testimony?

WITNESS MILLER: I don't remember that ever coming up. But we did discuss that being within the range of his testimony.

MS. NIKKEL: And "the range of his testimony," you're referring to Boundary 1 and Boundary 2?

WITNESS MILLER: I think it would be the H3, H4 range.

MS. NIKKEL: Okay. But you never talked to him, or you don't recall whether he said that anything

would change in his testimony?

MR. MIZELL: Objection, asked and answered.

CO-HEARING OFFICER DODUC: Overruled for now. She's just reconfirming.

WITNESS MILLER: Yeah, he didn't mention that it would have -- that H3+ criteria would have changed his testimony.

MS. NIKKEL: All right. If we can pull up Mr. Miller's written testimony at DWR-1011 at Page 11, Line 22 to 23.

Mr. Miller, do you see at Line 22 where your written testimony reads, "The CWF H3+ target outflow for April and May is determined by using the criteria used today for the SJR IE"? Do you see that?

WITNESS MILLER: Yes, I do.

MS. NIKKEL: Are you familiar with the Incidental Take Permit that was issued for the California WaterFix project by the California Department of Fish and Wildlife?

WITNESS MILLER: Generally, yes.

MS. NIKKEL: Do you know if the criteria in that permit for April and May for spring outflow, is that the same or different than what was used here in your testimony?

WITNESS MILLER: So what was listed in the ITP

was different than what I have shown here. But this was an example -- an example of how it could have been implemented and consistent with our incidental Take Application.

MS. NIKKEL: So is it your -- is it your understanding that the California WaterFix project would be operated consistent with the San Joaquin IE or will it be operated according to the terms of the Incidental Take Permit?

WITNESS MILLER: It would be consistent with the terms of the Incidental Take Permit.

MS. NIKKEL: And those terms are different than the San Joaquin IE correct?

WITNESS MILLER: That's correct.

MS. NIKKEL: How are they different?

WITNESS MILLER: The April and May target outflow is based on a forecasted Eight River Index.

MS. NIKKEL: And that's in the Incidental Take Permit but not in the San Joaquin IE ratio criteria that was used here, correct?

WITNESS MILLER: The San Joaquin River IE is -- right -- it's how this example determined the April and May target.

MS. NIKKEL: And can you describe for us generally whether using the Eight River Index table

that you described was -- is included in the Incidental Take Permit, would that require higher levels of outflow than the San Joaquin IE ratio or lower?

WITNESS MILLER: In my example, it would be substantially the same.

MS. NIKKEL: What do you mean by "substantially the same"?

WITNESS MILLER: It would have resulted in substantially the same outflow.

MS. NIKKEL: So have you conducted an analysis of what -- and by "analysis" I mean a quantitative analysis -- of what the outflows would have been if operated using the table in the Incidental Take Permit?

WITNESS MILLER: I've looked at it, yes.

MS. NIKKEL: What kind of analysis did you conduct?

WITNESS MILLER: A similar one.

MS. NIKKEL: Similar to?

WITNESS MILLER: What I showed today.

MS. NIKKEL: And did you use a model for that?

WITNESS MILLER: This is not a model. It's a taking historical data and then applying that criteria and adjusting exports for that -- that criteria.

MS. NIKKEL: So you're saying you didn't use any model to analyze the Incidental Take Permit

criteria; instead, you did this different analysis, more of a conceptual analysis?

WITNESS MILLER: Right. Consistent with what I showed in my testimony today, presentation today.

MS. NIKKEL: And have you included in your testimony the results of the analysis of -- that you just described that you did with respect to the criteria in the Incidental Take Permit?

WITNESS MILLER: I didn't show that in my testimony.

MS. NIKKEL: If we can turn to page 10 of Mr. Miller's testimony, at Lines 26 to 28.

Here, Mr. Miller, you testify, "Based on the modeling analysis completed for the ITP application, the frequency of outflow exceedance was consistent with current conditions achieving the proposed spring outflow requirement."

Is the modeling analysis completed for the ITP application the same as the modeling that has been presented in Part 2 here today?

WITNESS MILLER: The modeling analysis that I'm referring here -- to here, is not the analysis that I -- that is part of my testimony. This modeling analysis was based on CalSim, developed for the Incidental Take Permit Application.

MS. NIKKEL: How is that analysis different?

WITNESS MILLER: The one I referred to here is CalSim. The one I did was basically just taking historical data and then modifying the exports for the criteria.

MS. NIKKEL: And I think I was asking a slightly different question. And it may be more appropriate for Mr. Reyes or others on the panel.

But my question is whether the modeling analysis described, that you identify here on Page 10, is that the same modeling analysis that's been submitted in this part as CWF H3+.

WITNESS MILLER: I'm sorry, yeah. That would have -- that's a more appropriate question for Mr. Reyes.

MS. NIKKEL: Okay.

WITNESS REYES: Mr. Reyes for DWR.

I'm not exactly familiar with what the model was used -- what model was used in the ITP application. So I don't know if that version is the exact same as the one that is being presented for this hearing process. So I don't know.

MS. NIKKEL: So does anybody on the panel know who conducted the modeling analysis that was used for the ITP application?

(No response)

WITNESS REYES: I believe DWR had consultants do that modeling that are not present here.

MS. NIKKEL: Okay.

Mr. Miller, do you know if there were changes in the project criteria between the time of the modeling analysis that was completed for the Incidental Take Permit application and the submittal of CWF H3+ as a modeling scenario for Part 2?

WITNESS MILLER: I'm sorry. Can you repeat that question, please?

MS. NIKKEL: Sure. I'm trying to understand what you know about the modeling analysis completed for the Incidental Take Permit application, which you have in your testimony, were there changes to the project criteria -- operating criteria between the time of the Incidental Take Permit application and the time when the CWF H3+ modeling scenario was submitted as evidence in this proceeding.

WITNESS MILLER: I'm not a hundred percent sure, but my understanding is that this -- the modeling for the Incidental Take Permit application would be consistent with the Final EIR/EIS, which I believe it was the California H3+. But I'd need to look to Erik to confirm that.

WITNESS GREENWOOD: If I could offer some --

MS. NIKKEL: Thank you.

WITNESS GREENWOOD: I was trying to rack my brains while you were asking.

So the ITP application, for the most part the analysis in the ITP application, as I mentioned here in my summary testimony, used the BA H3+ modeling scenario. But the one analysis that I showed for longfin smelt included the spring outflow criteria that Mr. Miller was describing, but it didn't include -- I believe it didn't include the Old and Middle River flow fall criteria. So it did include the spring, but it didn't include the fall.

And that was just used to demonstrate the potential differences, as far as the biological analysis, for the longfin smelt, January-to-June average X2 analysis, which I reference in my written testimony.

CO-HEARING OFFICER DODUC: Hold on a second.

Mr. Bezerra?

MR. BEZERRA: Yes. I'd like to move to strike Dr. Greenwood's answer. The entire witness panel just testified that no one on the panel knows anything about this modeling that's in this testimony. And then Mr. -- apologize if it's Mr. or Dr. Greenwood -- has

just summarized, via hearsay testimony outside the scope, I think, of his written testimony, what that modeling purports to show.

If there is no witness on this panel with sufficient knowledge of this testimony -- of this modeling to provide adequate testimony, they should not be attempting to testify about it.

CO-HEARING OFFICER DODUC: Mr. Mizell?

MR. MIZELL: This is a response in an indirect response to a question by Ms. Nikkel.

If she is inquiring to people's understanding about the modeling and Dr. Greenwood has an answer to that, I think it's appropriate for him to provide it for this hearing.

And I would also say that the scope of a witness's response to a question that goes beyond the scope of the direct testimony should not be limited by the scope of their direct testimony.

CO-HEARING OFFICER DODUC: Repeat that last one for me?

MR. MIZELL: If Ms. Nikkel is going to ask questions that go beyond the scope of my witness's direct testimony, they should be able to provide answers.

CO-HEARING OFFICER DODUC: She did not ask

Dr. Greenwood that question.

MR. MIZELL: And maybe I misunderstand the organization of the panel structure, but it was my understanding from Part 1 that questions to an individual are actually questions to the panel, and that's the reason why we have the panel set up. And thus Dr. Greenwood providing an answer is actually appropriate and helpful.

CO-HEARING OFFICER DODUC: Fair enough.

Mr. Bezerra?

MR. BEZERRA: I believe the Board's October 30th, 2015 notice of this hearing and various other places have a rule that says modeling must be presented with sufficient documentation for everyone to understand the modeling.

We just had the entire panel admit by their silence they do not know this modeling, they do not have knowledge of the modeling, they have not presented the ITP modeling in this hearing. So they should not be testifying about it.

CO-HEARING OFFICER DODUC: Mr. Jackson.

MR. JACKSON: This is probably something that will be coming up regularly.

The ITP decision was not made at the time that the testimony came in. So there is very little

opportunity for anyone to know what the differences are or for anyone to cross-examine about it. And frankly, I think the cross-examination demonstrates the problem of having the moving target.

I can understand why IT -- only the ITP application was considered in the testimony because that's all they had.

But we can't answer these questions from these witnesses. We would need the people who made the decision at Cal Fish and Wildlife to be present to cross-examine.

CO-HEARING OFFICER DODCU: So that was a support of Mr. Bezerra's objection?

MR. JACKSON: Yes.

CO-HEARING OFFICER DODUC: Thank you.

Ms. Morris.

MS. MORRIS: Stefanie Morris, State Water Contractors. I am not supporting Mr. Bezerra's statement. I wanted to clarify that Dr. Greenwood clearly said he was relying on modeling in his testimony and explaining his answer based on the modeling in his testimony.

Secondly, as evidenced by Mr. Jackson's last statement, it seems to be confusion based on ambiguity in the question about the modeling for the ITP that was

done by Department of Fish and Wildlife or the modeling for the BA that was submitted by the Department to Fish and Wildlife. And I think that that's creating a lot of confusion.

CO-HEARING OFFICER DODUC: Fair point, Ms. Morris.

We'll get back to that, Ms. Nikkel.

Ms. Des Jardins.

MS. DES JARDINS: I hearby join in the objections by Mr. Bezerra. And I wanted to further state that court decisions about evidence that's admitted under Evidence Code 801 and 802, particularly Sargon Pharmaceuticals versus University of California, require that complex scientific evidence such as this modeling establish sufficient foundation.

And if nobody on this panel has done the modeling or is a modeler with the expertise -- Dr. Greenwood does not have that expertise -- to testify, then the ITP modeling simply lacks foundation, and neither the testimony nor the exhibits that are based on it should be admitted. Thank you.

CO-HEARING OFFICER DODUC: Mr. Bezerra, you, who started all this.

MR. BEZERRA: Yes, sorry about that. Ms. Morris is correct. There is confusion here about

the modeling. Mr. Reyes has presented a great deal of modeling. However, as I understand it, it was ambiguity -- it was ambiguous to me in written testimony what Mr. Miller was talking about in terms of ITP modeling.

We have now confirmed that is something that Mr. Reyes has not presented. No one in this hearing has presented it. And on that basis, Ms. Des Jardins is absolutely right. There is no foundation for any discussion of this modeling in this hearing. And we should not have testimony that is supported by some kind of modeling that no one in this hearing is presenting or has seen or can be asked about.

CO-HEARING OFFICER DODUC: Mr. Miller?

WITNESS MILLER: Yes, ma'am.

CO-HEARING OFFICER DODUC: I'm looking at that sentence which has garnered a lot of attention. When you say, "Based on the modeling analysis completed for the ITP application," what specifically are you referring to? Where is it in the submittals from DWR for Part 2? And to what extent did you review that modeling for the purpose of your testimony?

WITNESS MILLER: So the -- and I think Mr. Reyes was correct in that this is the BA H3+, that ITP application modeling was the BA H3+ that he --

Mr. Reyes showed in -- Slide 7 of his PowerPoint.

CO-HEARING OFFICER DODUC: So you are referring to modeling conducted by the Department submitted to Fish and Wildlife?

WITNESS MILLER: Yes.

CO-HEARING OFFICER DODUC: And to what extent did you review that?

WITNESS MILLER: Very minorly [sic]. I saw the three-month average outflow to make this conclusion.

CO-HEARING OFFICER DODUC: But that modeling which was conducted by DWR has been submitted as part of Mr. Reyes' testimony, and Mr. Reyes is able to answer questions on it.

Mr. Reyes, I'm looking at you now.

WITNESS REYES: Yes. If it's BA H3+, then yes.

CO-HEARING OFFICER DODUC: And Mr. Miller has just confirmed that it was so. True?

WITNESS MILLER: Yes, I believe so.

CO-HEARING OFFICER DODUC: Do you know so?

MR. MIZELL: Hearing Officer Doduc, may I interject? It is submitted at DWR-1036.

CO-HEARING OFFICER DODUC: All right. On that basis, Mr. Bezerra, your objection is overruled.

Good luck, Ms. Nikkel.

MS. NIKKEL: I'm not sure I heard an answer from Miller on your -- on your last question, Hearing Officer Doduc.

CO-HEARING OFFICER DODUC: What is my last question, Ms. Nikkel?

MS. NIKKEL: I believe it was, "Are you sure that the" -- and I read this sentence to be modeling done in connection with the Incidental Take Permit application, not the permit, but the Department's application.

That modeling was the same as the BA H3+ modeling that has been presented by Mr. Reyes; is that correct?

WITNESS MILLER: I believe so. It is part of the record. I'm having trouble remembering exactly which one. But I'm pretty sure it is the BA H3+.

WITNESS GREENWOOD: Would I be able to provide some additional thoughts?

CO-HEARING OFFICER DODUC: Please.

WITNESS GREENWOOD: Could we scroll down? I'm just curious what the next sentence says on it, when it says, "This is further discussed in DWR-1016."

Would you be able to pull up my summary testimony? It's DWR-1029.

CO-HEARING OFFICER DODUC: This refers to Mr. Reyes' testimony. I think it's 1016.

WITNESS GREENWOOD: And then Slide 17, please.

This slide, which I discussed yesterday, illustrates modeling that includes the spring outflow criteria that Mr. Miller was summarizing an example for. And this was part of that. This table here is taken from the ITP application. We also have an Appendix 4-D, I believe, from the ITP application that discusses the difference between the BA H3+ and the, I must say, CWF H3+. It was the BA H3+ but including the longfin smelt spring outflow, which I called here on this table, PP (with longfin smelt spring outflow criteria)."

So this was, as I mentioned yesterday in my summary testimony, this was the only biological analysis that we had for this -- for this scenario, which is not -- CWF H3+ includes the spring outflow criteria from CWF H3+ [sic].

MS. NIKKEL: So, Dr. Greenwood, is the spring outflow criteria in the BA, CWF -- no. Is it just BA H3+? Is that what we're calling it? BA H3+ modeling the same or different from the spring outflow contained the CWF H3+ modeling?

WITNESS GREENWOOD: It's -- the CWF H3+

includes the additional March requirement; where as the BA H3+ includes the San Joaquin River I-to-E.

MS. NIKKEL: In March?

WITNESS GREENWOOD: Pretty sure -- no, April and May.

MS. NIKKEL: Thank you.

WITNESS GREENWOOD: To achieve similar overall March-to-May.

MS. NIKKEL: Okay. Thank you. I think I understand now that the BA H3+ modeling, which is the modeling analysis referred to in Mr. Miller's testimony as the ITP application modeling has different spring outflow criteria than CWF H3+.

Is that correct, Mr. Miller? Is that consistent with your understanding?

WITNESS MILLER: I think I would have to review quickly my notes.

WITNESS REYES: If I could answer?

MS. NIKKEL: Sure.

WITNESS REYES: So if I could have you pull up my testimony, DWR-1028, and go to Slide 7, please.

So this -- this simple chart was meant to point out the differences between the progression of the modeling. And so BA H3+, as you can see on the right, has updated spring outflow which, like

Dr. Greenwood confirmed, has the March piece added in there, and April-May with the San Joaquin IE.

CWF H3+ then further updated the spring outflow, largely in that April-May period is where some changes to the targets and maybe the off ramps were changed for CWF H3+ for the NOD.

But both the BA H3+ and WaterFix H3+ have a spring outflow criteria. And as -- if you scroll down to Slide 16. Here is where, you know, what I'm calling the DWR Epilogue, which is a document belonging -- I'll have to recite that back to you in a little bit when I can look it up.

But in that analysis, there's a -- they compared the BA H3+ to the WaterFix H3+ and found that the implications to water supply, surface water, water quality, and fisheries resources were found to remain similar to the FEIRS Alternative 4.

So even though there was a change in that spring outflow criteria, I think the implications for everything else was similar.

WITNESS GREENWOOD: I'd just like to clarify, if we can go back to the diagram that Mr. Reyes showed. The BA H3+ updated spring outflow criteria has the inclusion of the San Joaquin River I-to-E for April and May. The CWF H3+ adds in the March. So March, per the

table that Mr. Miller alluded to; April San Joaquin River I to E.

MS. NIKKEL: Mr. Reyes, I'd like to follow up with something I think I heard you say. In the changes in the spring outflow criteria between the BA H3+ scenario and the CWF H3+ scenario, were there changes to how the San Joaquin IE ratio was used in April and May?

WITNESS REYES: Yes, I believe -- if you go to Slide 14 on my presentation.

So this should explain what the changes are. It would be the last two columns, the differences there.

MS. NIKKEL: Okay. So is the only change in April and May to include a restriction or remove, I can't tell from the language there, remove the restriction to apply up to a minimum outflow target -- does that say "maximum"? Maximum outflow target of 44,500 cfs, or were there any other changes to April and May?

WITNESS REYES: I believe that's the only change.

MS. NIKKEL: Thank you. Okay. I'd like to go back to Mr. Miller. And if you'd like, we can pull it back up.

I'd like to look at the sentence again on Page 10 of Mr. Miller's testimony, which is DWR-1011. So after that discussion, is your opinion on Page 10 at Lines 26 to 28 based on the BA H3+ modeling or based on the CWF H3+ modeling?

WITNESS MILLER: So based on the table that Mr. Reyes just noted, it would have been the California WaterFix, CWF H3+.

MS. NIKKEL: But that's not the same as the modeling analysis completed for the ITP application, right?

WITNESS MILLER: That is my understanding. That was the -- the one done for the ITP application.

MS. NIKKEL: And yet your opinion is based on CWF H3+, a different modeling scenario.

MR. MIZELL: Objection, misstates the witness's testimony.

CO-HEARING OFFICER DODUC: Well, the witness has now clarified. He's confused me now.

WITNESS MILLER: So the ITP application, I'm fairly clear now based on that last table, that the ITP application did use the California WaterFix H3+ because they used the March outflow target and the April-May based on the San Joaquin I/E. And we're talking about the ITP application, correct?

CO-HEARING OFFICER DODUC: We're talking about whatever you put in your testimony.

WITNESS MILLER: Which is the ITP application, modeling for the ITP application.

CO-HEARING OFFICER DODUC: And you're now saying that it's the CWF H3+, not the BA H3+ that you've just said less than ten minutes ago?

WITNESS MILLER: Hopefully I caveated my certainty as being not very certain.

MR. MIZELL: If I may, Hearing Officer Doduc, Mr. Miller is being scrutinized as to the assumptions in a modeling run. He simply looked at the results when is doing his testimony, which is what his testimony says here.

CO-HEARING OFFICER DODUC: Yes. We're trying to ascertain which results he looked at.

MR. MIZELL: He reviewed the results listed in the ITP application. What was precisely in the ITP application results is a question that the modelers are very capable of answering as they just have. If there's any inconsistency, it's due to the fact Mr. Miller didn't look into the assumptions behind the results he was given. He reviewed the results, and applied those to his testimony.

CO-HEARING OFFICER DODUC: So, Mr. Reyes, help

me out. For the ITP application --

WITNESS REYES: Yes, so to me, this is where maybe there's some disconnect because I'm dealing with the BA H3+ and WaterFix H3+, and that's what I know and what I've put together in my testimony.

Now, some of these models have been used in the ITP application, I'm aware of. But I, myself, am not involved with the ITP application, so I don't know ultimately which one they end up going with.

So if Aaron's saying -- sorry. If Mr. Miller is saying that he looked at modeling to have a March outflow criteria, then that would point to the WaterFix H3+. And that's all I can say about that. I can't say whether it is or not.

CO-HEARING OFFICER DODUC: You're sure that what you looked at has the March requirements?

WITNESS MILLER: Yes, yes.

WITNESS GREENWOOD: Just to clarify again, there was -- there was this intermediate scenario, if you like, scenario between BA H3+ and the CWF H3+ which had the CWF H3+ spring criteria in it, as I showed in my table on my PowerPoint. It didn't have all the Old and Middle River flow criteria from CWF H3+.

So it has the spring -- the ITP application has a spring outflow criteria included also in CWF H3+.

CO-HEARING OFFICER DODUC: Perhaps, Ms. Nikkel, if you were to proceed with your line of questioning, we could further flesh this out. What was it that you were trying to get at by questioning Lines 26 and 27 and 28?

MS. NIKKEL: Really two things: One is the modeling analysis completed for the ITP application, and I'm not certain that I know the answer to that.

CO-HEARING OFFICER DODUC: I'm not certain that I know the answer to that.

MS. NIKKEL: And then, secondly, what was the basis for the opinion in the second part of the sentence, "...the frequency of outflow exceedance was consistent with current conditions achieving the proposed spring outflow requirement," and how does that relate to the spring outflow criteria that's contained the Incidental Take Permit.

And I don't know that I got the answer to either of those questions.

CO-HEARING OFFICER DODUC: I don't know that you did either.

Can anyone please help?

WITNESS GREENWOOD: I can try.

If we pull up, please, the ITP Application, Appendix 40.

MS. NIKKEL: I believe it's 107. Oh, no.

MR. MIZELL: DWR-1036 is the ITP application.

MS. NIKKEL: Oh, sorry.

WITNESS GREENWOOD: Appendix 4.D. 4.D, sorry, D for David.

As I mentioned, most of our analysis was based on the BA H3+ modeling scenario. During the development of the ITP application and in coordination with the Department of Fish and Wildlife, as I mentioned in my written testimony, the potential need for additional spring outflow was addressed. So this was outflow beyond just what was in the BA H3+ modeling scenario.

So this appendix, Appendix 4.D here illustrates -- and this was prepared by me because I was interested from a biological perspective what the difference were. And so -- we scroll down in the appendix, this shows --

If we go to the section that would be on Delta outflow, please.

This shows the differences between what's called PP here, which is the BA H3+ modeling scenario, and PPLFS is the intermediate scenario that includes the spring outflow criteria.

I think a little bit further down, and then

further down.

So I just give some examples. I give some examples here of the differences between these different scenarios in relation to the No Action Alternative. And the purpose of this was to illustrate, given that we have this -- given that, through the process of the ITP permit application this additional spring outflow criteria was included, what is the difference between these different scenarios.

And if we scroll down a bit further, we'll see Delta outflow.

So as I mentioned, this isn't CWF H3+, what's been labeled here as PPLFS. It's -- but it does include the spring outflow criteria from CWF H3+.

Referring back to the initial question which was to that sentence, I don't know which specific of these different scenarios is being referred to by Mr. Miller. But this is just to clarify that there was -- the spring outflow criteria as proposed under CWF H3+ was represented in the application.

WITNESS MILLER: So the analysis I was basing my opinion on was comparing that ITP application modeling to an existing condition modeling. And it looked at the exceedance of that three-month outflow, and that's going back to my testimony.

Can we pull that up?

And so that's where I determined that it was consistent with current conditions, based on that comparison.

MS. NIKKEL: So was it a comparison using the BA H3+ modeling, or was it a different scenario including this intermediary scenario that Dr. Greenwood has just described?

WITNESS MILLER: It's a -- what was used in the ITP application, which had a March-based outflow target, March based -- March outflow target based on an Eight River Index, looked at the Eight River Index, and then the April-May based on the San Joaquin inflow-to-export ratio.

MS. NIKKEL: Okay. So I think I understand that you don't recall the name of the scenario or which of the various scenarios that have been discussed here today, but your -- is that correct? You don't recall the name of the scenario?

WITNESS MILLER: I -- I keep going back and forth. I thought it was one, and now it's the other. But I don't remember the name of it, obviously.

MS. NIKKEL: Okay. But do you recall that this spring outflow criteria was based, for March, on the Eight River Index, and for April and May, based on

the San Joaquin IE?

WITNESS MILLER: Yes.

MS. NIKKEL: And do you recall if, in April and May, the scenario included the elimination of the requirement -- of the outflow requirement when outflows are greater than 44,500 cfs?

WITNESS MILLER: I don't remember that was part of the application.

MS. NIKKEL: Okay. I think we've exhausted that line of questions.

I can switch gears, and I have a few more questions for Mr. Miller.

So, Mr. Miller, you testified both in your oral summary of your testimony as well as your written testimony that DWR would not take any action other than reducing exports to the south of the Delta in order to chief the March through May spring outflow criteria; is that correct?

WITNESS MILLER: That's the -- that was what I -- the example I provided, yes.

MS. NIKKEL: And is it your testimony that DWR would not take any other action to meet the spring outflow criteria contained in the Incidental Take Permit other than reducing exports?

WITNESS MILLER: Well, DWR will follow

whatever state and federal law that there is.

MS. NIKKEL: So are you saying that it's possible that DWR might take other actions other than reducing exports?

WITNESS MILLER: We're going to follow whatever state and federal criteria we're required to.

MS. NIKKEL: So if one of the state criteria is the Incidental Take Permit spring outflow criteria, is it possible that DWR would take actions other than reducing exports to meet that criteria?

WITNESS MILLER: Are you talking about the actual ITP, Incidental Take Permit?

MS. NIKKEL: I am.

MR. MIZELL: Objection, if she's talking about the actual ITP permit, then she's misquoting the permit. So I'm going to assume that question is in the hypothetical, in which case, I don't have any problem with Mr. Miller answering it.

CO-HEARING OFFICER DODUC: Ms. Nikkel, do you wish to clarify your question?

MS. NIKKEL: No. I'm asking a question -- I'll try again. Maybe that will help.

Is it possible that DWR would take any action other than reducing exports in order to meet the spring outflow criteria contained in the Incidental Take

Permit?

WITNESS MILLER: My understanding of what the Incidental Take Permit requires is only export reductions.

MS. NIKKEL: Okay. So I think the answer is no. Is it -- let me try this. Is it possible that DWR would release water from upstream storage in order to meet the Incidental Take Permit spring outflow criteria?

MR. MIZELL: Objection, calls for speculation as to what the Department may or may not do in some future hypothetical she has not set before the question.

CO-HEARING OFFICER DODUC: Overruled.

WITNESS MILLER: Could you repeat that question?

MS. NIKKEL: Sure. Is it possible that DWR would release water from upstream storage in order to meet the spring outflow criteria contained in the Incidental Take Permit?

WITNESS MILLER: Not the way it's written today, the Incidental Take Permit.

MS. NIKKEL: Is there -- are you aware of any operating criteria for the California WaterFix project that would preclude DWR from releasing water from

upstream storage in order to meet the outflow criteria in the Incidental Take Permit?

WITNESS MILLER: I'm sorry. Can you repeat that one more time?

MS. NIKKEL: I'll try.

Actually, if you could read the question back, please?

(Record read)

WITNESS MILLER: I don't think there's any criteria that limits our upstream operations.

Is that -- is that the question?

MS. NIKKEL: Is that your understanding? So the answer's no?

MR. MIZELL: Objection, misstates the witness's testimony. I believe that was clearly he does not know. He answered her question with a question.

CO-HEARING OFFICER DODUC: Answer her question. Her question was a yes-or-no question. And your answer is? Are you aware of any operating criteria that would limit --

MS. NIKKEL: -- DWR's ability to release water from upstream storage in order to meet the spring outflow criteria in the Incidental Take Permit?

WITNESS MILLER: Yeah, I don't know.

MS. NIKKEL: So you're not aware of any?

WITNESS MILLER: I'm not aware of any.

MS. NIKKEL: Thank you. Are you aware of any analysis done by DWR or anybody else of what the effect would be if DWR were to release additional water from upstream storage in order to meet the Incidental Take Permit?

MR. MIZELL: Objection, calls for speculation.

MS. NIKKEL: Just what you're aware of.

CO-HEARING OFFICER DODUC: Just what he's aware of. Overruled.

WITNESS MILLER: Yeah, I'm not aware of any.

MS. NIKKEL: Mr. Miller, are you aware of whether or not Reclamation is named as a permitee on the Incidental Take Permit?

WITNESS MILLER: Actually, I don't know if they are a permitee or not, but maybe Ms. White --

MS. NIKKEL: Ms. White may know the answer?

WITNESS WHITE: I'm sorry, I don't. I haven't reviewed that in quite some time. I don't think so, but I'm not sure.

MS. NIKKEL: Let me try it this way. And this is a question for you, Ms. White.

Are you aware of any commitment that the Bureau of Reclamation has made to take in my action at

all to achieve the flows required by the Incidental Take Permit?

WITNESS WHITE: I think in general Reclamation tends to coordinate to meet all applicable state and federal regulations. But as far -- I have not seen a particular operating plan or commitment that water will be released from upstream CVP reservoirs to meet the requirements that are in the ITP.

MS. NIKKEL: And by saying the Bureau of Reclamation would coordinate, are you talking about the Coordinated Operations Agreement, or are you talking about something else?

WITNESS WHITE: I think it would go well beyond the Coordinated Operations Agreement. That would certainly be a part of it. But, basically, how we coordinate to meet any requirement and specif- -- I don't know if this is going in and out or not; it sounds like it is to me.

Typically, we have a set of actions. We coordinate on which those actions are, and then the accounting is done through the Coordinated Operations Agreement.

MS. NIKKEL: And isn't is true that the Coordinated Operations Agreement requires generally that obligations in the Delta, in delta outflow, be

shared between the Bureau of Reclamation and the Department of Water Resources?

WITNESS WHITE: Yes, that's correct.

MS. NIKKEL: So would the spring outflow criteria for the Incidental Take Permit also be shared under the Coordinated Operations Agreement?

WITNESS WHITE: I think that's something that we don't know the answer to yet. The Coordinated Operations Agreement also states that the agreement should be reviewed when there's major new infrastructure -- I don't remember the exact quote. So that's something that we'd need to discuss with DWR to determine how we're going to move forward on meeting all state and federal applications as it relates to this new piece of infrastructure.

MS. NIKKEL: I think that's all of the questions I had for Mr. Miller. That took a lot longer to get through than I anticipated.

CO-HEARING OFFICER DODUC: How extensive are your questions for Ms. Smith?

MS. NIKKEL: They're more.

CO-HEARING OFFICER DODUC: In that case, I suggest we take a lunch break, and we will return at 1:30.

(Whereupon, the luncheon recess was

taken at 12:25 p.m.)

AFTERNOON SESSION

(Whereupon, all parties having been duly noted for the record, the proceedings resume at 1:32 p.m.)

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CO-HEARING OFFICER DODUC: All right. Welcome back, everyone.

Ms. Nikkel, please continue.

CROSS-EXAMINATION BY MS. NIKKEL (resumed)

MS. NIKKEL: Thank you. Musical chairs, I will be addressing my questions for this portion to Ms. Smith, and I'll try to fit it within my original time estimate, but it might take, you know, a little bit longer.

Ms. Smith, did you discuss your testimony with any of the witnesses that presented during Part 1 of this proceeding?

WITNESS SMITH: Yes, I did.

MS. NIKKEL: Which witnesses?

WITNESS SMITH: Dr. Nader-Tehrani.

MS. NIKKEL: Anybody else?

WITNESS SMITH: Most of the people on this

panel that were presenting, we all shared our testimony, at least our presentation of it.

MS. NIKKEL: So this panel?

WITNESS SMITH: Yes.

MS. NIKKEL: Did you discuss your testimony with Maureen Sergent?

WITNESS SMITH: I did not discuss my testimony. I cannot remember if she was at the rehearsals when we were presenting our oral testimony, though. So I don't know if she saw it or not.

MS. NIKKEL: So did you ever have a conversation with her about whether or not the changes in the DSM-2 modeling results that are in your testimony would change any part of her testimony?

WITNESS SMITH: I did not.

MS. NIKKEL: Can I have DWR-306, please?

This is a document called, "Contract Between the State of California Department of Water Resources and the North Delta Water Agency for the Assurance of a Dependable Water Supply of Suitable Quality."

Are you familiar with this document?

WITNESS SMITH: Yes, I'm relatively familiar. I haven't read it for a while.

MS. NIKKEL: That's okay. Is it your general understanding that DWR is required to meet the

requirements of this contract in its operations of the State Water Project?

WITNESS SMITH: It's not within the area of my expertise. I know it's a contract, but I'm not sure of the legal constraints that we have.

MS. NIKKEL: And are you aware that this contract contains certain water quality criteria?

WITNESS SMITH: Yes, I am.

MS. NIKKEL: Is it your general understanding that those water quality criteria apply year round?

WITNESS SMITH: I'm trying to remember exactly what those criteria were. I'm not sure if they apply year round or not. But I do know there's various different criteria and throughout several months, so.

MS. NIKKEL: And are you aware that the criteria apply in September, October, and November?

WITNESS SMITH: I believe so, yes.

MS. NIKKEL: Thank you. So is it also your understanding that the water quality criteria of this contract, when they apply in September, October, and November, that is a period when there are no water quality requirements at Emmaton under D1641?

WITNESS SMITH: Yes, I believe so.

MS. NIKKEL: Did you conduct any analysis to determine whether or not DWR would be able to meet the

requirements, the water quality requirements of this contract under WaterFix operations described by CWF H3+?

WITNESS SMITH: I did review results for Emmaton, Three Mile Slough, Rio Vista, and -- what was the third one -- oh, and Emmaton. And then the other -- there were two or three other locations.

MS. NIKKEL: The locations that are identified by the contract?

WITNESS SMITH: Yes, that's correct.

MS. NIKKEL: Does any of the analysis that you just described for Three Mile Slough appear in the materials that you've submitted as part of this proceeding?

MS. SMITH: No, it has not.

MS. NIKKEL: Is there a particular reason why you didn't submit those materials?

WITNESS SMITH: Because I just recently reviewed them.

MS. NIKKEL: So "recently," within the last week, last two weeks?

WITNESS SMITH: Last week.

MS. NIKKEL: And based on that review, do you recall whether there were any significant differences between the results at Three Mile Slough and what's

been presented here?

WITNESS SMITH: Well, in what sense? That -- you know, the objectives are slightly different. Do you want to -- there's not a Three Mile Slough up here. Could you clarify that?

MS. NIKKEL: I'll try. What I'm interested in is whether or not, in your review of the Three Mile Slough results, whether there were significant difference in terms of the increases in EC that would occur under the CWF H3+ scenario over the No Action Alternative.

WITNESS SMITH: Yes, I noticed that there's a -- I will say a 5 percent increase in frequency of noncompliance over the No Action Alternative, approximately, give or take.

MS. NIKKEL: And how are you defining "noncompliance"?

WITNESS SMITH: You know, similar to those graphs that I showed previously, where you have the -- the noncompliance graphs, and you see where the -- you know, you take the -- the run minus the objective, and then you have the zero line. It's at that zero line where there's about a 5 percent difference.

MS. NIKKEL: And by "noncompliance" are you

talking about the water quality criteria in this contract?

WITNESS SMITH: Yes.

MS. NIKKEL: At Three Mile Slough?

WITNESS SMITH: Yes.

MS. NIKKEL: Was that 5 percent increase based on a long-term average?

WITNESS SMITH: It was -- it was based on the 16-year average, yes.

MS. NIKKEL: During Part 1 we heard Dr. Nader-Tehrani describe various modeling anomalies. Did the DSM-2 modeling that was conducted for CWF H3+ correct any of those anomalies?

WITNESS SMITH: No, not as relates to the North Delta.

MS. NIKKEL: Were modeling anomalies corrected for other aspects of the modeling?

WITNESS SMITH: I don't think so, but I'll ask Mr. Reyes if he's aware of anything.

WITNESS REYES: No, none that I can think of. I don't think we specifically tried to address modeling anomalies for Cal WaterFix specifically or for H3+ Cal WaterFix.

MS. NIKKEL: Did you address modeling anomalies for other projects or other aspects of the

modeling?

WITNESS REYES: I don't think so. We -- at least I don't -- to my knowledge, we haven't made any significant updates to the modeling logic.

MS. NIKKEL: But have there been nonsignificant updates?

WITNESS REYES: For instance, for the -- we have a model study that we released from my group. It's called the Delivery Capability Report. We updated certain contract entitlement numbers for the SWP. And this is for year 2017, some minor -- very minor updates to those numbers. But, no, not to any logic.

MS. NIKKEL: Would you characterize that as routine updates to the model?

WITNESS REYES: Yes.

MS. NIKKEL: Ms. Smith, is it your understanding that the DSM-2 modeling for CWF H3+ does not account for real-time operations that may be required to meet the water quality requirements of D1641?

WITNESS SMITH: Yes.

MS. NIKKEL: Is it also your understanding that the DSM-II modeling for CWF H3+ does not account for real-time operations that may be required to meet the water quality criteria in the 1981 contract that's

identified as Exhibit DWR-306?

WITNESS SMITH: Yes.

MS. NIKKEL: In the modeling analysis that you presented, I think we looked -- during your direct testimony we looked at analysis that was based on long-term averages over a 16-year period of record.

Did you do any modeling analysis on a shorter time scale -- time step?

WITNESS SMITH: In what sense? Can you clarify?

MS. NIKKEL: Sure. Let's talk about the -- your analysis of the project's ability to comply with the D1641 requirements at Emmaton. Did you analyze those results on a time step shorter than the 16-year period of record?

WITNESS SMITH: Well, within that period of record, we're looking at the 14-day running average, we're looking at monthly averages. In that sense, yes, we did look at that.

MS. NIKKEL: Okay. It may help pull that stuff up. Let's look at DWR-1015. This is your written testimony at Page 19.

Line 4, you state, "The monthly" -- excuse me, "The monthly average EC results for CWF H3+ during the months of October and November are similar to those

under the No Action Alternative with slight variations."

Can you explain what you mean by "slight variations"?

WITNESS SMITH: It's pretty qualitative. You know, if we could bring up a graphic on that, and then I could explain a little bit more.

MS. NIKKEL: Sure. Should we perhaps move to Page 21? I believe that's the graphic, Figure EC1.

WITNESS SMITH: So we're comparing the California WaterFix to the No Action Alternative. So your -- so the pattern is very similar, but the California WaterFix is higher than the No Action Alternative.

MS. NIKKEL: And so you said it's a qualitative analysis. Did you conduct any quantitative analysis to determine what the level of increases of EC would be?

WITNESS SMITH: No.

MS. NIKKEL: So your opinion that there would only be slight variations is based on a qualitative determination and not a quantitative threshold?

WITNESS SMITH: Yes, within that testimony, yes.

MS. NIKKEL: Can you describe for me the

what -- on your qualitative analysis, what you would consider to be a significant increase in EC?

WITNESS SMITH: I would -- I guess my -- if I saw that there were significant increases in noncompliance, that's where I would -- or if there was a difference between the compliance -- significant difference in the compliance, that's what I would consider a significant difference.

MS. NIKKEL: And I think I heard you testify earlier that, when you reviewed the modeling results at Three Mile Slough, you determined that a 5 percent increase in noncompliance in a 1981 contract was significant; is that correct?

WITNESS SMITH: I don't know if I said it was significant. I said there was a 5 percent difference.

MS. NIKKEL: Okay. Would you consider a 5 percent increase in noncompliance to be significant?

WITNESS SMITH: I don't know. I think it -- in the sense of is that a bigger deal and whether or not the Department will be able to achieve the compliance, I don't think it's significant, just based on what was presented by operations and by what Dr. Nader-Tehrani had put in his rebuttal.

MS. NIKKEL: So did you conduct any analysis to consider whether any real-time operations that the

Department might engaged in to reduce that 5 percent increase in noncompliance down to zero or something close to it, what the effect of that would be?

WITNESS SMITH: No, I have not done any analysis on that.

MS. NIKKEL: So look at this Figure EC1, this is the monthly average EC at Emmaton. It's shaded out in blue here, but let's look to the months of October and November.

It looks like, to me, that the pink bars are higher than the black bars, which would indicate that there's an increase in the CWF H3+ scenario in the monthly average EC at Emmaton over the No Action Alternative; is that correct?

WITNESS SMITH: Yes, that's correct.

MS. NIKKEL: And have you quantified how much that increase is?

WITNESS SMITH: No, I have not.

MS. NIKKEL: And are you aware that this level of increase would increase violations of the water quality criteria in the 1981 contract?

WITNESS SMITH: I saw that there was an increase in noncompliance through the analysis I did recently. I'm not -- because this shows the difference, I can speculate that that is a contributing

factor, but I haven't really connected it.

MS. NIKKEL: Okay. So when you looked at the Three Mile Slough results, you didn't do any analysis to see what the cause of that increase was?

WITNESS SMITH: Yeah, I didn't see -- I didn't look at the time periods when the exceedances were occurring.

MS. NIKKEL: And did you look at what the cause of those exceedances were?

WITNESS SMITH: No, I didn't. That would be -- that would be related to the time period when I'd see that.

MS. NIKKEL: Go to Page 14. I don't have a line number. I think it's down -- yeah, it's Lines 13 through 16, about. And this partial portion of your written testimony, you testify that, for Prisoner's Point, the NAA meets or is less than 0.44 mmhos per centimeter EC approximately 98 percent of the time. And then you go on to testify that, under CWF H3+, it meets that standard approximately 87 percent of the time.

So this is an increase in the violation of D1641 by 11 percent, correct?

MR. BERLINER: Objection, calls for legal conclusion, increase in violations.

MS. NIKKEL: I think we heard Ms. Smith testify in her direct testimony that the 0.44 millimeter standard is the objective in D1641; is that correct?

WITNESS SMITH: That's the objective -- I would say exceeds the objective.

MS. NIKKEL: By 11 percent of the time -- or 11 percent more of the time, correct?

WITNESS SMITH: Yeah, I've got to look at this again to do the calculations, so.

MS. NIKKEL: Comparing the numbers 98 percent and 87 percent?

WITNESS SMITH: Yes, okay.

MS. NIKKEL: And does it sound about right to you that that would be about 9 of the 82-year period of record in CalSim, correct?

WITNESS SMITH: 9, I wouldn't -- I couldn't say that that's how I would look at it.

MS. NIKKEL: Okay. We'll stick with the 11 percent. We don't need to do any other math.

Okay, can we have NDWA-400, please, and Page 7. Just for reference, I should have done this on the first page, Ms. Smith, this is a rough transcript of your direct testimony that you offered last week. If we could move down to the bottom of this page.

Here at Line 23 to 24, you describe this as a modeling anomaly or artifact.

And then let's go to Page 18. And sorry, I didn't write the line numbers down.

Okay. Sorry, Line 9. And here you say that Prisoner's Point is not one of the locations that has a flow salinity relationship simulated and therefore was not captured by the modeling.

Can you point to me where that is in your written testimony?

MS. SMITH: That's not within my written testimony. That was in Mr. Munevar's testimony in DWR-70 -- -71.

MS. NIKKEL: Okay. I'll go check that.

Let's look at Page 17. And here you say -- this is Lines 15 through 19. "The exceedance occurs primarily in dry years whether the San Joaquin River salinity is higher. And it is my opinion that the removal of water at the northern intake locations is not the reason for the higher salinity on Prisoner's Point."

Can you point that to me in your written testimony?

WITNESS SMITH: I don't believe that I said that in my written testimony.

MS. NIKKEL: Okay. I would, on that basis, move to strike that opinion at Lines 15 through 19 as improper surprise testimony.

CO-HEARING OFFICER DODUC: Mr. Mizell?

MR. MIZELL: I believe that Ms. Smith was explaining the modeling results at the time. I would have to go back and see if the results are self-evident and she was merely petting those results into English language instead of numeric language. But this is something I wouldn't be able to do here.

MS. NIKKEL: If I may respond? I read this as an additional opinion. If we'd like to compare the written testimony on the results at Prisoner's Point in her written testimony, you will see that there's a description of various operational criteria that are the basis of the opinions regarding Prisoner's Point.

And here, Ms. Smith is offering a new opinion, that it has to do with something other than operational criteria of the project, that was not contained in her written testimony.

CO-HEARING OFFICER DODUC: Mr. Mizell, do you still need time to review her testimony? She has just admitted that it's not in her written testimony.

MR. MIZELL: The witness can speak for herself, but I'm going to say, based on the first part

of that sentence where she's describing the year types in which it occurs, that it may have been a description of what was -- what she was observing in the modeling data.

But outside of additional time to review and find out the basis of this statement, I can't describe it now.

CO-HEARING OFFICER DODUC: Ms. Smith, what is the basis for the statement?

WITNESS SMITH: Well, because -- the basis of the statement is, because we saw what was going on in the San Joaquin River, that it was my opinion that the North Delta intakes weren't the reason. Specifically, I did not list that, the North Delta intakes, as part of my written testimony. But I did discuss the San Joaquin River salinity being higher and how the water -- or how the -- the other tributaries, rivers, sloughs fed into that area that include the Northern Delta.

So I didn't specifically say the North Delta intake location in my testimony. But did I talk about the impacts on the San Joaquin salinity. So there's kind of two points to that. I don't know if that made too much sense, but --

MR. MIZELL: If I may, her written testimony

on Page 14, Lines 19 through 21 indicate that she stated it was due to Southern Delta diversion export reductions and the closure of Head of Old River Gate. That would be something that would be operations other than the North Delta diversion points. So I think it's simply another way of stating what's in her written testimony.

CO-HEARING OFFICER DODUC: I see that now.

Do you see that, Ms. Nikkel?

MS. NIKKEL: I see that, but I think they are different, and perhaps I can ask a few further questions to understand.

CO-HEARING OFFICER DODUC: Proceed, otherwise your motion, objection is overruled.

MS. NIKKEL: I may renew it.

CO-HEARING OFFICER DODUC: For now, it's overruled.

MS. NIKKEL: Okay. So let's pull up the written testimony at Page 14. DWR-1015, at Page 14, Lines 19 through 26. And there, as Mr. Mizell just read, you describe various operational criteria. Are those operational criteria part of the California WaterFix project?

WITNESS SMITH: Let me look at 19 through what? What --

MS. NIKKEL: 23. Maybe all the way through 26, but --

WITNESS SMITH: Okay.

Okay. I read it. What was your question again?

MS. NIKKEL: Are those operational criteria that are part of the California WaterFix project?

WITNESS SMITH: Yes, those are part of the entire project.

MS. NIKKEL: And so wouldn't it be fair to say that those are causes -- that the causes of the effects that you're seeing here are caused by the project because they're part of the operating criteria?

MS. SMITH: I was just being more specific on to what the specific causes were so that we would understand better what is -- what is going on in the system. So if you're saying that the whole California WaterFix H3+ project as it was described, yes, the California WaterFix H3+ as described, yes, that is -- that is the difference.

If we're saying what parts of that project are, then I'm describing what the parts of the project are.

MS. NIKKEL: Okay, that's helpful. And so in your oral testimony, let's go back to your oral

testimony at Lines 15 through 19. And actually, specifically, when you talk about 17 through 19, you don't -- you're not basing -- strike that.

Your opinion is not that it's the -- that it's not caused by the project in any respect, it's just the aspect of the project involving diversions at the northern intake that are not causing the effect; is that right?

WITNESS SMITH: That's correct.

MS. NIKKEL: It's so limited. I withdraw my motion if it was still pending.

Can I ask you now about Lines 15 through 16, "The exceedance occurred primarily in dry years," is that in your written testimony?

WITNESS SMITH: No, that's just from my -- from looking at the data -- or I don't know. It may be in my written testimony, but it's from looking at the data.

MS. NIKKEL: Okay.

MS. SMITH: Yeah, it's hard to remember what I put in my written testimony, so.

CO-HEARING OFFICER DODUC: Time estimate, Ms. Nikkel?

MS. NIKKEL: A few minutes.

CO-HEARING OFFICER DODUC: Okay.

MS. NIKKEL: I'm going to move to the water level results at DWR-1015, which is Ms. Smith's written testimony, at Page 28, Lines 16 through 17.

And here you testify that the results for CWF H3+ are very similar to H3 and H4 with only slight variations.

Again, can you describe for me the threshold by which you determined that they were only slight variations?

WITNESS SMITH: Could we bring up one of the graphics?

MS. NIKKEL: Sure. Which one do you want to --

WITNESS SMITH: Just move down maybe the one that's closest to the intake. So just downstream of the intake, the probability of --

MS. NIKKEL: The Figure W1 on Page 30?

WITNESS SMITH: Yeah, the frequency plot. Maybe down a little more. There we go.

You can see a slight difference in the color, and that's what I say is a slight variation. They're basically kind of on top of each other. But there's -- you can see a little bit of purple on the blues and stuff.

MS. NIKKEL: And is that, again, based on a

qualitative analysis and not quantitative?

WITNESS SMITH: Yes, it's a qualitative analysis.

MS. NIKKEL: Thank you. I have nothing further.

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

Let me make sure -- Group 10, 11, 12?

(No response)

CO-HEARING OFFICER DODUC: Al right. Ms. Taber, you are up for Group 13 and 22, I believe. Right?

MS. TABER: Thank you.

CROSS-EXAMINATION BY MS. TABER

MS. TABER: Kelley Taber on behalf of Group 13, Sacramento Regional County Sanitation District and Group 22, the City of Stockton.

And I have about ten questions that go to -- will be addressed to Mr. Miller related to real-time operations.

Mr. Miller, you testified that real-time operations that would occur under the California WaterFix include interagency coordination, correct?

WITNESS MILLER: Yes, that's correct.

MS. NIKKEL: And that interagency coordination

does not include a process for coordinating with the Sacramento Regional County Sanitation District; is that correct?

WITNESS MILLER: No. There is some groups that do have other stakeholders that are welcome to join.

MS. TABER: And do any of those groups include the Sacramento County Regional Sanitation District?

WITNESS MILLER: Sacramento Regional is welcome to join, but I don't know if they're in that group or not.

MS. TABER: When you say "that group," did you have a particular group in mind?

WITNESS MILLER: It's called the DCT, Delta Conditions Team.

MS. TABER: And you don't know whether there's a process for them to join that group? Is it open to anyone?

WITNESS MILLER: It's pretty much open to anybody, yeah.

MS. TABER: Okay. And does that -- can you explain how membership in that group might influence real-time operations?

WITNESS MILLER: So the DCT provides stakeholders a place to speak their mind on various

different things. And so then the representatives from say, Fish and Wildlife Service -- that's the one? Okay -- and NMFS can listen to those opinions, and, you know, they can bring the data or whatever. And so then that -- through that forum, then Fish and Wildlife Service and NMFS are able to bring that to the Water Operations Management Team.

MS. TABER: So am I to understand that that particular stakeholder group exists for the purpose of informing the fisheries agencies, who would then bring concerns to the DWR operators?

WITNESS MILLER: DWR operators are on that team as well.

MS. TABER: Okay. And is participation in that group limited to operational issues that affect Fish and Wildlife?

WITNESS MILLER: I'm sorry. What?

MS. TABER: Is participation in that group or the subject of the stakeholder group or the subject of their discussions limited to issues that affect fish and wildlife?

WITNESS MILLER: Not necessarily, no.

MS. TABER: Okay. So are you aware that, for -- I'll just call them Regional San to save time here -- that for Regional San, one of the issues of

concern in this hearing is the effect of reverse flows at the point of discharge from the Sacramento Regional Wastewater Treatment Plant?

WITNESS MILLER: Yes.

MS. TABER: So would the DCT committee be the forum where an entity like Regional San would raise issues like that to the project operators issues, meaning reverse flow impact?

WITNESS MILLER: Are you talking about with the California WaterFix in place?

MS. TABER: With the California WaterFix in place, thank you.

WITNESS MILLER: That could be one of them, but then there's also an additional group that goes to the -- created specifically for operations of the California WaterFix facilities.

MS. TABER: Is that group described anywhere in DWR's testimony, to your knowledge?

WITNESS MILLER: I think it's described in the Final EIR/EIS.

MS. TABER: Okay. Do you have -- or does anyone on the panel know where that -- in the Final EIR/EIS that would be described? It's a big document, as you know.

WITNESS MILLER: I forget if I referenced it

or not.

Oh, yes. So thank you, Ms. White.

That would be SWRCB-102.

MS. TABER: But you don't -- you're not aware of anything -- a more specific reference within that?

WITNESS MILLER: Table 3-35, on Page 3-277.

MS. TABER: Great, thank you. I will look at that.

So would that DCT process or stakeholder group that you mentioned also be a forum for the City of Stockton to express input on the effect of WaterFix operations?

WITNESS MILLER: The DCT is something that we have today for today's operations.

MS. TABER: Is it your understanding that DCT would evolve to encompass WaterFix operations?

WITNESS MILLER: I would imagine DCT could evolve to encompass WaterFix operations.

MS. TABER: But to your knowledge, there's no other process or protocol that has been established as of today that would specifically provide for input from stakeholders such as Regional San or Stockton?

MR. MIZELL: Objection, asked and answered. He's explained that another group would be created once California WaterFix is up and operating.

CO-HEARING OFFICER DODUC: And where -- what further do you need?

MS. TABER: That's fine. If Mr. Mizell -- I wasn't sure that I understood that correctly, but based on Mr. Mizell's representation that that's the answer, I will stop with that.

CO-HEARING OFFICER DODUC: Not that Mr. Mizell is testifying, of course.

MS. TABER: No.

So you also mentioned, Mr. Miller, that you have tools that help inform real-time operations decisions, correct?

WITNESS MILLER: Yes.

MS. TABER: The California WaterFix as its currently proposed does not involve any process or protocol for evaluating whether project California WaterFix operations would cause reverse flows at the location of the Sacramento Regional Wastewater Treatment Plant, correct?

WITNESS MILLER: Are you asking whether modeling has been done to determine that?

MS. TABER: No. I'm asking whether you have any process or protocol for monitoring that when the project is operating.

WITNESS MILLER: We will have to put in

additional monitoring for the project's facilities. And that will certain help inform any potential.

MS. TABER: Is there a specific mitigation measure or operating condition that covers the monitoring of reverse flows in the area around the Sacramento Regional Wastewater Treatment Plant, to your knowledge?

WITNESS MILLER: Not -- I have no knowledge of that.

MS. TABER: And you mentioned the need to implement monitoring. Does the California WaterFix as currently proposed include any protocol that would include modifying operations at the North Delta diversions in response to those monitoring results?

WITNESS MILLER: Yeah, I think that would be kind of -- that would be part of some of the adaptive management in terms of monitoring for biological purposes. But maybe you're not talking about biological.

MS. TABER: Well, no. If you -- and you may not be familiar with Regional San's testimony, but they have operational concerns related to the effect of reverse flows. And I'm just trying to understand if they're -- within your testimony or understanding of how real-time operations work, if there would be -- if

there's currently any thought given to how to address reverse flow impacts at Regional San's intake -- or discharge, sorry.

WITNESS MILLER: I don't -- I'm not aware of anything being set up to reflect your question.

MS. TABER: Okay. And I guess as -- similarly, those tools that you mentioned to inform the real-time operations decisions do not include a process or procedure for collecting or evaluating water quality data at the City of Stockton's drinking water intake on the San Joaquin River, correct?

WITNESS MILLER: So the tools that I'm primarily talking about are, say, like, DSM-2. And so -- I hope I'm not speaking for Tara -- or Ms. Smith, that typically the more data we can use to feed that -- those models, the better they can perform.

MS. TABER: And do you -- are you aware of any protocol to collect or evaluate data at the City of Stockton's drinking water intake and shape California WaterFix operations in response to that data?

WITNESS MILLER: I'm not aware.

MS. TABER: Okay. Thank you.

Just two or three more questions. So, the combined -- and this goes to how you will operate in the face of uncertainty or change conditions.

As I understand it, the combined capacity of the two conveyance tunnels that will be constructed is 9,000 cubic feet per second, correct?

WITNESS MILLER: That's my understanding.

MS. TABER: And that is the California WaterFix H3+ capacity that's been modeled using the CalSim model, correct?

WITNESS MILLER: That's my understanding.

MS. TABER: Well, if there's a correction to that or clarification, I'd ask anyone else on the panel to jump in.

(No response)

MS. TABER: If there, Mr. Miller, is a problem with one of the tunnels or one of the tunnels is out of service, being repaired, and the WaterFix is operated with only one tunnel at any given time, then I assume that only 4500 cfs, or half of that 9,000 cfs capacity, would be able to be exported via that single tunnel; is that correct?

MR. MIZELL: Objection, this goes well beyond Mr. Miller's scope of knowledge. This is a question that should have asked of the engineers, since they're the witnesses we provided to discuss the construction details and the physical specifications of the facilities.

MS. TABER: Well, it does -- in my view, this goes directly to operations and how the operations are modified in response to changing conditions.

Mr. Miller has testified that he is -- or is here as the witness testifying about real-time operations. So if he is able to answer it, I would appreciate an answer.

CO-HEARING OFFICER DODUC: Overruled, Mr. Mizell.

Mr. Miller, to the extent that you have analyzed the scenario that Ms. Taber is describing, then please answer her question.

WITNESS MILLER: Okay. And I may have misspoke about the capacity of the particular tunnels, the capacity of the three intakes. So I don't know actually know the capacity of individual tunnels, and that would have been a question for Mr. Bednarski.

MS. TABER: So you don't know, as the person in charge, at least, of the State Water Project operations, how much water would be or could be diverted through one of the tunnels if something were to happen to -- and make the second tunnel unavailable for you?

WITNESS MILLER: I don't know the capacity of each individual tunnel.

MS. TABER: Okay. Then I have no further questions. Thank you.

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

No. 14?

(No response)

CO-HEARING OFFICER DODUC: All right, No. 15, East Bay MUD. We're up to you, Mr. Salmon. You have requested two hours. To the extent that your cross-examination is productive, we will proceed along that line. But please note that I do want to give the court reporter a break. What do you say, Debbie, in half an hour?

Okay. So find a good time between 2:45 and 3:00 o'clock for us to take a break, please.

CROSS-EXAMINATION BY MR. SALMON

MR. SALMON: Good afternoon, John Salmon for East Bay Municipal Utility District.

CO-HEARING OFFICER DODUC: You're not on.

MR. SALMON: Not on.

Good afternoon, John Salmon for East Bay Municipal Utility District, Group 15. I'm here with Fred Etheridge, also representing East Bay MUD. We have questions for four witness on this panel. I will be asking questions of Mr. Reyes and of Dr. Greenwood.

Mr. Etheridge is going to be asking questions of Mr. Miller and of Mr. Wilder.

And there may be a good time to break -- I mean, we can break any time. But after I finish up with Mr. Reyes, it might be a good time.

CO-HEARING OFFICER DODUC: Yes, that might be a good time. And I would suggest that, Mr. Miller, you come back up during the break so that you don't have to keep holding the hand-held microphone.

And would you quickly run through the topics you'll be exploring with each witness?

MR. SALMON: Sure, all up front. For Mr. Reyes, I'm going to ask him about OMR flows, CVP deliveries, and the effects analysis.

For Dr. Greenwood, I have questions about the reasonableness standard, the project impacts on in-migrating adult salmonids, and project impacts on out-migrating juvenile salmonids.

MR. ETHERIDGE: I'm Fred Etheridge for East Bay Utility District. And for Mr. Miller, I will have questions on real-time monitoring and the input of fisheries information to operators.

And for Mr. Wilder, I will have questions on the rivers he examined in his testimony and project impacts on waterways.

CO-HEARING OFFICER DODUC: Thank you.

MR. SALMON: Could we please display Exhibit DWR-1016, On Page 11. And let's start on Line 14.

Mr. Reyes, this is your testimony, correct?

WITNESS REYES: This is 1028? Is this Exhibit 1028?

MR. SALMON: This is Exhibit 1016.

WITNESS REYES: Oh, 1016, my testimony, yes.

MR. SALMON: And here, at Line 14, you've referred to Figures 29 through 36 as depicting the OMR compliance frequency. And this is just a housekeeping matter. Did you intend here to refer instead to Figures 27 through 34? I'm asking you because I'm going to ask questions about these --

WITNESS REYES: Sure. Can we pull up Exhibit 1069?

And if you could go to Figure 29 or whatever figure was referenced in the -- my testimony.

MR. SALMON: So you referenced 29 to 36. I just want to confirm that you meant 27 to 34.

WITNESS REYES: Yeah, if you go back to 27.

Yeah, I must have mixed those up. At one point in time, these were all in my testimony, and I -- I took them out to create a separate exhibit. So I think the numbering was off one --

MR. SALMON: Thank you. Appreciate the clarification.

This exhibit, DWR-1069, is part of your written testimony, correct?

WITNESS REYES: That's correct.

MR. SALMON: Does this exhibit describe the inputs and assumptions for the CWF H3+ modeling released on November 30th?

WITNESS REYES: Could you repeat that, please?

MR. SALMON: Yes. In this exhibit, do you have a table that describes the inputs and assumptions for the CWF H3+ modeling released last November?

WITNESS REYES: Not in this specific exhibit, no.

MR. MIZELL: I might interject, we can go to Page 1 of Exhibit DWR-1069, and there's a table of scenario inputs and assumptions.

MR. SALMON: That's the table I was referring to.

WITNESS REYES: Oh, sorry about that.

MR. SALMON: So that contains the inputs and assumptions for the CWF H3+ modeling?

WITNESS REYES: That's correct.

MR. SALMON: Okay. Can we take a look at Table 32 in this exhibit? I think it's Page 55.

And this is one of a series of figures, the ones we just identified that describe OMR compliance frequency.

Mr. Reyes, can you please explain what this figure demonstrates?

WITNESS REYES: This figure was intended to show compliance with an OMR standard. So essentially, if you were above that zero reference line, that means you were in compliance or doing better than the standard. If you were below, then you were not in compliance with the standard.

MR. SALMON: The horizontal axis, is that the exceedance probability?

WITNESS REYES: Yes, that's correct.

MR. SALMON: And what does the vertical axis represent?

WITNESS REYES: The vertical axis is the difference in the flow between the simulated flow and the standard flow.

MR. SALMON: And the OMR requirement, is that recommended by the horizontal red dashed line?

WITNESS REYES: Yes, yes.

MR. SALMON: Oh, go on.

WITNESS REYES: Yeah, it's the standard, but not that -- the standard's zero. It's -- if you

were -- if the difference between your simulated flow and your standard, which is what is being plotted, if that difference is zero, then you are exactly meeting the standard.

But the standard itself may fluctuate between minus 5,000 and minus 1,250 or something. I forget the exact numbers for the standards. So I'm not representing the actual flow standard here. It's whether we are complying with the flow standard.

MR. SALMON: If the pink line or the black line is exactly in contact with the standard, which is the horizontal red dotted line, does that mean at that point in time, the project is exactly meeting the OMR flow standard?

WITNESS REYES: That's correct.

MR. SALMON: Is it fair to say that the farther up the vertical axis those curves go -- and that is the farther away from the flow standard -- is it fair to say that the farther up you go, the less negative the flows are in the OMR?

WITNESS REYES: Yes, I would agree with that. And I think I know where you're going with this. So there's an issue that I have with these charts, and I didn't get to get them corrected before we came here. There's nothing really wrong were the information.

But what it is is the black line is a comparison of the simulated flow to the BiOps standard. The pink line is the difference between the simulated flow and the new increased standard. And that's a mistake on my part. I should have also compared that against the BiOps standard, and then you would have seen where the pink line would then be above the black line.

And I've already reapplied these, and I can confirm that that's what it is. At some point I'll try to reintroduce that information. Maybe on rebuttal. I don't know what the process is.

MR. SALMON: So as of this point, that information is not in your -- the testimony or exhibits that you've submitted?

WITNESS REYES: It's not, but I was trying to show that we are in compliance with the OMR with these charts. That was my objective. And I still say that's still true.

MR. SALMON: Okay. Can we look at the next slide.

So this is a very similar OMR compliance chart for the month of May, correct?

WITNESS REYES: Correct.

MR. SALMON: And we see the same trend here?

WITNESS REYES: Same thing, yes.

MR. SALMON: And the NAA is further up the vertical axis than the H3+ scenario in general?

WITNESS REYES: Yes.

MR. SALMON: And we saw the same thing on the April slide, correct?

WITNESS REYES: Right. So the first slide is all the months. So, yes, you can see the same thing.

MR. SALMON: Okay. So you mentioned that these two modeled scenarios, the NAA and H3+ are actually -- I believe you said that they are different flow standards, depending on which scenario you were modeling; is that correct?

WITNESS REYES: That's correct.

MR. SALMON: And did you say that the NAA was the OCAP BiOps OMR standard and the H3+ was something else?

WITNESS REYES: That's correct.

MR. SALMON: I'd like to ask a few questions, try to pin down which flow criteria was assumed in each of the -- or particularly the H3+ scenario and how it might be different or the same as the NAA.

So the table at the beginning of this exhibit, indicates that the NAA modeling used the OMR criteria from the 2008 and the 2009 BiOps; is that correct?

WITNESS REYES: That's correct.

MR. SALMON: And that same table -- perhaps we should look at it. It's the bottom of Page 4 and top of Page 5.

If it's possible to get them both on the screen, these two pages -- maybe that's not possible, but it breaks across.

So for the H3+ modeling, the CWF H3+ in particular, I believe what this shows, although it doesn't all appear on this page -- and please confirm that this is correct -- is the modeling applied for October and November the same as the NAA. So that is, the OCAP BiOps OMR flows. And for all other months, it applied the same as the H3?

WITNESS REYES: That's correct.

MR. SALMON: And that's what shows on the next page, that latter part; is that correct?

WITNESS REYES: Yes.

MR. SALMON: Okay. And then in turn, H3 is a setup where either of two sets of OMR criteria may have been applied by the model, either some new criteria that appear in Table 3 which we haven't looked at but it's a new set of criteria, or it could have at times applied the same OCAP BiOps OMR flow standards as appear in the NAA -- as were used in the NAA; is that

correct?

WITNESS REYES: That's correct.

MR. SALMON: Okay. So going back to that chart, we'll go back to Page 55 of the exhibit. This again is Figure 30- -- it's the OMR compliance for April, Figure 32.

So can I tell from looking at this chart on any particular point you might choose along this curve which OMR flow standard is being applied by the model for the CWF H3+ modeling run?

WITNESS REYES: No, you can't in this chart.

MR. SALMON: Is it possible that some of the data points plotted on that pink curve here representing H3+ could be the same standard as the NAA?

WITNESS REYES: Yes, it's possible.

MR. SALMON: Also, did the NAA scenario plotted on these curves assume that the OMR flow standards for the NAA are no more stringent than the existing standards from the OCAP BiOps?

WITNESS REYES: Could you repeat that question?

MR. SALMON: Yes, that is -- I think I've already asked it.

Is it possible that a new or more stringent OMR flow standard could be imposed in the future, even

if the WaterFix project is never built?

MR. MIZELL: Objection, calls for speculation and was already answered in Panel 1.

MR. SALMON: I'll withdraw the question.

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

MR. SALMON: I'll move on to my next topic. I'd like to ask Mr. Reyes some questions about the similarity among the results of different modeled scenarios, and particularly with respect to CVP deliveries. Can we display, please, Exhibit DWR-1016 Page 3, starting on Line 7 where Mr. Reyes lists his opinions.

Mr. Reyes, I've noticed that, when you list your opinions here, you used the word "similar" several times to characterize the differences between the NAA and H3+. Do you see that?

WITNESS REYES: Yes.

MR. SALMON: For example, on Line 25, you said quote, "Simulated long-term average delivers to CVP and SWP North of Delta and South of Delta water service contractors were similar or higher than NAA under CWF H3+ scenario."

Can you explain in this context what you meant by the word "similar"?

WITNESS REYES: Sure. Let me try to get to that chart.

Yeah, if we could pull up DWR Exhibit 1028 and go to Page 55.

So this is an example of SWP North of Delta deliveries, which would be what I call service contractor delivery. And when I mean "similar," they're very close. The NAA, if you look at the long-term average, is 1189. And CWF H3+ is at 1200. So it's an increase of 11,000 feet long-term. And for various water year types, you know, as I visually look at them, they're very close. And any total numbers are not far from the No Action. So that's why I said "similar" because they're not exact; they're not the same exact.

MR. SALMON: So sounds like that was a subjective interpretation on your part of the data?

WITNESS REYES: Yeah, visually looking at it, they look similar to me.

MR. SALMON: So you didn't apply any quantitative criteria?

WITNESS REYES: No.

MR. SALMON: By calling the water deliveries similar, did you mean to say they're not the same.

WITNESS REYES: They may be the same in some

instances, and I think they are. So, no, I did not mean that.

MR. SALMON: But in some instances, they are not?

WITNESS REYES: That's correct.

MR. SALMON: Okay. I'd like to focus on one example in particular. On Line 27 of your testimony, the page --- which page were we looking at -- Page 3.

Starting on line 27, you state that the H3+ scenario resulted in less than 3 percent reduction of the annual deliveries to the North of Delta CVP service contractors compared to the NAA.

In your opinion, are the deliveries still close enough to be similar, despite a cut of nearly 3 percent?

WITNESS REYES: Yeah, from my perspective. I mean, from a macro scale, it's similar. I mean, some criteria's within 5 percent. I don't know what the exact criteria of similar is, but that's --

MR. SALMON: But in your opinion, this qualifies as similar?

WITNESS REYES: It does, yeah.

MR. SALMON: Okay. There's a chart that depicts this particular result. It's in Exhibit DWR-1069 at Figure 49, which is on Page 72. This chart

shows average annual deliveries to North of Delta M&I CVP contractors, correct?

WITNESS REYES: That's correct.

MR. SALMON: The column labeled "BN," does that show deliveries in below normal water years?

WITNESS REYES: That's correct.

MR. SALMON: In below normal years, this chart shows deliveries would be reduced by an average of 5,000 acre-feet under the H3+ scenario compared with the No Action Alternative; is that correct?

WITNESS REYES: That's correct.

MR. SALMON: And all the acre foot numbers on this figure are averages of all output for the entire 82-year model run; is that correct?

WITNESS REYES: That's correct.

MR. SALMON: Could reductions in some individual water years be greater than the averages shown in this figure?

WITNESS REYES: In individual water -- yes.

MR. SALMON: Could we please see exhibit DWR-1068.

Thank you.

This exhibit is a full-page enlargement of Figure 2 that is also a part of your written testimony, correct?

WITNESS REYES: That's correct.

MR. SALMON: Can you briefly explain the purpose of this figure?

WITNESS REYES: At least as far as how I used it in my testimony, I was just trying to highlight the data flow and maybe the interconnectedness of the different models that were used in the effects analysis.

MR. SALMON: Can you describe what is in the upper left corner box?

WITNESS REYES: That upper left corner box is meant to represent the hydrology and system operations type of models, which is, in this case, CalSim II.

MR. SALMON: Does CalSim II feed output into the other models depicted on this figure?

WITNESS REYES: Yes, it does.

MR. SALMON: And the other boxes on this figure, do they generally represent other models that are utilized as part of the effects analysis?

WITNESS REYES: That's correct.

MR. SALMON: Has this analytical framework of utilizing all of these modules been consistently used as part of each CalSim II model study for this project?

WITNESS REYES: I believe so, as far as the different -- along the progression of the EIR.

MR. SALMON: Was the effects analysis done in connection with the modeling prepared for this hearing?

WITNESS REYES: That, I'll have to defer maybe to the folks that have done the effects analysis, the biologists.

MR. SALMON: The biologists? Is there anyone sitting on this panel who would be aware of that?

WITNESS GREENWOOD: Can you repeat the question, please?

MR. SALMON: My question is whether the effects analysis depicted in this figure on DWR-1068 was done in connection with the modeling prepared for this hearing?

WITNESS GREENWOOD: Which particular modeling are you referring to as far as preparing for this hearing.

MR. SALMON: It could be either the -- either/or the modeling prepared for Part 1 of the hearing or new modeling that has been prepared in connection with Part 2.

MR. MIZELL: Objection, vague and ambiguous. The Department presented -- it's very sensitive to the word PE.

The Department presented modeling both for the BA H3+ and the CWF H3+ we submit both of those modeling

runs both to the parties in the hearing as well as to the public at large.

So if Mr. Salmon could please specify, is he referring to an effects analysis done for one of those two modeling runs, Dr. Greenwood might be able to answer the question more readily.

CO-HEARING OFFICER DODUC: I think Mr. Salmon is trying to determine whether or not this framework was used in all the effect analyses that were conducted.

MR. SALMON: In all of the modeling that was conducted, yes. I'm of the understanding that this complete effects analysis was performed for modeling prepared in connection with the Biological Assessment; is that correct?

CO-HEARING OFFICER DODUC: That's what it says on the title.

MR. SALMON: Right. Now, my question is whether this same suite of effects analysis was performed in connection with the modeling performed for this hearing. And I don't think it's vague or ambiguous which modeling was prepared for this hearing.

MR. MIZELL: I'm going to reassert my objection. It's vague and ambiguous because we submitted two different modeling results for this

hearing. If Mr. Salmon is referring to CWF H3+, then he needs to state that. If he's referring to the BA H3+ he can state that as well.

MR. SALMON: Both.

CO-HEARING OFFICER DODUC: That was my understanding of his question, overruled.

WITNESS GREENWOOD: So yeah, as I indicated earlier, most of the biological analysis, which would include things like DPM, which is the Delta Passage Model, and ECMS that you see in this figure, were done for the BA H3+ modeling scenario. As I mentioned earlier, as far as the biological modeling, the ITP application included a modeling run that had the spring outflow criteria for CWF H3+ applied to one biological analysis, specifically the longfin smelt X2 abundance relationship. That's the extent of biological modeling.

MR. SALMON: Do I understand your response to mean that some or all of these affects analyses were not performed in connection with the CWF H3+ modeling?

WITNESS GREENWOOD: That's right. Not all of this -- not all of the biological models that you see in this figure were performed for CWF H3+.

MR. SALMON: Do you know why not?

WITNESS GREENWOOD: The analysis that we're

basing our opinions on, depending on the different topics that we're looking at, we've made a -- as I gave in my summary testimony yesterday, I gave an overview of why I thought that what we had, the BA H3+ was a reasonable representation for CWF H3+ technology, but there were differences. So the CWF H3+ biological modeling wasn't undertaken because our biological analysis had been completed for the Biological Assessment and for the ITP application.

MR. SALMON: The CWF H3+ modeling differs in some particular from the BA H3+ modeling, does it not?

WITNESS GREENWOOD: It does.

MR. SALMON: Is it possible that, had you performed the suite of effects analysis on the CWF H3+ modeling, that the results of that effects analysis would have been different?

WITNESS GREENWOOD: The results would be different certainly, but as I laid out yesterday in my introduction to my summary testimony, where I compared several of the important physical outputs from the CalSim modeling -- I compared the BA H3+ to the CWF H3+ -- it was my opinion that they were sufficiently similar to be able to draw conclusions. The results were different, yes, but in my opinion, they're sufficiently similar to draw conclusions and

base opinions.

MR. SALMON: But your opinion is not based on an effects analysis -- it's not based on performing an effects analysis, correct?

WITNESS GREENWOOD: That's correct. As I mentioned, the only biological analysis that I've conducted to this point for the CWF H3+ as represented in these documents is what I described, which was the one analysis contained in the ITP application.

MR. SALMON: I have in further questions for Mr. Reyes.

I do have questions for Dr. Greenwood. We could turn to those or we could --

CO-HEARING OFFICER DODUC: And how long do you estimate for the cross-examination of Mr. Greenwood -- sorry, Dr. Greenwood.

MR. SALMON: Maybe half an hour.

CO-HEARING OFFICER DODUC: Then we are definitely taking a break.

MR. SALMON: All right.

CO-HEARING OFFICER DODUC: We will resume at 3:00 o'clock.

(Recess taken)

CO-HEARING OFFICER DODUC: All right, everyone, please take a seat. Couple of housekeeping

items before we turn to Mr. Salmon with about another hour and a half or so. But in any case, Mr. Salmon and Mr. Etheridge will be our last cross-examination being conducted for today, and we will resume tomorrow. We'll be back downtown.

And tomorrow I -- we will begin with -- oh, by the way, I just got a late request, late but not untimely, from the San Joaquin Tributary Authority, Group No. 18 to conduct cross-examination. And they requested around 20 minutes or estimated around 20 minutes. So we'll begin tomorrow with Group 18.

Then Group 19 has switched with Group 25, so after Group 18, we'll have the County of Solano for roughly 30 to 45 minutes. After that, unless other people show up, we'll get to Mr. Herrick, Group 21, for 45 minutes to an hour, then Group 24 for about 20 minutes.

Group 25 who is now 19, Ms. Meserve, for LAND has requested around two hours. Mr. Jackson has requested around three hours.

I expect that's the most we will get to. But if, by some miracle we get through all of that, then we will get to NRDC with an estimated two to four hours. And we will be back in the Coastal Hearing Room tomorrow. Good?

And also, I need to get back to Ms. Des Jardins. We said earlier this morning that we would get back to her various outstanding motions and requests after lunch. We did discuss it during lunch, but we don't have a final response for you, but you should expect it later this week.

All right. Are there any other housekeeping items we need to discuss? Aside from the fact that by being here today, we all missed the hailstorm that is happening downtown.

All right. With that, I'll return it to you, Mr. Salmon.

MR. SALMON: Thank you. I have some questions for Dr. Greenwood now. If we could please display Exhibit DWR-1012, Dr. Greenwood's written testimony, I'd like to focus on Footnote 2, which is at the bottom of Page 3. Dr. Greenwood, do you recall this footnote in your testimony?

WITNESS GREENWOOD: Yes.

MR. SALMON: It discusses the standard by which you analyzed effects on fish species; is that correct?

WITNESS GREENWOOD: Yes.

MR. SALMON: And did you apply a standard of reasonableness?

WITNESS GREENWOOD: Yes, I believe I did.

MR. SALMON: Did you use a different standard of reasonableness for listed species as opposed to unlisted species?

WITNESS GREENWOOD: Essentially not. And I can expand on that if it would be useful.

MR. SALMON: Please do.

WITNESS GREENWOOD: As I noted yesterday in my summary testimony, my consideration for reasonableness was based on, for example, with the biological modeling, capturing existing regulations, existing requirements under the Endangered Species Act, as represented, for example, in the 2008, 2009 Biological Opinions, as well as the requirements of the Bay-Delta Water Quality Control Plan, D1641.

The standard I applied in forming my opinions is in relation to comparison with the No Action Alternative for those, essentially the No Action Alternative including all of those things I just mentioned.

So reasonableness would be the comparison of the WaterFix CWF H3+ to the No Action Alternative.

MR. SALMON: For listed species?

WITNESS GREENWOOD: This is actually for all different species.

MR. SALMON: Yeah, I understood. That was the first part of the question. I apologize.

When you were looking at listed species and analyzing the impacts of the project alternative to the No Action Alternative, were species that -- did you determine for the listed species that there was no unreasonable impact, in other words, that the project met the standard of reasonableness based on whether ESA requirements were met, pertinent biological opinions and other applicable requirements? And there I'm quoting from your footnote.

Well, let me rephrase that.

Were those requirements that you referred to there -- the BiOps, the ESA requirements and the other applicable requirements, including Fish and Game Code and Water Code -- were those the standard of reasonableness that you applied with respect to the listed species?

WITNESS GREENWOOD: Yes, and also unlisted species, as far as to the extent that, as I just mentioned, the No Action Alternative represented these different requirements, the comparison was to the No Action Alternative. So even for unlisted species, the results of the No Action Alternative would -- would consider or would reflect these different requirements.

So the examples that I showed yesterday for species that are not listed -- for example, striped bass, American shad, and others -- the modeling for those includes not only D1641 but it also includes the Biological Opinions as well. So ultimately, in forming my opinions, even for the unlisted species, this considers -- it considers all of the different things that were captured within the model.

MR. SALMON: So to the extent a species, even an unlisted species, was analyzed in a Biological Opinion, you -- that analysis in the BiOps informed your reasonableness analysis; is that correct?

WITNESS GREENWOOD: Which particular biological opinion are you referring to?

MR. SALMON: I'm not sure. You've referred to them generally. I'm trying to get a sense of how you're making your reasonableness determination. And right now, I'm asking about listed species in particular.

WITNESS GREENWOOD: I was just trying to indicate what the -- so the basis of comparison was the No Action Alternative. And the No Action Alternative includes, for example -- and I think this is where the Biological Opinion reference is what was confusing. I was meaning capturing the effects of the criteria that

are included in the 2008, 2009 Biological Opinions that are represented in the No Action Alternative but then form the basis for comparison of the CWF H3+.

MR. SALMON: For unlisted species, what else forms your definition of reasonableness? What did you look at for unlisted species to determine whether an effect on that species is reasonable or unreasonable?

WITNESS GREENWOOD: Primarily, I mean, it's primarily the same. It's comparison to the No Action Alternative.

MR. SALMON: Comparison in --

WITNESS GREENWOOD: Comparison of the -- comparison of CWF H3+ as it may have been represented, at least in my -- I'm forming my opinion, as I mentioned yesterday, based on different modeling.

So in the case of the EIR/EIS for the unlisted species I mentioned yesterday, I showed results for H3 and H4 that were sort of bracketing CWF H3+ and indicating I felt that those gave a representation for CWF H3+.

So, again, these unlisted species included consideration of the No Action Alternative as the basis for comparison, as the point of comparison from which to assess reasonableness for my opinion.

MR. SALMON: Right. And you've mentioned

there that you've compared the No Action Alternative to the project alternative, the CWF H3+, I presume, to determine whether there is an impact and what the extent of that impact is. Do I have it correct so far?

WITNESS GREENWOOD: Yes.

MR. SALMON: Okay. So what threshold did you use? Was this a quantitative analysis of the modeling results from each of those two scenarios to determine whether an impact is reasonable or unreasonable, or was it a non-quantitative judgment that you made?

WITNESS GREENWOOD: Well, the quantitative modeling that we have, of which I gave some examples yesterday, forms part of the consideration, part of the opinion. But then, in some cases, there are additional considerations as well regarding the extent to which the modeling, the quantitative modeling, can be used to form the full opinion regarding a potential effect.

MR. SALMON: Is there anywhere in your testimony or the exhibits where the standard of reasonableness that you applied is defined?

WITNESS GREENWOOD: I don't -- I don't necessarily think so, no.

MR. SALMON: Okay. So for each of the opinions in your testimony where you have concluded that there's no unreasonable impact, you did so by

comparing the No Action Alternative to the project alternative and making a determination that there is no -- that the impact is reasonable or not unreasonable?

WITNESS GREENWOOD: That there would be reasonable protection by CWF H3+.

MR. SALMON: But not based on any quantitative analysis that is -- or even quantitative standards that are part of your testimony?

WITNESS GREENWOOD: As I mentioned, it's the comparison to the No Action Alternative which is the basis for my assessment of reasonableness.

MR. SALMON: Okay. I'd like to ask you a few questions about in-migrating adult salmonids and the WaterFix impacts upon them.

When you prepared your testimony, did you examine Delta Cross Channel operations under California WaterFix project conditions?

WITNESS GREENWOOD: Yes.

MR. SALMON: Do you understand the BA H3+ modeling to indicate that the WaterFix project could result in increased DCC openings during the fall months?

WITNESS GREENWOOD: Yes, I understand that the modeling shows that.

MR. SALMON: Can you explain the term "strain," your understanding of that term as it relates to in-migrating Chinook salmon?

WITNESS GREENWOOD: Strain would be when in-migrating or upstream migrating adult Chinook salmon return to a water body that is not the one that they were born in.

MR. SALMON: Can the Delta Cross Channel operations, in your opinion, cause or attribute to strain of in-migrating adult salmonids?

WITNESS GREENWOOD: I've seen reference to the potential for that to be the case, yes.

MR. SALMON: Did you do an analysis of how Delta Cross Channel operations under WaterFix project conditions would affect the strain of in-migrating fall-run Chinook from the Mokelumne River?

WITNESS GREENWOOD: We do have consideration of that, yes.

MR. SALMON: Where is that analysis of Mokelumne River fall-run Chinook as it relates to Delta Cross Channel operations in your testimony?

WITNESS GREENWOOD: Actually, it's not in my test- -- I don't believe it's specifically in my testimony.

MR. SALMON: But you said you did give

consideration to that; is that what you said?

WITNESS GREENWOOD: My testimony doesn't explicitly consider Delta Cross Channel operational effects, but they are discussed in Appendix 5.E of the Biological Assessment.

MR. SALMON: Are you aware of whether that appendix discusses Mokelumne River salmon specifically as it relates to Delta Cross Channel operations?

WITNESS GREENWOOD: I believe it does, yes.

MR. SALMON: But you have not conducted any analysis in connection with your testimony or this hearing with respect to effects of Delta Cross Channel operations on Mokelumne River?

MR. MIZELL: Objection, compound. We can take it based upon testimony and evidence for this hearing.

MR. SALMON: Sure.

CO-HEARING OFFICER DODUC: Mr. Salmon?

MR. SALMON: Yes.

Have you conducted any analysis of WaterFix project -- have you conducted any analysis of the effects of Delta Cross Channel operations as they relate to the WaterFix project on Mokelumne River salmon?

MR. MIZELL: Objection, asked and answered. He indicated it's in Appendix 5.E.

MR. SALMON: I'm asking if the witness conducted any analysis.

CO-HEARING OFFICER DODUC: Please answer.

WITNESS GREENWOOD: Yes, Appendix 5.E.

MR. SALMON: That was you who conducted that analysis?

WITNESS GREENWOOD: Yes.

MR. SALMON: Do you have an opinion about how the WaterFix project may affect DCC operations as they relate to migrating Mokelumne River fish?

WITNESS GREENWOOD: My opinion, I think, would be informed by the analysis shown in Appendix 5.E, which we can -- if it's helpful, we could roll it up and look at it.

MR. SALMON: But it's not in your testimony, correct?

WITNESS GREENWOOD: It's not in my -- it's not specifically referenced in my written testimony, no.

MR. SALMON: Okay. I could move on.

If there was a -- if the a significant portion of Mokelumne River fall-run Chinook strayed into other systems, could that impact the production levels of the Mokelumne River fall-run Chinook fishery?

WITNESS GREENWOOD: Could you repeat the first part again?

MR. SALMON: If a significant portion of Mokelumne River fall-run Chinook strayed into other systems, in your opinion -- other rivers, in your opinion could that impact the production levels of the Mokelumne River fall-run Chinook fishery?

MR. MIZELL: Vague as to the meaning of "significant portion."

WITNESS GREENWOOD: How are you defining the "fishery" in this case?

MR. SALMON: The fishery that is fall-run Chinook salmon of Mokelumne River origin.

CO-HEARING OFFICER DODUC: Overruled, Mr. Mizell.

WITNESS GREENWOOD: In a hypothetical situation, that a large portion has strayed, then I assume it could affect the fishery although I'm still not exactly clear what's meant by "fishery."

MR. SALMON: Is there a certain level of increased stain that would exceed the standard of reasonableness?

WITNESS GREENWOOD: I would have to consider that -- I would have to consider that further. I don't know.

MR. SALMON: Is there some level of increase that is reasonable within the standard of

reasonableness?

WITNESS GREENWOOD: I'm not sure, I don't know.

MR. SALMON: Can we see Page 5 of this testimony, please, Line 27, right at the bottom.

Dr. Greenwood, here you stated that real-time management decisions based on fine-scale, temporal, and spacial monitoring of fish occurrence in the Delta will provide additional protection for fish species. Is that -- did I say that correctly?

WITNESS GREENWOOD: Yes.

MR. SALMON: Is it correct that you testified in your direct testimony that realtime management actions will be focused on listed species?

WITNESS GREENWOOD: They will.

MR. SALMON: The fall-run Chinook is not a listed species, correct?

WITNESS GREENWOOD: That's correct.

MR. SALMON: And you're aware that the Mokelumne River supports a fall-run Chinook fishery?

WITNESS GREENWOOD: Yes.

MR. SALMON: Are there any fine-scale, temporal, and spacial monitoring programs in existence today that could inform project operators about the presence of adult in-migrating fall-run Chinook salmon

near the Delta Cross Channel?

WITNESS GREENWOOD: Did you say -- sorry, upstream migrating?

MR. SALMON: Yes, adult in-migrating. I can repeat.

Are there any fine-scale, temporal, and spacial monitoring programs that exist today that could inform operators about the presence of in-migrating fall-run Chinook salmon within the area of the Delta Cross Channel?

WITNESS GREENWOOD: I'm not aware of any that currently exist.

MR. SALMON: I'd like to ask you some questions about juvenile salmonids, and particularly how WaterFix may affect survival of out-migrating juveniles in the interior Delta.

Can we please see Page 41 of Mr. Greenwood's testimony -- Dr. Greenwood's testimony, Lines 6 through 8.

This portion of your testimony states, "Overall, the CWF and NMFS BO indicated that the CWF potentially could reduce through-Delta survival, increase travel times, and increase entry into the Central Delta, where survival is lower."

Is that correct, what you stated?

WITNESS GREENWOOD: Yes, that's what it says.

MR. SALMON: Do you agree with these conclusions of the CWF and NMFS BO?

WITNESS GREENWOOD: Yes, I agree that CWF potentially could do those things.

MR. SALMON: On Page 43, starting at Line 10, you discuss a project environmental commitment at the Head of Old River Gate, which you state would be constructed with the intent of keeping out-migrating juvenile salmonids in the San Joaquin River, along with other goals; is that correct?

WITNESS GREENWOOD: Yes.

MR. SALMON: Would the Head of Old River Gate in any way help address the issue of fish entering the interior Delta from east side Delta tributaries, such as the Mokelumne River?

WITNESS GREENWOOD: It may have a small -- small effect on hydrodynamics. However, it's a very, very small effect. Well, it depends how far downstream from the gate. The effect would be potentially larger for these side tributaries that are farther upstream, but less of an effect downstream, towards, for example, where the Mokelumne River, Georgiana Slough meet the San Joaquin River.

MR. SALMON: So the Head of Old River Gate

would have, at most, a small effect, if any, on preventing Mokelumne River out-migrating salmonids from entering the interior Delta?

WITNESS GREENWOOD: A small effect, but one that we -- that was looked at in terms of the analysis that we included in the Biological Assessment.

MR. SALMON: Do you recall what that analysis concluded?

WITNESS GREENWOOD: Generally, that the -- the hydrodynamics in that area were -- for example, the Mokelumne River salmonids, juvenile salmonids migrating downstream, where those coming from the Mokelumne River would meet the San Joaquin River, that the velocity in that region would be generally slightly greater compared to the No Action Alternative as a result of the Head of the Old River Gate -- similar or greater velocity as a result of the Head of Old River Gate.

MR. SALMON: What effect would that change in velocity have on the amount of time that Mokelumne River juvenile salmon spend in the interior Delta?

WITNESS GREENWOOD: Potentially slightly reducing the amount of time spent in the interior Delta. Although, I don't believe that -- I didn't specifically look at the amount of time analysis, but just based on velocity.

MR. SALMON: So it's fair to say that the Head of Old River Gate, then, would not have a significant effect on travel time in the interior Delta Mokelumne River origin fish; is that correct?

WITNESS GREENWOOD: Based solely on the hydrodynamics, under the assumption that that provides some representation of fish movement, which I think that there is some uncertainty regarding how well, though it's just the velocity, how that compares to the actual movement rates of fish, given the fish do have different behaviors that they're capable of.

So the effect would be similar or potentially slightly greater travel time, based purely on the assessment of the hydrodynamics from the DSM-2 hydromodeling.

MR. SALMON: And you're aware of the environmental commitment proposal to construct a non-physical barrier on Georgiana Slough if the WaterFix project is constructed; is that right?

WITNESS GREENWOOD: Yeah, the non-physical barrier would be just at the entrance to Georgiana Slough from the Sacramento River.

MR. SALMON: Do you believe the non-physical barrier in Georgiana Slough will reduce the proportion of fish entering the interior Delta?

WITNESS GREENWOOD: Based on the pilot studies that have been undertaken in 2011 and 2012, it seems that there's good evidence that, yes, the non-physical barrier -- if a non-physical barrier implemented as was tested at the head of -- at Georgiana Slough here, as I mentioned -- it consisted of a non-physical barrier of that type, which is a bubble curtain, with acoustic deterrents, flashing strobe lights, that type of barrier reduced the entry into the interior Delta by 50 to 67 percent. So it suggests that it could be effective.

MR. SALMON: The non-physical barrier in that location would be intended primarily to protect out-migrating juveniles from the Sacramento River and its tributaries; is that correct?

WITNESS GREENWOOD: That's correct.

MR. SALMON: Does the Georgiana Slough non-physical barrier address the issue of fish entering the interior Delta from east side Delta tributaries, such as the Mokelumne River?

WITNESS GREENWOOD: No, it's primarily intended for fish, as you said, from the Sacramento River Basin, Sacramento River and its tributaries.

MR. SALMON: So are you aware of any other WaterFix project environmental commitments that are

directed towards reducing the proportion of Mokelumne-origin juvenile fish from entering the interior Delta?

WITNESS GREENWOOD: No, I don't believe that there are any other environmental commitments of that nature.

MR. SALMON: And any that are directed towards addressing travel time impacts on Mokelumne-origin juveniles as they transit the interior Delta?

WITNESS GREENWOOD: I'm not -- I'm not aware of any specific requirements of that nature, other than just generally that there is overlap. As I mentioned I think, in my written testimony, there's overlap of the -- the unlisted fall-run from Mokelumne River with the time period during which there is -- there are criteria applied for the listed salmonids from the -- well, for the listed salmonids.

MR. SALMON: Finally, I'd like to ask you about South Delta exports. Let's go to Page 34 at Lines 16 through 19.

Here you stated that, under the CWF H3+ project, there will be, quote, "less use of the South Delta export facilities," which you claim could potentially result in reduced entrainment risk; is that correct?

WITNESS GREENWOOD: Yes.

MR. SALMON: What is the basis of your opinion that there will be less use of the South Delta export facilities if the WaterFix project is constructed?

WITNESS GREENWOOD: Based on looking at the CalSim modeling results, for example.

MR. SALMON: So you relied exclusively on modeling results to determine there would be less use?

MR. MIZELL: Objection, misstates the witness's testimony.

MR. SALMON: Okay. I'll ask it differently.

Did you rely exclusively on modeling results to determine there would be less use of South Delta export facilities?

WITNESS GREENWOOD: That was the primary consideration.

MR. SALMON: Did you mean there will be less use of South Delta export facilities at a particular time of year, or did you mean overall on average throughout the year, or something else?

WITNESS GREENWOOD: It was specific to the different focal time periods for the species of interest.

So on the page that we're looking at, for example, there's an example of an analysis there of a

particular analytical method that formed the basis for the -- one of the bases for the opinion. And that method there is essentially applying the CalSim modeling for South Delta exports to the historical entities of fish that have been reserved in salvage entrainment monitoring to make an assessment.

MR. SALMON: And among those species that you considered, did you consider Central Valley steelhead?

WITNESS GREENWOOD: Yes, as one of the species.

MR. SALMON: And fall-run Chinook?

WITNESS GREENWOOD: Yes.

MR. SALMON: And those two species generally out-migrate in the spring months through the interior Delta; is that correct?

WITNESS GREENWOOD: That's -- at least for fall-run, I think with the steelhead there may be some late winter, maybe early spring.

MR. SALMON: But generally there's overlap in when those two species migrate, and it's late winter through spring; is that correct?

WITNESS GREENWOOD: Yes, I believe so.

MR. SALMON: Are you aware the Mokelumne River supports populations of both Central Valley steelhead and fall-run Chinook?

WITNESS GREENWOOD: Yes,

MR. SALMON: Would you expect out-migrating juvenile Mokolumne River CV steelhead and fall-run Chinook to be present in the interior Delta during April and May?

WITNESS GREENWOOD: Yes, I believe so, based on my understanding.

MR. SALMON: If South Delta exports increase under project conditions during the specific months of April and May, do you believe that increase would tend to adversely impact the survival rate of out-migrating Mokelumne River steelhead and fall-run Chinook?

MR. MIZELL: Objection, misstates evidence and assumes facts not in evidence. We're not discussing the existing facilities that are replacing the South Delta, and there's been no proposal to increase pumping from those facilities.

CO-HEARING OFFICER DODUC: Mr. Salmon?

MR. SALMON: I think it is relevant because it's a -- while it's a hypothetical, I'm asking him, if in fact there is an increase during those two months, which the witness said are months when these fish species are present near the pumps in the interior Delta, I'm asking him how would that affect the fish.

CO-HEARING OFFICER DODUC: Overruled.

WITNESS GREENWOOD: Can you -- just so I get it right, can you repeat the question?

MR. SALMON. If South Delta exports increase under project conditions during the specific months of April and May, do you believe that increase would tend to adversely impact the survival rate of out-migrating Mokelumne River steelhead and fall-run Chinook?

WITNESS GREENWOOD: I don't have an analysis for steelhead as far as a quantitative analysis. Our analysis for fall-run Chinook salmon in the BA from the Mokelumne River does have a relationship between -- albeit somewhat weak relationship -- between through-Delta survival and South Delta exports.

So if there were -- as far as how -- as far as the actual response, if there was such a change that you're asking about, I'm not sure. Our modeling analysis is based on there being a weak relationship. Whether or not that would be evident, in reality, I'm not certain.

MR. SALMON: A weak relationship between?

WITNESS GREENWOOD: South Delta exports and through-Delta survival.

MR. SALMON: What part of the modeling analysis are you referring to?

WITNESS GREENWOOD: Appendix 5.E.

MR. SALMON: In general, not just Mokelumne River, but in general --

WITNESS GREENWOOD: No, Mokelumne River.

MR. SALMON: Well, I'm asking a different question.

In general, do -- is the survival of steelhead and fall-run Chinook correlated with South Delta export rates in your opinion?

WITNESS GREENWOOD: I'm not recalling for steelhead. As far as general, meaning from any of the tributaries or -- you said "in general."

MR. SALMON: Yes.

WITNESS GREENWOOD: Are you meaning generally from any of the tributaries, including the San Joaquin River? Or --

MR. SALMON: How about east side tributaries?

THE COURT: I'm not -- our modeling did include an export survival relationship for Mokelumne River specifically, Mokelumne River fall-run Chinook salmon, which was actually based on the pathways taken by fish that were actually raised in the Sacramento River and then entered that pathway through the Mokelumne River.

So -- so we do have a relationship -- we do have an analysis that actually tested for the effect of

changes in South Delta exports on fish from the Mokelumne River specifically.

MR. SALMON: And did that analysis show an inverse correlation between increasing South Delta exports and the rate of survival? In other words, survival rates decrease when exports increase? Is that what it showed?

WITNESS GREENWOOD: That's what the -- I mean, that's the fundamental model relationship. Since South Delta exports were greater, then that would be shown with the caveat that the model actually -- and this is the Delta Passage model that I'm talking about.

But the model actually -- the study upon which it was based looked at the ratio -- so the output and the thing that was assessed was the ratio of survival in the main stem Sacramento River and the interior Delta.

And it's the ratio that's captured in the model. So the ratio of those survival is the thing that's captured in the model. And the Lower Sacramento -- and it depends on the survival -- it depends on the flow and part of the survival in the Lower Sacramento River as well. So it's sort of capturing the effects of two things at once, South Delta export changes as well Sacramento River flow

changes.

But it -- to the original question, I think, it, you know, it allows us to make an assessment of what the changes in South Delta exports would do to through-Delta survival.

MR. SALMON: Thank you. No further questions.

CO-HEARING OFFICER DODUC: Thank you.

MR. ETHERIDGE: Thank you. Good afternoon. For the record, my name is Fred Etheridge. I'm from the General Counsel's Office of the East Bay Municipal Utility District. I'll begin with some questions for Mr. Miller.

CROSS-EXAMINATION BY MR. ETHERIDGE

MR. ETHERIDGE: Mr. Miller, you are a State Water Project operator; is that correct?

WITNESS MILLER: That's correct.

MR. ETHERIDGE: Mr. Baker, if you could please display Mr. Miller's testimony. It's DWR-1011, Page 3, Line 7.

CO-HEARING OFFICER DODUC: For the record, I believe it is Ms. Gaylen who is doing the documents right now.

MR. ETHERIDGE: Apologize.

Is it your testimony that real-time operations are a key component of the proposed CWF H3+ proposed

operations?

WITNESS MILLER: Yes.

MR. ETHERIDGE: In your oral testimony this morning, you mentioned that actual real-time operations of the SWP and CVP are made by people, correct?

WITNESS MILLER: I'm not sure if I mentioned CVP.

MR. ETHERIDGE: For the State Water Project; is that correct?

WITNESS MILLER: Yes, that's right. I did say real people operate the State Water Project.

MR. ETHERIDGE: Right. And it is your testimony that real-time operation -- well, as opposed to being automated or computer driven, I believe your point this morning was that people make the final decisions in operations; is that correct?

WITNESS MILLER: That's correct.

MR. ETHERIDGE: And it is your testimony that real-time operation of the SWP and CVP respond to actual conditions, correct?

WITNESS MILLER: Yeah, and I can't really speak to the CVP.

MR. ETHERIDGE: Okay.

WITNESS MILLER: It would be Ms. White for CVP. SWP, yes.

MR. ETHERIDGE: Ms. White, is that true for the CVP as well?

WITNESS WHITE: I'm sorry. Can you repeat that question?

MR. ETHERIDGE: Sure. Is it your testimony that real-time operation of the CVP responds to actual conditions?

WITNESS WHITE: Yes.

MR. ETHERIDGE: So that -- and this is back to Mr. Miller.

So that operators make changes to SWP operations based on changing real world, real-time conditions; is that correct?

WITNESS MILLER: The operators aren't changing real world conditions.

MR. ETHERIDGE: But they're making -- in response to changing real world conditions, they're making decisions on operations; is that correct?

WITNESS MILLER: Operators are making decisions based on real world conditions.

MR. ETHERIDGE: Thank you. And is it your testimony that actual project operations may differ from the California WaterFix H3+ modeling; is that correct?

WITNESS MILLER: Not exactly. So the -- can

you ask that question again? I'm sorry.

MR. ETHERIDGE: Well, this morning in your testimony, after explaining that human beings made the final operating decisions, you also talked about the CWF H3+ modeling; is that correct?

WITNESS MILLER: Yes.

MR. ETHERIDGE: And that at times actual project operations may differ from those displayed in CWF H3+ modeling; is that correct?

WITNESS MILLER: Well, the modeling is simulating the actions of the operators. So -- but the operators are following the criteria laid out and so is the model. But the model is doing the simulating of what the operators decisions will be or would be.

MR. ETHERIDGE: But in the final real world operation of the State Water Project, might it differ from that in the future displayed in the CWF H3+ modeling?

WITNESS MILLER: I may not be understanding your difference. Can you repeat that one more time.

MR. ETHERIDGE: Well, in the modeling for CWF H3+, the modeling made certain assumptions; is that correct?

WITNESS MILLER: Yes.

MR. ETHERIDGE: Might it be possible that, for

actual real world state Water Project operations, that those operations would in some situations differ from the assumptions in the CWF H3+ modeling?

WITNESS MILLER: Oh, right, yes.

MR. ETHERIDGE: Okay. Thank you.

WITNESS MILLER: But it would -- should be within the bounds of what the model is trying to simulate.

MR. ETHERIDGE: Okay. I'm going to ask some questions also on Page 3 of your testimony, Lines 9 and 10.

Do SWP operators receive input from multi-agency groups to, quote, "inform and guide the operations for protection of listed fish species"?

WITNESS MILLER: Yes.

MR. ETHERIDGE: What about non-listed fish species?

WITNESS MILLER: I'm not sure. All the species that the -- that the DOSS looks at, the Delta Operations for Salmonid and Sturgeon.

MR. ETHERIDGE: So you're not sure whether the DOSS team looks at non-listed species?

WITNESS MILLER: That's correct.

MR. ETHERIDGE: Okay. Thank you.

If you could turn to Page 5 of Mr. Miller's

testimony on Lines 9 to 11. I'm going to read from this.

"There are several technical teams that gather information on operations and specific fish species and assess potential impacts and provide that assessment to regulatory agencies and the WOMT as a whole."

And the WOMT refers to the Water Operation Management Team; is that correct?

WITNESS MILLER: That's correct.

MR. ETHERIDGE: And in your references to the specific fish species in Lines 9 and 10 from that section that I just read, does that include Mokelumne River fall-run Chinook salmon?

WITNESS MILLER: I'm not sure exactly what fish -- all the fish species that the DOSS looks at.

MR. ETHERIDGE: Okay. Thank you.

Do you know if the DOSS team considers up-migrating fall-run Chinook salmon in regard to the Delta Cross Channel operations?

WITNESS MILLER: I am not aware of what -- if they look at that or not.

MR. ETHERIDGE: Thank you. Mr. Miller, as you earlier noted, your testimony discusses real-time operations and decision making; is that correct?

WITNESS MILLER: Yes.

MR. ETHERIDGE: Are you aware of any real-time SWP or CVP monitoring processes that are used to reduce impacts to salmon during the October-November period?

WITNESS MILLER: I am aware of the NMFS Biological Opinion that has some actions in October, November.

MR. ETHERIDGE: Excellent. You anticipated my next question. You mentioned in your testimony this morning the Knight's Landing Catch Index; is that correct?

WITNESS MILLER: Yes.

MR. ETHERIDGE: And that index is contained in the 2009 NMFS Biological Opinion?

WITNESS MILLER: I believe so.

MR. ETHERIDGE: Are you aware that that Biological Opinion includes action triggers to close the Delta Cross Channel if a specified trigger, such as the Knight's Landing Catch Index, succeeded?

WITNESS MILLER: Yes, I'm aware that there's some Knight's Landing Catch Index-based triggers for the Delta Cross Channel.

MR. ETHERIDGE: So would it be fair to say there's two parts to that? First there's some monitoring that occurs, that being the Knight's Landing Catch Index; is that correct?

WITNESS MILLER: That sounds correct. I may have to look to some of the biologists; they are more familiar with that.

MR. ETHERIDGE: Certainly, certainly.

WITNESS MILLER: Dr. Greenwood?

WITNESS GREENWOOD: Sorry. Can you repeat the question?

MR. ETHERIDGE: Well, we're speaking of the Knight's Landing Catch Index in the NMFS 2009 Biological Opinion. Are you familiar with that?

WITNESS GREENWOOD: I'm familiar, yes.

MR. ETHERIDGE: So in that same Biological Opinion, it includes a trigger requiring the closure of the Delta Cross Channel if the Knight's Landing Catch Index exceeds a certain amount; is that correct?

WITNESS GREENWOOD: I believe so, but I don't recall the specifics.

MR. ETHERIDGE: Okay. So it would be fair to summarize that that existing regulatory process contains three steps: first, monitoring; second, a trigger; and third, a responsive corrective action if a trigger is exceeded? Is that correct?

WITNESS GREENWOOD: Is the question to me?

MR. ETHERIDGE: Well, whoever can answer it.

WITNESS GREENWOOD: That sounds correct.

MR. ETHERIDGE: Okay. Thank you. Do you know if these processes that we've just described are from the 2009 Biological Opinion focused on preventing juvenile Sacramento River run salmon from entering into the Central Delta?

WITNESS GREENWOOD: I think the Sacramento River Basin, so including Sacramento River as well as its tributaries.

MR. ETHERIDGE: Okay. Thank you.

Are you aware of any existing real-time SWP or CVP monitoring and operating processes that could be used to reduce impacts from strain of up-migrating adult Mokelumne River Chinook salmon through the Delta Cross Channel?

WITNESS GREENWOOD: I'm not -- I'm not specifically aware of it. Sounds like a very similar question to the one I answered earlier.

MR. ETHERIDGE: Well, we've just spoken of the existing standard regarding the NMFS 2009 Biological Opinion regarding the Knight's Landing Catch Index, correct?

WITNESS GREENWOOD: Yes.

MR. ETHERIDGE: And that, as you mentioned a couple of minutes ago, was designed to protect Sacramento Basin out-migrating juvenile salmonids; is

that correct?

WITNESS GREENWOOD: Yes.

MR. ETHERIDGE: So what I'm asking here is if there's any parallel existing monitoring and operating processes that could be used -- that is used to limit strain of up-migrating Mokelumne River Chinook salmon through the Delta Cross Channel.

WITNESS GREENWOOD: I'm not aware of any.

MR. ETHERIDGE: Okay. Thank you. Do you know if, under the California WaterFix project, will there be any real-time State Water Project or CVP monitoring and operating processes that could be used to reduce strain of up-migrating adult fall-run Mokelumne River Chinook salmon through the Delta Cross Channel?

WITNESS GREENWOOD: Meaning biological monitoring or --

MR. ETHERIDGE: Well, you've spoken earlier about the existing Knight's Landing Catch Index and the 2009 Biological Opinion, correct?

WITNESS GREENWOOD: Yes, for downstream migrating.

MR. ETHERIDGE: So I'm referring now to a different species. Whether under the WaterFix project, is it proposed there be any real-time State Water Project or CVP monitoring and operating processes that

could be used to reduce strain of up-migrating adult fall-run Mokelumne River Chinook salmon through the Delta Cross Channel?

WITNESS GREENWOOD: Nothing has been proposed to specifically address that potential impact.

MR. ETHERIDGE: Okay. Thank you.

I next have some questions for Mr. Wilder.

CO-HEARING OFFICER DODUC: Let me check in with the court reporter. Are you okay?

THE REPORTER: I'm okay.

CO-HEARING OFFICER DODUC: All right.

MR. ETHERIDGE: Mr. Wilder's testimony is DWR Exhibit 1013 signed. I know there are different versions of it, but it's the 1013 signed.

Mr. Wilder, your testimony refers to the Sacramento, Feather, and American Rivers; is that correct?

WITNESS WILDER: Primarily, although I also report on the Trinity and Clear Creek extension.

MR. ETHERIDGE: Okay. Thank you. Are those the rivers your testimony analyzes?

WITNESS WILDER: Yes.

MR. ETHERIDGE: Does your testimony look at any other rivers?

WITNESS WILDER: The Final EIR/EIS also

evaluated the San Joaquin River as well as Mokelumne River.

MR. ETHERIDGE: But does your testimony touch been the Mokelumne River?

WITNESS WILDER: No, and the reason is that it was -- it was discussed during Part 1 of these hearings that there are no effects on any of the San Joaquin River, the main stem or its tributaries, and therefore I chose not to even bother.

MR. ETHERIDGE: Okay.

WITNESS WILDER: And you can look in my -- in the Final EIR to confirm that.

MR. ETHERIDGE: Now, your testimony looks at project impacts on upstream fisheries as distinguished from Mr. Greenwood's testimony that focused only Delta fisheries; is that correct?

WITNESS WILDER: Yes.

MR. ETHERIDGE: If we could turn to Page 4 of Mr. Wilder's testimony. At Line 5 here is a header which is, "The Analytical Approach To Testimony." Do you see that?

WITNESS WILDER: Yes.

MR. ETHERIDGE: Is it your opinion -- let's shift down now to Page 4, Lines 6 through 8. Is it your opinion that, quote, "My testimony provides the

basis for my opinion that the CWF H3+ is reasonably protective of upstream fishes"?

WITNESS WILDER: That is my testimony.

MR. ETHERIDGE: Thank you. Is the Mokelumne River fall-run Chinook salmon an upstream fishery?

WITNESS WILDER: The Mokelumne River is upstream of the Delta, yes.

MR. ETHERIDGE: Did you examine the project's impacts on Mokelumne River salmonids?

WITNESS WILDER: Yes. As I mentioned, it's included in the Final EIR/EIS --

MR. ETHERIDGE: Okay.

WITNESS WILDER: -- that I cite extensively in this document.

MR. ETHERIDGE: Okay. Thank you. In your analytic work in preparing your testimony for this proceeding, did you visit any of the rivers in question and do habitat studies?

WITNESS WILDER: I'm sorry. Could you clarify?

MR. ETHERIDGE: In the analytic work that you performed in preparing your testimony for this proceeding, did you do any field visits of any of the rivers in question to do some habitat analysis or biological analysis?

WITNESS WILDER: Not specifically for this testimony, no.

MR. ETHERIDGE: Okay. On Page 4 of your testimony, Lines 19 through 20, what do you mean by the statement that, quote, "The only mechanism by which CWF can affect waterways upstream of the Delta is through changes in CVP and SWP reservoir operations caused by the project"?

WITNESS WILDER: What I mean is that reservoir operations are the only mechanism through which the upstream reservoirs can be -- I'm sorry, the upstream waterways can be affected. And that's only done by changes in flows and, to some extent, downstream -- changes in temperatures downstream of the reservoirs.

MR. ETHERIDGE: Okay. Thank you. Does the Delta Cross Channel, a CVP facility, affect fisheries?

WITNESS WILDER: That's beyond the scope of my testimony, but, yes, it does.

MR. ETHERIDGE: So is it true then, that the only mechanism by which the WaterFix project can affect waterways upstream of the Delta is through CVP and SWP reservoir operations?

WITNESS WILDER: I'm sorry. Could you repeat the question?

MR. ETHERIDGE: Well, if the Delta Cross

Channel, which is a CVP facility, can affect fisheries, is it true that the only mechanism by which the WaterFix can affect waterways upstream of the Delta is through changes in CVP and SWP water operations?

THE WITNESS: Yes, I stand my by statement. It says "waterways," not "fisheries."

MR. ETHERIDGE: Okay.

MR. ETHERIDGE: That concludes my questions. Thank you.

CO-HEARING OFFICER DODUC: That concludes your cross-examination?

MR. ETHERIDGE: It does.

CO-HEARING OFFICER DODUC: Now I have a dilemma. I said you would be the last one, but you're done early.

Let me ask, Group 18 are you prepared to conduct your 20-minute cross-examination?

MR. WASIEWSKI: Sure.

CO-HEARING OFFICER DODUC: Thank you. Excellent. Do you need to take a five-minute break? You're good? All right. We're moving full steam ahead.

So then tomorrow we will begin with Group 25, the County of Solano. Uh-oh. Maybe not?

MR. KELLER: Hi, Curtis Keller for Contra

Costa County. I'm also part of that Group 25 along with Solano County.

CO-HEARING OFFICER DODUC: Okay.

MR. KELLER: If this will be the last cross-examination that occurs today, could I make the request to go in the afternoon tomorrow, Group 25 could go in the afternoon tomorrow? We have Board of Supervisors meetings in the morning tomorrow. Our attempt was to hope to go today. But if not, Dr. Greenwood --

CO-HEARING OFFICER DODUC: That depends on Mr. Herrick, who I no longer see in the audience. And 24 -- and Ms. Meserve? Ms. Meserve, are you able to go in the morning?

MS. MESERVE: Hello. Yeah, I can do that if necessary. And then I could also inquire as to Groups 24 -- Mr. Keeling and Mr. Herrick, if they prefer to go in the morning. We'll work it out and let you know in the morning. Would that be acceptable?

CO-HEARING OFFICER DODUC: Well, I think he needs to know now.

MS. MESERVE: Yeah, well, I mean, I think we will accommodate, so he could -- we'd be happy to move things around so he can go in the afternoon.

CO-HEARING OFFICER DODUC: Well, the answer to

your question then is, if Groups 21, 24, and Ms. Meserve can go in the morning, then we will get to you in the afternoon.

MR. KELLER: I appreciate that. Thank you.

CO-HEARING OFFICER DODUC: You owe them.

All right. We will now turn to Group 18.

CROSS-EXAMINATION BY MR. WASIEWSKI

MR. WASIEWSKI: Thank you. Tim Wasiewski for the San Joaquin Tributaries Authority. I will have questions for Mr. Reyes and Ms. White.

If we can go to Mr. Reyes's testimony, which is DWR-1016. And go to Page 6, please.

So Mr. Reyes, I'm going to direct your attention to Line 2, where it says, "As in H3 and H4 and BA H3+, included new OMR flow requirements and South Delta export restrictions during October and November compared to the NAA," and then the next sentence says, "In the CWF H3+ scenario, these OMR flow requirements and South Delta export restrictions were removed."

Would you agree that export restrictions have an effect on Delta outflow? It's not directly related to the -- to the sentence.

WITNESS REYES: I apologize. I was getting thrown off on the sentence with the -- okay. So you're

just asking --

MR. WASIEWSKI: I want you to keep that sentence in mind. And then the question is do you agree that export restrictions have an effect on Delta outflow?

WITNESS REYES: It can.

MR. WASIEWSKI: Right, because when Delta exports are higher, the Delta outflow is lower, assuming nothing else changes, right?

WITNESS REYES: Yeah, that's correct.

MR. WASIEWSKI: So that's why --

If we go to Page 7 of Mr. Reyes's testimony, please.

So that's why you say on Line 5 that the CWF H3+ Delta outflows are slightly lower than the BA H3+ results in October; is that correct? Is that -- I guess the question is is that the reason?

WITNESS REYES: Yes, I believe it is.

MR. WASIEWSKI: Okay.

WITNESS REYES: You have different requirements in October between the Cal WaterFix H3+ and the BA H3+, just to be clear.

MR. WASIEWSKI: Okay. So, but if the South Delta export restrictions were also removed for November, which is what you said on Page 6, why --

shouldn't we expect that Delta outflow would also be lower in November? But you only referenced October. Shouldn't we expect it to also be lower in November is the question.

WITNESS REYES: Not necessarily. Like I said, it's a factor, not the only factor.

MR. WASIEWSKI: Well, if everything else was the same?

WITNESS REYES: Right, if everything else was the same, but I'm not sure it was in the model, so.

MR. WASIEWSKI: Is it possible that one of the differences was the amount of San Joaquin River inflow? If you don't know that's an acceptable answer.

WITNESS REYES: Yeah. I mean, if San Joaquin inflow was higher, would the outflow be higher? Is that what you're asking?

MR. WASIEWSKI: Yeah. You said that in November, Delta outflow wouldn't necessarily be lower because there are other factors. And I'm asking you in the modeling, did you increase San Joaquin River inflow to account for that?

WITNESS REYES: No, I don't think we did.

MR. WASIEWSKI: So why is it then that, in November, we don't see the same decrease in Delta outflow that you saw in October or that you reported

seeing in October?

WITNESS REYES: I'm not sure. I have to look at the modeling. I'm just saying that the exports alone, you know, having a lower requirement in November doesn't necessarily mean that that's going to translate to increased exports or more outflow.

WITNESS WHITE: Can I jump in and add something real quick? I think we're confusing export restrictions and the actual exports. So export restrictions only make a difference if that's what's controlling. So if they're -- if those export restrictions weren't controlling the exports in November, then you won't see any difference.

MR. WASIEWSKI: But the ability to export more would still be there?

WITNESS WHITE: Well, something else would have been controlling, so, no. I mean, we would have to look into the model results, but export restrictions are only going to make a difference if they're physically controlling the exports.

MR. WASIEWSKI: Okay.

WITNESS WHITE: If that's makes sense.

MR. WASIEWSKI: Thank you.

Let's go to Page 8 please of Mr. Reyes' testimony and Line 6.

So that says, "Based on my analysis and the results shown below, it's my opinion that the CWF H3+ scenario meets D1641 Fish and Wildlife and the 2008, 2009 BO requirements." And then you list the variety of the requirements that are supposedly satisfied. Do you see that?

WITNESS REYES: I do, yes.

MR. WASIEWSKI: Okay. Okay. I want to address D1641 first, and then we'll move to the Biological Opinions.

So I noticed in that list of the D1641 requirements that you say -- or that you analyzed and reported on, you didn't mention the Vernalis requirement on the San Joaquin River; is that correct?

WITNESS REYES: That is correct.

MR. WASIEWSKI: So did you analyze whether or not the Vernalis requirement would be met under CWF H3+?

WITNESS REYES: Yeah, it's -- I forget what the specific operating criteria is in the model, if we have the most up-to-date version of 1641. But the criteria that we put forth for meeting San Joaquin salinity is being met, yes.

MR. WASIEWSKI: So it's assumed -- well, I'm talking about the -- I'm talking about the -- you

mentioned salinity. I'm talking about the flow requirement at Vernalis.

WITNESS REYES: Oh.

MR. WASIEWSKI: So are you assuming in the analysis that that's being met?

WITNESS REYES: Yeah, I believe so.

MR. WASIEWSKI: So that's the underlying assumption is that San Joaquin inflow is meeting D1641 requirements?

WITNESS REYES: Yes.

MR. WASIEWSKI: So if that assumption was not correct, would that change your opinion as to whether Delta outflow -- whether the Delta outflow requirement would be met under CWF H3+?

WITNESS REYES: The outflow requirements?

MR. WASIEWSKI: Yes, because -- and I'll -- because the Delta outflow requirement is -- excuse me. Delta outflow is -- one of the components is inflow from both the Sacramento and San Joaquin. So if the Vernalis requirement was not in fact being met, would that change your opinion as to whether or not the outflow requirement was being met?

MR. MIZELL: And I'm going to object at this point. San Joaquin Tributaries Authority has gone well beyond the scope of the Cal WaterFix. This is a line

of questioning they attempted to conduct a number of times in Part 1.

The California WaterFix doesn't propose any changes to the San Joaquin system. And to imply the modeling was somehow addressing a shift in the release on San Joaquin reservoirs is incorrect. And I'm not sure that there's a basis now to continue this line of questioning when it's outside all of the -- those project impacts.

CO-HEARING OFFICER DODUC: Your response?

MR. WASIEWSKI: Yes, the modeling has been changed several times now. I'm asking about CWF H3+ and the assumptions that went into the conclusions that net Delta outflow was satisfied and then the variety of other components are -- excuse me -- requirements were satisfied and whether or not those conclusions were based on an assumption that flow at Vernalis was compliant with D1641 because, if it was not, that could impact other -- the satisfaction of other requirements. Maybe it does, maybe it doesn't. But I want to figure that out.

CO-HEARING OFFICER DODUC: Mr. Reyes, was there any change in the modeling of the San Joaquin component from what was presented in Part 1 to this current CWF H3+?

WITNESS REYES: So there was no change in our modeling of the San Joaquin as far as it relates to 1641 since Part 1, and also the No Action Alternative case actually has the same criteria as Cal WaterFix; there's no change there.

CO-HEARING OFFICER DODUC: And there's no change in either the modeling or the operational criteria applied?

WITNESS REYES: That's correct.

CO-HEARING OFFICER DODUC: I will sustain the objection.

MR. WASIEWSKI: Okay. So I won't ask with regard to Delta outflow then. But there are -- what exactly am I being precluded from? Because I didn't fully understand the objection I guess.

CO-HEARING OFFICER DODUC: The objection was that the -- there was no change from the modeling presented in Part 1 to this current version of CWF H3+ with respect to the San Joaquin River operations.

MR. WASIEWSKI: Okay. So you may have answered this question, then, based on your other responses, did you run any analysis of -- as part of CWF H3+ to see what Delta outflow would be if the Vernalis requirement was not being met?

MR. MIZELL: Objection --

MR. WASIEWSKI: If he can just confirm that or not.

CO-HEARING OFFICER DODUC: Yeah, just go ahead and answer.

WITNESS REYES: No, I did not.

MR. WASIEWSKI: Q. Did you do any analysis to see whether CWF H3+ would comply with the EI ratio if the Vernalis requirement was not being met?

WITNESS REYES: No, I did not.

MR. WASIEWSKI: Are you aware of the testimony and the evidence that's been presented in this hearing showing that there's a long history of noncompliance with D1641 at Vernalis?

MS. ANSLEY: Objection, noncompliance, unimplemented standard, we haven't established whether there's noncompliance at Vernalis.

CO-HEARING OFFICER DODUC: That was not his question, I believe.

MR. WASIEWSKI: Have you reviewed the testimony from Dan Steiner from Part 1 of this hearing which shows that there's a long history of noncompliance with the Vernalis requirement under D1641?

WITNESS REYES: That was a while ago, so I'm unclear if I reviewed that or not.

MR. WASIEWSKI: You said that there were no changes to how the San Joaquin River inflow -- how the San Joaquin River was analyzed and that the assumption was that D1641 would be met at Vernalis. Who made the decision to use that assumption in the analysis?

WITNESS REYES: What assumption are you referring to?

MR. WASIEWSKI: I believe you said earlier that the assumption essentially is that the Vernalis requirement at D1641 is satisfied and that no further analysis was done.

WITNESS REYES: Yeah, I guess that's what I said. Okay.

MR. WASIEWSKI: So do you know who made the decision to input the analysis of -- of the Vernalis requirement being satisfied?

WITNESS REYES: There is a criteria in the model that is what we're calling 1641, and the model satisfies the criteria that it's essentially forced to meet -- or not forced to, but that it's trying to meet.

MR. WASIEWSKI: Okay. Do you know where the water comes from to meet that? Because there's several sources on the San Joaquin River. Do you know which sources of water are being used to meet that requirement?

MR. MIZELL: Objection, relevance. Again, we're up on the San Joaquin system. The model treats the San Joaquin system identically under the No Project Alternative in the California WaterFix; it's factored out at that point.

CO-HEARING OFFICER DODUC: So the answer, to the question, Mr. Reyes, would be no? Or do you know?

MR. WASIEWSKI: I don't think it's a -- maybe it is a yes or no. Do you know where the water comes from?

WITNESS REYES: It would be water from the San Joaquin River system. It could come from any of the tribs. There's no way of telling which tributary contributes how much, but all of those, I think, contribute some.

MR. WASIEWSKI: Does any of the water come from behind Friant Dam as part of the San Joaquin River Restoration Program?

CO-HEARING OFFICER DODUC: You may repeat that you do not know.

WITNESS REYES: I do not know.

MR. WASIEWSKI: Okay. If we can pull up Ms. White's testimony, which is DOI 1040?

So I don't know if you can see that screen, the last sentence of your testimony, Ms. White, says

"I'm able to answer technical questions regarding the use of CalSim model and analyze CVP operations and how components from the model may be operationalized within the CVP."

So I'm going to take you up on that and ask you some technical questions on that.

If we can pull up SJTA-302. This is the written testimony of Dan Steiner that's been admitted by the SJTA as part of this Part 2 of this proceeding. Have you reviewed that?

WITNESS WHITE: I have not.

MR. WASIEWSKI: Okay. I'm going to ask you then if you agree with the general premise of this, which I can summarize for you.

But if you can scroll down to the first paragraph there so that she can also take a look at it.

"The Biological Assessment incorporates climate change into its analysis." Do you agree with that?

WITNESS WHITE: I would defer to the modelers, but I assume it includes the Q5 climate scenario that's considered climate change under Mr. Steiner's testimony.

WITNESS REYES: Yeah, the BA modeling does include Q5 climate assumptions.

MR. WASIEWSKI: Okay. And that could increase the frequency at which we see dry and critically dry years; is that correct?

WITNESS WHITE: That's my understanding, but I would defer to our modelers on what that would look like.

WITNESS REYES: It changes the temperature and some of the timing of the inflow and the precipitation patterns change. But whether it increases the frequency of the dry or critical years, I'd have to look at the data. But it's there. We have those defined. So I don't know exactly if it increases it or not.

MR. WASIEWSKI: So you don't know if by incorporating climate change you're showing more dry and critical years than you would if you didn't incorporate climate change?

WITNESS REYES: Not without doing a little bit of analysis first.

MR. WASIEWSKI: So since the flow requirements at places like Vernalis and others in the D1641 are lower in dry and critical years, the use of climate change in the analysis essentially means that compliance with those requirements under the BA can be achieved more often without having to resort to stored

water because the requirements themselves are lower. Have you looked into that?

WITNESS REYES: I think -- to me, I think I don't believe what you're saying there, which is that -- the requirements are based on year types which are defined by how much inflow reaches a certain system or water supply indices.

And those are developed without regard to claimant change. So essentially, if you have a wet year, you will know that by the index telling you how much inflow you have in the system. And then there are requirements that are based on these water supply indices.

So it's based on the water supply, not -- it doesn't really have to do with if climate change affected how something might -- how the system might be different in the future. If it's drier, then you would have less supply, which then you would follow the requirement that says for a lesser volume you have such and such requirement that you have to adhere to.

MR. WASIEWSKI: So by incorporating climate change, you can -- you will show less supply, which means that you could be bumped into a lower or a drier -- excuse me, a drier year type classification which would essentially lower the requirements that the

projects have to meet?

WITNESS REYES: It wouldn't lower the requirements. It would bump you into the correct category of you're trying to meet.

MR. WASIEWSKI: Okay. Yes, it would bump you into a category which has lower requirements; can we agree on that?

MR. MIZELL: Objection, asked and answered.

CO-HEARING OFFICER DODUC: Hold on. Hold on. What was the question again?

MR. WASIEWSKI: I asked Mr. Reyes if we could agree that it could -- having drier -- having more dry year types -- excuse me.

I guess I asked Mr. Reyes if we could agree that the require -- you have -- the climate change will give you more dry year water year classifications, which will --

CO-HEARING OFFICER DODUC: Hold on, stop.

MR. WASIEWSKI: Sure.

CO-HEARING OFFICER DODUC: I thought -- my recollection was your answer to that was you didn't know.

WITNESS REYES: That's correct. I hadn't analyzed if it's more frequent that we're having drier year types.

MR. WASIEWSKI: But if it were the case, you would -- the requirements would be lower? I mean, the requirements would be what they are for the water year type, but they would be lower because drier water years have lower requirements; can we agree on that?

WITNESS REYES: I would say the requirement is a suite of requirements that -- that change according to water supply, and those are unchanged.

MR. WASIEWSKI: Okay. My time's up, so thank you.

CO-HEARING OFFICER DODUC: I'm still trying to understand your last question, but okay. All right.

I think that will wrap this up for today. We will -- I thought I saw Mr. Herrick make an appearance. Ms. Meserve, were you able to confirm? That was a yes?

MS. MESERVE: Yes.

CO-HEARING OFFICER DODUC: All right. So we will begin tomorrow back in the Coastal Hearing Room with Mr. Herrick. He's conducting his cross-examination. Thank you.

(Whereupon, the proceedings recessed at 4:21 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 which typewriting 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 12th day of March, 2018.

DEBORAH FUQUA

CSR NO. 12948