Staff note: Strikeouts made pursuant to Hearing Officers' Rulings

BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

CALIFORNIA WATERFIX WATER RIGHT CHANGE PETITION HEARING)

JOE SERNA, JR. BUILDING

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

COASTAL HEARING ROOM

1001 I STREET

SECOND FLOOR

SACRAMENTO, CALIFORNIA

PART 2

Friday, February 23, 2018

10:00 a.m.

Volume 4

Pages 1 - 232

Reported By: Candace Yount, CSR No. 2737, RMR, CCRR
Certified Realtime Reporter

Computerized Transcription By Eclipse

APPEARANCES

CALIFORNIA WATER RESOURCES BOARD

Division of Water Rights

Board Members Present:

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

Staff Present:

Dana Heinrich, Senior Staff Attorney
Andrew Deeringer, Senior Staff Attorney
Conny Mitterhofer, Supervising Water Resource Control Engineer
Jean McCue, Water Resources Control Engineer
Hwaseong Jin

PART 2

For Petitioners:

California Department of Water Resources:

James (Tripp) Mizell
Jolie-Anne Ansley

The U.S. Department of the Interior:

Amy L. Aufdemberge, Esq.

INTERESTED PARTIES:

For Clifton Court, L.P.:

Suzanne Womack

For Snug Harbor Resorts, LLC:

Nicole S. Suard, Esq.

For California Water Research:

Deirdre Des Jardins

APPEARANCES (Continued)

INTERESTED PARTIES (Continued):

For County of San Joaquin, San Joaquin County Flood Control and Water Conservation District, and Mokelumne River Water and Power Authority:

Thomas H. Keeling

For Sacramento County Water Agency, Glenn-Colusa Irrigation District, Biggs-West Gridley Water District, Carmichael Water District as well as Placer County Water Agency and the County of Sacramento:

Aaron Ferguson

For State Water Contractors:

Stefanie Morris

For North Delta Water Agency & Member Districts:

Meredith Nikkel

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

Michael Jackson

I N D E X

Friday, February 23, 2018 10:00 a.m.

PROCEEDINGS

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CO-HEARING OFFICE DODUC: Please sit down.

Good morning, everyone. To most of you, welcome back to this Water Right Hearing on the Change Petition for the California WaterFix Project.

I am Tam Doduc, Board Member and Hearing Officer. To my right is Board Chair and Co-Hearing Officer Felicia Marcus. We, I believe, will be joined later by Board Member Dee Dee D'Adamo who will be sitting to the Chair's right.

On my left are Andrew Deeringer, Dana Heinrich, Conny Mitterhofer, Jean McCue, and Hwaseong Jin.

We're also being assisted today by Mr. Hunt, Miss Perry and Mr. Baker.

With that, the usual announcement. And since it's Casual Friday, I'll be more casual about it. If the alarm goes off, leave. So notice the exit --

(Laughter.)

CO-HEARING OFFICER DODUC: -- closest to you. Cross the street to the park, and if you would like to return with us, then stay there and wait for the all-clear signal.

Second announcement: As always, speak into the microphone for the various recording features that's going on for this hearing.

We have a court reporter here today, and if you need to have access to the transcript earlier than the conclusion of Part 2, please make your arrangements with her.

And most importantly -- I'm staring at my Co-Hearing Officer -- please take a moment and make sure all your noise-making devices are turned to off, silent, do not vibrate. Even if you think they are, check.

All right. With that, before we begin, I know there might be a couple of housekeeping matters we need to address.

I believe Miss Womack actually made her way up front before Miss Des Jardins.

So, Miss Womack, did you have a housekeeping item?

MS. WOMACK: Yes -- Yes, I did.

Is this on?

CO-HEARING OFFICE DODUC: Thank you for sitting and patiently waiting.

MS. WOMACK: Oh. You know, I'm a brownnoser. I try to do my best.

CO-HEARING OFFICE DODUC: You're a teacher. You're setting a good example.

MS. WOMACK: Yeah. Well, you know, I'm retired now and I'm trying to break the mold but maybe not this time.

First of all, I had to take my mother to an appointment yesterday. My father was at the at the VA with another appointment. Old parents.

I -- I -- I want to cross this panel.

CO-HEARING OFFICER DODUC: Okay.

MS. WOMACK: Is that something I can still do?

CO-HEARING OFFICE DODUC: I believe so. Where are you?

MS. WOMACK: 43.

CO-HEARING OFFICER DODUC: Yes.

MS. WOMACK: I know my number.

CO-HEARING OFFICE DODUC: You -- Yeah. So you're right after Miss Suard. I thought I saw Miss Suard earlier today.

MS. WOMACK: Okay.

MS. SUARD: I'm here.

CO-HEARING OFFICE DODUC: Well, thank you. She's in position already. All set.

Yes, you will be after Miss -- after Miss Suard.

MS. WOMACK: Okay. The second thing is just a clarification.

When you sent this (indicating) to me about the -- the Public Record Act, you said that, you know, anybody can -- anybody can make a public record after a request.

You know, I'm just having -- I -- I can sympathize with your troubles.

I'm having trouble getting a response from DWR. I tried in April 11th, 2017, public request. I then did to the whole group because I did want it before the hearings, and I wanted to include it. So the November 14th request, I made more public records request, which should have been enough time to get the two documents I got. Instead, I got a document back that said, there was so much, that it was going to take until February 14th. I think it was about February 8th or 9th, I got two little tiny documents that were memos. I got more from people who are Protestants who sent me things.

Oh. Here's something I found.

Anyway, I am just not getting responses to Public Record Act requests.

You know, I'm just trying to farm. I'm trying to -- I'm trying to make a living farming. And it's

really hard when people don't answer, or they -- or their requests are -- or their answers --

CO-HEARING OFFICER DODUC: Miss --

MS. WOMACK: -- are flippant, so --

CO-HEARING OFFICE DODUC: Miss -- Miss Womack, let -- let me see if I can clarify.

MS. WOMACK: Thank you so much.

CO-HEARING OFFICE DODUC: I'm turning to the attorneys.

The intent of the ruling that was sent to you was to simply say that PRA requests are not intended to be served on all parties and to be included in the record.

Now --

MS. WOMACK: The -- The ones, though, that I wanted to be part of --

CO-HEARING OFFICE DODUC: Requests. Once you receive the document, if the document are relevant to what's going on in the hearing, if you intend to use it as part of your cross-examination or your rebuttal, you, of course, may introduce that into the record and, of course, others might object and we'll hear those objections and responses then.

The only thing that the ruling was intended to advise you of is that using the service list to send

PRA requests is not the appropriate forum. And PRA requests do not necessarily to into the evidentiary record.

I believe the ruling said --

MS. WOMACK: I understand that. I just saw Patrick Porgans using a public record after -- This is not being a lawyer. I, you know -- I'm just doing my best to try to get information. And, frankly, I'm not getting it. So I -- You know, it's hindered my case.

CO-HEARING OFFICE DODUC: Mr. Mizell, do you have a status on responding to Miss Womack's PRAs?

MR. MIZELL: I do know that the Department has received numerous communications from Miss Womack. Most consisted of interrogatories and were not appropriate PRA requests. The few things that were PRA requests, I believe that they've been responded to, but I can certainly make contact with the attorneys who handle PRAs for the Department and inquire as to any outstanding PRAs that still exist.

CO-HEARING OFFICE DODUC: Please do so.

MS. WOMACK: Yeah. I asked about public safety records, how -- you know, because since Clifton Court is a dam, it's treated differently.

Anyway, I don't want to take the Court's time but I don't have su -- I don't have answers that are

appropriate, and some of the answers are just plain wrong.

I -- You know --

CO-HEARING OFFICE DODUC: Miss Womack -- Miss Womack --

MS. WOMACK: No. But answering something just to answer it and putting in --

CO-HEARING OFFICE DODUC: Miss Womack.

MS. WOMACK: -- fabricated things --

CO-HEARING OFFICE DODUC: Miss Womack.

MS. WOMACK: -- is wrong.

CO-HEARING OFFICE DODUC: Miss Womack, that's enough.

MS. WOMACK: Okay.

CO-HEARING OFFICER DODUC: Thank you.

MS. WOMACK: I -- I appreciate you letting me --

CO-HEARING OFFICE DODUC: Yes.

MS. WOMACK: Thank you. Bye bye.

CO-HEARING OFFICE DODUC: I'm only doing that because someone found my water bottle. It was missing earlier today.

Miss Des Jardins.

MS. DES JARDINS: I'm glad you're feeling good.

CO-HEARING OFFICER DODUC: Let's both feel good.

MS. DES JARDINS: I have an issue.

So before Part 1, I raised the issue that some of the documentation about the modeling that's required under the Hearing Notice about the logic, assumptions, and development of the models wasn't provided.

And I filed a -- questions, which I asked the Hearing -- Hearing Officers to require DWR to answer because I found evidence in the 2004 period response that they were promising to maintain documentation about, for example, the development of the Sacramento Valley hydrology.

CO-HEARING OFFICE DODUC: Let me interrupt and ask.

There's been so many motions and so many responses.

Is this a motion we've already responded to and ruled on?

MS. HEINRICH: I -- I don't know. I'm sorry. I'm not sure what motion Miss Des Jardins is referring to.

MS. DES JARDINS: Well, Miss Heinrich, you then contacted me and said there wasn't enough time to respond to my request that DWR answer this and sent me

a subpoena form. And I worked with PCFFA to subpoena the information.

I also requested correspondence and documents relating to specification in the model runs, including stuff at the WaterFix hearing and the Biological Assessment, because I thought those might be of as much interest as the model runs themselves.

That -- That -- We have still not received a legally adequate response. DWR said in Part 1 they produced all documents responsive to the request. I sent a letter to the Hearing Officers and to DWR asking for more adequate response.

When they said they produced all documents, I asked for a legally adequate response that would list what was being withheld and why.

And at the end of Part 1, the Hearing Officer, Ms. -- Ms. Doduc, you said you would take it under consideration.

I am still waiting for that. I am handicapped by not having those documents, not having had those during the entirety of Part 1, not having them for Part 2.

Some of them also included -- would have included correspondence and documents shared with the Water Board about the specification of the Boundary 2

scenario --

CO-HEARING OFFICE DODUC: Let's -- Let's stop --

MS. DES JARDINS: -- so --

CO-HEARING OFFICER DODUC: -- right there.

Mr -- Mr. Mizell, when you check on the status of Miss Womack's DRAs, please confirm with your own people whether or not there are any outstanding -- at least in your opinion -- documents in response to Miss Des Jardins' request.

Miss Des Jardins, whether you and Mr. Mizell and DWR agree or disagree on what you believe to be legally . . .

What is the word you used?

MS. DES JARDINS: It's a sub --

CO-HEARING OFFICER DODUC: Adequate.

MS. DES JARDINS: It's a subpoena. There's a legal definition of an adequate response.

CO-HEARING OFFICE DODUC: Well, if I'm a attorney -- And you play one right now.

Mr. Mizell, if you can please report back to us on Monday, based on your research, your understanding, of DWR's responses to both Miss Womack and Miss Des Jardins.

MR. MIZELL: I can certainly do that.

As far as subpoenas that we believe are outstanding at the time, I'm aware of only two, and that would be the City of Antioch and one filed by Earthjustice recently.

I believe we've responded to all other subpoenas at this time, but I will do some due diligence and let you know.

CO-HEARING OFFICER DODUC: All right.

MS. DES JARDINS: I did want to add, because the Hearing Officer said she'd take it under advisement, that it's -- you know, I considered it to be tolled on the deadline for a Motion to Compel Production.

So I believe that is still outstanding. There was a response. We asked for more legally adequate response, which is now -- thank you very much -- being provided.

CO-HEARING OFFICE DODUC: All right. You brought it to our attention. Mr. Mizell will do his research, we'll do our research, with respect to whether there's any outstanding motion.

MS. DES JARDINS: Okay.

MS. HEINRICH: I'm not aware of any outstanding Motions to Compel that you filed.

MS. DES JARDINS: This was orally on the last

day of the hearing, and the transcript states that Miss Doduc said she'd take it under advisement. I made it orally, and I requested -- and I just said what a legally adequate response --

CO-HEARING OFFICE DODUC: Thank you.

MS. DES JARDINS: -- is not what it was.

CO-HEARING OFFICE DODUC: We'll look into it.

MS. DES JARDINS: Okay. And then just one more item.

CO-HEARING OFFICE DODUC: I didn't notice it evaporating.

MS. DES JARDINS: Yeah. Which is -- I'm sorry. It is difficult.

I can't subpoena DWR witnesses without having dates --

CO-HEARING OFFICE DODUC: You raised that issue yesterday. We are taking it under consideration. We will get back to you on Monday.

MS. DES JARDINS: Okay. Wonderful. Thank you.

CO-HEARING OFFICE DODUC: All right. I think we are back on track.

Miss Suard, again, thank you for joining us yesterday. I'm sorry we didn't -- wasn't able to get to you.

MS. SUARD: That's fine. Thank you for letting me ask questions today.

CO-HEARING OFFICE DODUC: Actually, before I get to you, though.

Mr. Keeling, were you able to get in touch with Miss Meserve, and will you or someone else be able to stand in for her today in cross-examining this panel?

MR. KEELING: I appreciate you asking, and the answer is, yes, I did speak with Ms. Meserve, who wanted me to convey again her -- her gratitude for the accommodation.

We were not able to facilitate that, so what we're doing is rejiggering everything to -- to translate those questions into later inquiries of other witnesses.

CO-HEARING OFFICE DODUC: Did you say rejibbering (phonetic)?

MR. KEELING: Rejiggerging. You know --

CO-HEARING OFFICE DODUC: Rejiggerging. Oh, okay.

MR. KEELING: I don't know. I may be jibbering, too, but that's not what I said.

CO-HEARING OFFICER DODUC: All right. Thank you.

Yes. The Chair has -- has prompted me to commend you, Mr. Keeling, for not wearing a tie today.

MR. KEELING: And I appreciate not being disciplined once again.

CO-HEARING OFFICER DODUC: All right. So we will have cross-examination by Miss Suard, then Miss Womack, and then Mr. Ferguson, I believe.

And as far as I have, that would be the cross-examination that remains for this panel.

Miss Suard.

MS. SUARD: Is this on? Yeah.

CO-HEARING OFFICE DODUC: It is.

GWEN BUCHHOLZ,

JOHN BEDNARSKI and

SHANMUGAN PIRABAROOBAN,

called as witnesses by the Petitioners,

having previously been duly sworn, were examined and testified further as follows:

MS. SUARD: Okay. Nicki Suard for Snug Harbor and Nicole. That's my formal name.

I want to be asking questions primarily of Miss Buchholz and Bed -- Mr. Bednarski. I will be asking for:

DWR-1008, Page 8. That's simply a map for referrals.

1022, which is Mr. Bednarski's testimony, and we're going to look at Page 2, 3, 4, 5, 8.

1032, Page 1. It only has one-page.

And 1035, Page 3.

I also have some of -- some graphics of my own. I don't know if we'll need to refer to it.

I'd -- I'd like to start with DWR-1032, please.

(Exhibit displayed on screen.)

CROSS-EXAMINATION BY

MS. SUARD: I suppose this could be either Miss Buchholz or -- or Mr. Bednarski. Which one would be -- If I had a question about how CFW (sic) H3+ impacts flows, which one would be the best to answer that? Operations of CFW (sic) H3+.

CO-HEARING OFFICE DODUC: Miss Ansley.

MS. ANSLEY: I would just like to -- maybe not much of an objection. But Miss Buchholz is here for Project Description. Mr. Bednarski's here for construction impacts.

Perhaps you might have missed the reformatting of the panels. Mr. Miller, who was originally on Panel 1, is the expert on operations and he'll be sitting on Panel 2 later today.

MS. SUARD: Okay. We can back -- Okay. So I

will wait for Panel 2 on operations questions related to flow.

I do have a question regarding -- related to Mr. Bednarski on that.

And, Mr. Bednarski, specifically, January 23rd, I believe it was, there was a meeting of contractors and subs in -- here in California and in Sacramento, and you were the speaker.

And you referred to -- I believe that's this right date. It might have been a little earlier.

You referred to the California WaterFix Project as starting as early as June 1st, but you also referred to a phased Project.

So I'm a little confused here, because at that meeting for potential contractors, you referred to and -- and gave us a link to a phased Project graphic, and yet here you're talking about CWF H3+.

And I -- I just wondered if you could explain to me which Project is happening.

MR. MIZELL: I'm going to object to the --

CO-HEARING OFFICE DODUC: Your -- Hold on to your objection, because, as I understand Miss Suard's question, it's one that Mr. Bednarski and Miss Buchholz may answer.

And that question is: Is CWF H3+ the Project

currently being proposed in this Petition before us?

MS. SUARD: Okay. That's the question.

WITNESS BEDNARSKI: Yes, it is.

MS. SUARD: Okay. Can I ask, then, why you would represent a different Project to potential contractors who are all required to be there if they wanted to bid for -- bid to build the tunnels?

MR. MIZELL: This is where I'll renew my objection to discussions of the staged construction approach.

CO-HEARING OFFICE DODUC: Mr. Bednarski, since this is a topic that I think we'll be revisiting many times, perhaps it would be helpful to answer the question with respect to your opinion, and that of Miss Buchholz, for that matter, your understanding of the Project as currently proposed today.

WITNESS BEDNARSKI: My understanding of the Project as it's currently proposed today is a single-stage Project, 9,000 cfs, three intakes, two main tunnels, and the Clifton Court Forebay modifications.

In reference to my participation at that meeting, I believe it was the Industry Day meeting, where we were alerting consultants and contractors that DWR had issued a Notice that there was the potential

for a staged Project and that they should take that into consideration as they prepared responses to our cues that were being issued at that time.

CO-HEARING OFFICE DODUC: The potential.

WITNESS BEDNARSKI: The potential.

CO-HEARING OFFICE DODUC: You have not made that decision, and that's not the Project that you're testifying to.

WITNESS BEDNARSKI: That's correct.

MS. SUARD: Okay. Thank you.

So, I'm going to not talk about the -- the -- the flow. That'll be in the next panel.

I -- I think it's really helpful to refer to maps. Let me go to where that map is.

So DWR-1008, if that could be pulled up, Page 8.

(Exhibit displayed on screen.)

MS. SUARD: And I'm -- I'm actually asked to pull this up, and maybe if we could focus on the map and focus more on the North Delta area. I think Miss Womack -- Womack's going to be asking questions of barge traffic more in the South Delta, so I'm going to focus more in the -- Can we enlarge it even a little bit more?

(Exhibit displayed on screen.)

MS. SUARD: We've been over -- Maybe from, oh, Highway 12 and above is what we would need to show.

(Exhibit displayed on screen.)

MS. SUARD: So I'm -- I'm going to be asking about barge traffic and intake building, and that would be Mr. Bednarski; right?

WITNESS BEDNARSKI: (Nodding head.)

MS. SUARD: Okay. I -- I also . . .

You had referred to a couple of the other intakes that have already been built.

Were you involved in the building of those other intakes that you listed on Page 8: Red Bluff, or Freeport, or the Glenn-Colusha (sic) Colusa irrigation screens?

WITNESS BEDNARSKI: No, I was not.

MS. SUARD: But you gave -- give those as examples of functioning fish screens; is that correct?

WITNESS BEDNARSKI: Yes.

MS. SUARD: Okay. Have you reviewed the -- how those fish screens were built?

THE WITNESS: Yes, we have, either myself or individuals that have worked on my Project Team.

MS. SUARD: Okay. So could I -- I'd like to ask you some questions about the Freeport one.

So you're -- you're familiar with how Freeport

functions; is that correct?

WITNESS BEDNARSKI: Yes, I am, or Mr. Pirabarooban would be able to respond to those questions.

MS. SUARD: Okay. Mr. Pirabarooban, were you involved with the design of -- of the Freeport?

WITNESS PIRABAROOBAN: No.

MS. SUARD: No.

Okay. But you're familiar with it.

WITNESS PIRABAROOBAN: Yeah. I had -- We had engineers who designed the facility within our Project and we have talked to those folks.

MS. SUARD: Okay. So, I have gone out on a boat and observed the Freeport facility in action.

Could either of you explain to me the purpose of the windshield wipers?

CO-HEARING OFFICE DODUC: I'm sorry?

MS. SUARD: I -- I'm sorry. I don't -- Let me -- Let me describe it better.

There's a fish screen and there is a gigantic wiper that goes by slowly (indicating), and then it goes back slowly the other way (indicating).

So I -- What is that called? Mr. Bednarski knows what it is.

WITNESS BEDNARSKI: I would -- I would hazard

a guess that you're referring to the screen-cleaning device that is in continuous operation on the screens.

MS. SUARD: Okay. And the screen-cleaning device, that -- Can -- What is it cleaning? Water's flowing through it; right?

WITNESS BEDNARSKI: It's generally removing suspended material that would get impinged on the screen while it's in operation, and that material needs to be removed periodically to ensure the efficient operation of the screen.

So you could have small debris that gets caught on the screen and needs to be removed. And we would have similar features to that on the three intakes that we're proposing, too.

MS. SUARD: So when it -- it's -- wipes by, does it, like, just move the -- the particles, or whatever, off the screen? Does it push it through the screen? Or what does it do?

MS. ANSLEY: I'd like to lodge an objection right now.

I want to make sure that we're talking about now -- What was the term of art? "Trash cleaning screen" or --

CO-HEARING OFFICE DODUC: Wind -- I like "windshield pipers."

MS. ANSLEY: Windshield -- I'd like to know whether we're talking in the hypothetical or we're talking about the Freeport's actual mechanism.

MS. SUARD: I'm asking about Freeport.

MS. ANSLEY: Oh, okay. So that is to say, you know, unless he knows, it also calls for speculation. He's -- He's -- He's trying to help the witness and guess at what she's asking a question about, so --

CO-HEARING OFFICE DODUC: I understand.

MS. ANSLEY: -- it may be calling for speculation.

WITNESS BEDNARSKI: Yeah. I -- I don't have details on how their screen-cleaning device works. You know, I would only be speculating as to the actual method of removal of the debris on the screen as the device passes by.

MS. SUARD: Okay. Does the amount of product on the screen change depending on the velocity of the flow going by?

MS. ANSLEY: Same objection.

CO-HEARING OFFICE DODUC: Do you know?

WITNESS BEDNARSKI: I -- I would only be able to speak in general that, as material accumulates, that it would disrupt the even flow pattern of water through the screen and potentially cause, you know, bad

distribution of water or hotspots, as we call those, and so that's why you want to remove the material so you continue to get a uniform flow through the screens.

CO-HEARING OFFICE DODUC: Perhaps, instead of speaking in general . . .

Well, as Mr. Jackson sometime yesterday put out, you're only in the 10 percent conceptual planning stage.

But is any of that -- is any of that applicable to the screens that you're proposing at this time to install at these intakes for the WaterFix Project?

WITNESS BEDNARSKI: Yes. As I mentioned, we would have similar devices on each of the three intakes that we're proposing, though the details of those cleaning devices has not been developed at this point in time. It's been recognized that we'll need something like that.

CO-HEARING OFFICER DODUC: Okay. So, Miss Ansley, your objection is overruled because that is relevant.

MS. SUARD: So, do you know of any studies that indicate what kind of particles are getting stuck on the Freeport screen?

WITNESS BEDNARSKI: I -- I have no knowledge

directly of -- of what takes place at -- at Freeport --

MS. SUARD: Okay.

WITNESS BEDNARSKI: -- in regards to --

MS. SUARD: You don't know any -- any followup research to show that those screens aren't actually skill -- killing fish?

MS. ANSLEY: Again, at Freeport?

MS. SUARD: At Freeport. Sorry. At Freeport.

Freeport's, like, a mini version of what's being proposed, three different intakes, so I'm talking about Freeport specifically.

MR. MIZELL: And now I'm going to object to investigating the effectiveness of the screens with regards to the biological impacts.

Regarding Mr. Bednarski's testimony, as we went over yesterday it's about the feasibility of construction, not about the biological effectiveness.

CO-HEARING OFFICE DODUC: So noted.

MS. SUARD: When could we ask about biological impact?

CO-HEARING OFFICE DODUC: That would be Panel 2.

MS. SUARD: Panel 2. Okay.

I will move on to the questions of barge travel.

And there was -- Yesterday, it also got a little bit confusing in that Panel 1 talks about impacts to navigation, but Panel 2 talks about impacts to recreation. And sometimes those two factors combine.

So should I be asking questions about impacts to navigation?

CO-HEARING OFFICE DODUC: I don't believe Panel 1 is discussing impact to navigation.

Panel 1, Mr. Bednarski -- and, again, we'll take the blame for this for splitting up his testimony -- is focusing on the feasibility of construction.

MS. SUARD: Okay. So, for example, on Page 3 of Mr. Bednarski's testimony, you describe . . . the width of channels and the barge traffic necessary -- You compared it to Freeport, actually. And -- And your testimony says that boat passage will remain open at all times.

So I'm -- I am a little concerned that the planners are -- are not adequately aware of impacts to navigation and boating from that barge travel.

And has -- has there been an analysis of the wake impact when a barge is traveling against the tide?

MS. ANSLEY: Again, a clarification: On

impact to anything? To something in specific?

MS. SUARD: In -- Specifically, barges throw larger wakes, 4-foot or higher, when they are traveling very slowly but against the tide.

And that would indicate that barges must always travel with the tide when it's coming and going to avoid damages from those wakes to levees, to boat docks.

And I'm asking: Was that analysis done to avoid impacts to any -- any -- any structure along the waterways?

MR. MIZELL: I'm going to object to the question: It's assuming facts not in evidence.

We've seen those studies produced by Miss Suard regarding this 4-foot wake effect that she's describing and the requirements that barges travel on outbound tides only absent something that can authenticate those assertions, and the question assumes facts not in evidence.

CO-HEARING OFFICE DODUC: We'll strike out her assertion, but her question remains as to whether or not any studies were conducted.

MS. SUARD: Im's -- I'm asking if there's studies, and I personally have observed that.

CO-HEARING OFFICE DODUC: You may testify

during your own case in chief to that, Miss Suard.

MS. SUARD: I -- I'm also concerned about --

CO-HEARING OFFICE DODUC: Miss Suard, did you want an answer from Mr. Bednarski, or was that a "no"?

MS. SUARD: Yeah. I didn't -- I didn't get any. I think he said "no."

WITNESS BEDNARSKI: Well, I -- I didn't know if there was a question left there.

I am not aware of any studies that you refer to that would discuss that.

MS. SUARD: Okay. Are you aware of the width -- Well, I think -- Let's -- Let's go ahead and refer to this map here.

(Timer rings.)

MS. SUARD: Sorry. I have a little bit more.

I'm going to focus on the North Delta area.

CO-HEARING OFFICE DODUC: So, Miss Suard, what --

MS. SUARD: Yeah.

CO-HEARING OFFICER DODUC: -- additional questions do you have and --

MS. SUARD: This is -- just a few minutes --

CO-HEARING OFFICER DODUC: Okay.

MS. SUARD: -- depending on Mr. Bednarski's answers.

Regarding barge travel, there was a lot of description about the barge travel in the South Delta area.

How are the parts for intake structure going to get to the North Delta's spots indicated in the map? Are they going to go up the Sacramento River, or are they going to go up Steamboat Slough?

WITNESS BEDNARSKI: If you're referring to barges themselves that would be made for deliveries of materials, I -- I don't believe we have any barge landings identified at any of the three intakes any longer. Originally, some early iteration of the Project, we had one up at Intake Number 2. That's since then been deleted.

There will be waterborne traffic required to install the sheet piling for each of the temporary coffer dams, each of the three intakes, but we're not expecting to be making barge deliveries to any of the in -- three intake locations, to the best of my knowledge.

MS. SUARD: Okay. You -- You do discuss barge traffic up into Snodglass -- Snodgrass Slough, which is in the North Delta area, I'm assuming over to where that's roughly where you have that intermediate fore -- forebay.

WITNESS BEDNARSKI: (Nodding head.)

MS. SUARD: How will that -- those barges travel? Along what route?

WITNESS BEDNARSKI: (Examining document.)

I don't know that we have been prescriptive about the route that they would take. That would be generally up to the barge operator in concurrence with the Permits that they would be able to get to -- to navigate that way, if -- if they so choose to make deliveries by barge to that location.

MS. SUARD: So --

WITNESS BEDNARSKI: So --

MS. SUARD: -- it's possible?

WITNESS BEDNARSKI: -- we have -- we have not been prescriptive in the EIR/EIS about how exactly barges would get to the specific barge landings that we've identified.

MS. SUARD: So how would potentially affected parties know to be talking about impacts to them if -- if you don't know where those barges are going to be going?

WITNESS BEDNARSKI: Well, we -- we do know their end point, and we can only speculate on where they would be starting, depending on what deliveries they might be making. But, you know, to the best of my

knowledge, we do not identify a specific route to that location.

MS. SUARD: Okay. Just one more question, then, going back to velocities and these fish screens. And -- And we can refer specifically to Freeport if that makes it better.

Your testimony talked about specific velocities -- velocity that would be needed for the -- each of the intakes.

Do you need me to refer to it?

WITNESS BEDNARSKI: Yes. Could you identify where in my testimony you're referring to?

(Exhibit displayed on screen.)

WITNESS BEDNARSKI: Are you referring to Page 7 of my testimony?

MS. SUARD: I'm looking at Page 7, but I highlighted something different.

Yes. Sorry. Down at the bottom. The .20 feet per second.

What happens if -- if there's different velocity -- different . . . flow velocity in the river? What -- I -- I didn't understand how it's going to be regulated at that flow right at that point.

WITNESS BEDNARSKI: So, this -- this velocity of .2 feet per second is the -- what we refer to as the

approach velocity of the water entering the screens.

And this has been determined to be satisfactory to allow the Delta Smelt to be able to pass by the screens without being drawn into the screens.

This velocity was given to us by the Fish Technical Team that I've referred to in my earlier testimony. I believe it was in Part 1. We can refer to that if necessary.

But to ensure that the .2 feet per second is met across the entire face of the screen that's in operation, we have a series of control valves, gates, inside, behind the screens, and flowmeters that work in conjunction with one another to ensure the even distribution of water across the entire length of the screen.

And I believe, in my previous testimony, I went to some great length to discuss that in Part 1. That was in my DWR-57.

We provided some graphics that showed where all of these devices, these controlling devices, would be placed behind the screens and operated to ensure an even flow distribution.

MS. SUARD: And -- And these --

(Timer rings.)

MS. SUARD: -- kinds of operations can function even in high-flow periods to -- to monitor the -- how much flow is going through?

WITNESS BEDNARSKI: Do -- Do you mean high flows in the -- in the Sacramento River?

MS. SUARD: Yes, high flows in Sacramento River like, you know, the flooding we had in February 2017.

WITNESS BEDNARSKI: Yes. That's our anticipation. By utilizing these gates, and the gates would operate then.

When there's high flows, that means there's a high water level elevation in the Sacramento River. We'd be throttling the gates to control the hydraulic radiant coming in through the screens and then evenly distribute that flow across all of the screens.

So, yes, we believe that's quite possible. In fact, we've studied that during high-flow conditions and low-flow conditions to make sure that our -- our gate operation and the flowmeter operation would allow that even distribution of flow.

MS. SUARD: Okay. And I was going to ask about low flows, so you just answered that.

WITNESS BEDNARSKI: (Nodding head.)

MS. SUARD: Okay. The Freeport facility, I

believe, after it was constructed, there was addendum to have a backflow prevention valve added so that, when it took in too much water, it -- it could be -- you know, reduce the tunnel capacity between the Freeport intake and where the water's going.

Is that anticipated for this facility, too, these -- each of these intakes?

WITNESS BEDNARSKI: I -- I'm not aware of the specifics of the modification that you're referring to.

We're not expecting to have sort of a backflow device, if that's what it's called, at Freeport. We'll be relying on our flowmeters and totaling up the flow through the intake such that it meets what is required at the delivery pumps down at Clifton Court to -- to make sure everything is balanced.

So we don't expect to have any overflow type conditions that we have to have a backflow preventer in place for.

MS. SUARD: Okay. And . . .

CO-HEARING OFFICE DODUC: Anything else?

MS. SUARD: I -- I'm sorry. I do. I just want to make sure I'll have the opportunity to ask about impacts to fish from those fish --

CO-HEARING OFFICE DODUC: In Panel 2.

MS. SUARD: Okay. Thank you.

CO-HEARING OFFICE DODUC: Thank you.

Miss Womack.

MS. WOMACK: Thank you.

Good morning. Suzanne Womack, Clifton Court L.P., and we have just a few questions.

CROSS-EXAMINATION BY

MS. WOMACK: Mr. Bednarski, in your testimony, you talk about the five key features, and you mention the Intermediate Forebay and the Clifton Court Forebay.

Clifton Court Forebay is actually a dam. Is the Intermediate Forebay a dam as well?

WITNESS BEDNARSKI: We're -- We're expecting that we'll have to construct that in accordance with Division of Safety of dam requirements, yes.

But we -- we haven't made that determination at this point. That will be investigated during preliminary design.

MS. WOMACK: So there's specific dam regulations that are in place.

Is there -- Will that be included, the actual safety of dams? Or -- Or have I missed that already? The safety of dams regulations by the Federal government?

MS. ANSLEY: Asked and answered.

He just answered that.

MS. WOMACK: Oh, I'm confused, too.

It -- So there are specific dam safety regulations?

WITNESS BEDNARSKI: (Nodding head.)

MS. WOMACK: So the Intermediate Forebay is a dam.

WITNESS BEDNARSKI: We haven't necessarily made that determination at this point but we will be consulting with the Division of Safety of Dams during preliminary design, and that structure would be designed in accordance with their requirements, if necessary. So they will be involved in the next stage of the Project, which would be preliminary design.

MS. WOMACK: Okay. And so -- And -- And they were involved with Clifton Court Forebay Dam design.

WITNESS BEDNARSKI: I cannot comment on that. I was not involved in that Project.

MS. WOMACK: Okay. Would -- Would that be in the materials somewhere?

CO-HEARING OFFICE DODUC: You do not know.

WITNESS BEDNARSKI: I don't know.

MS. WOMACK: I mean, we've been given stuff going back, loads and loads of -- I mean, I'd like to know that.

Okay. So, let's see.

You talk about putting in coffer dams, and I know these coffer dams are poundings, and they're poundings and pounding and pounding.

MR. MIZELL: Objection: Assumes facts not in evidence.

CO-HEARING OFFICE DODUC: Well --

MS. WOMACK: How else do you put a coffer dam in?

MR. MIZELL: This was discussed in --

CO-HEARING OFFICER DODUC: Miss Womack --

MR. MIZELL: -- Part 1.

CO-HEARING OFFICE DODUC: Miss Womack, let's just ask your question, please.

MS. WOMACK: Oh. I just wonder if you're going to be putting in coffer dams 24/7 because --

CO-HEARING OFFICE DODUC: Let's stop there.

MS. WOMACK: Well, I -- I -- Is it going to be an 8:00 to 5:00 job? Will it be -- I mean, I want to know when the pounding will take place.

MR. MIZELL: Can we cover that in parts?

CO-HEARING OFFICE DODUC: Yes.

WITNESS PIRABAROOBAN: Okay. That would be the pile driving in the water. It would be considered in-water work, and we have restriction.

It will be done only during certain months. I

believe it's -- I don't know the exact times, but, like, two or three months from August to September, something like that.

We have restricted time for that work, plus we restrict it to perform that work from morning, 7:00 to 5:00 or 6:00 in the afternoon. It's not 24/7. It's not throughout the year.

MS. WOMACK: Okay. Because my past experience last March was coffer dam was pounded in and kept my tenants awake.

So is there differences in when -- when that's -- coffer dams are put in?

MR. MIZELL: Objection: Asked and answered.

WITNESS BEDNARSKI: I believe you may have been referring to the emergency repairs at the Clifton Court Forebay?

MS. WOMACK: At the dam? Yes.

WITNESS BEDNARSKI: Maybe that necessitated a 24-hour-a-day work. I -- I don't -- We don't have personal knowledge of that.

But as Mr. Pirabarooban stated, we have construction duration windows, both seasonal, and then we have daily restrictions on when the contractor can be working that's in the Final EIR/EIS, generally from 7:00 in the morning to 7:00 at night.

MS. WOMACK: Okay. So not 11:00 at night or -- Okay. Thank you.

I'd like to know -- I'd like -- I think I have the right number for the map that show the different locations.

So Exhibit SWRCB-102, Chapter 3, Mapbook Figures, and 3-4.

CO-HEARING OFFICE DODUC: Hold on, Miss Womack.

MS. WOMACK: Oh, I'm sorry.

CO-HEARING OFFICE DODUC: Let us try to keep up with you.

(Exhibit displayed on screen.)

MS. WOMACK: And I would like to focus on Western Canal, which I'm still seeing referred to as West Canal. It is Western Canal. I don't know -- I didn't get any change of name on my . . .

That's where my -- One of my water draws is from Western Canal. I guess that's why I'm a little bit . . . That's one of my water rights is on Western Canal. So it's -- You call it -- DWR has changed the name to West Canal, but I'd like to see where it -- the barge is going to be on West Canal, because that's mentioned.

MR. HUNT: Could you please repeat the figure

for us.

MS. WOMACK: Well, West Canal, it runs along the side -- along the eastern side of the Clifton Court Forebay.

This clearly doesn't show -- This is supposed to show where -- where this is. It's the -- It's the seven barge unloading facilities.

So could that get larger? Because that Western Canal -- You can see Clifton Court Forebay. You can see my farm directly underneath. I still can't see how I'm supposed to know where this is going to be.

(Exhibit displayed on screen.)

MS. WOMACK: Yeah. And it'll have to be even bigger because Western Canal is very tiny.

(Exhibit displayed on screen.)

MS. WOMACK: And you start to see Western Canal.

But where is -- Is this not the right material for where you're going to put the barge -- the seven barge -- temporary barge unloading facilities?

WITNESS BEDNARSKI: Can -- Can I ask: Is this SWRCB-102 and then Chapter 3, Mapbook Figures M3 through 4 that we cited in our testimony?

MS. WOMACK: I always have map problems.

WITNESS BEDNARSKI: That was the citation in

my testimony.

MS. WOMACK: I know. That's what I'm reading from.

CO-HEARING OFFICE DODUC: So let's find that citation.

(Exhibit displayed on screen.)

CO-HEARING OFFICER DODUC: Mr. Bednarski, what is that citation?

WITNESS BEDNARSKI: Mapbook Figures M3 through 4.

MR. MIZELL: There is a separate one for mapbooks. If you go back one.

(Exhibit displayed on screen.)

WITNESS BEDNARSKI: There we go.

I think it's probably that Sheet 11 down there will show that detail.

(Exhibit displayed on screen.)

WITNESS BEDNARSKI: There we go.

(Exhibit displayed on screen.)

WITNESS BEDNARSKI: Yeah. See if you can pull that up.

(Exhibit displayed on screen.)

WITNESS BEDNARSKI: Okay.

MS. WOMACK: Ah. Here we go.

Okay. And where exactly is that going to be,

the barge location?

WITNESS BEDNARSKI: Yeah. Can we zoom in a little bit so we may be able to see that in that crosshatched area in the sort of upper right there.

(Exhibit displayed on screen.)

WITNESS BEDNARSKI: Yeah. So you can see a -- a faint crosshatched area within the water. That is the proposed area for a barge landing.

MS. WOMACK: Isn't that -- That's actually -- That's actually the canal -- right? -- where the crosshatch it?

WITNESS BEDNARSKI: Yes. It's in the -- It's in the Western -- West Canal, Western Canal, that's -- that's right. And that would serve as our location to bring in material --

MS. WOMACK: So --

WITNESS BEDNARSKI: -- for the --

MS. WOMACK: -- 50-by-300 is your -- your size, and that's not going into -- This doesn't go into the canal that I -- I don't see the -- If that's the structure, I don't see it accounting for it going into the canal 50 feet-by-300.

WITNESS BEDNARSKI: Well, that light -- Can you see the light cross area that is just to the right of the white dashed line? It's in -- in the blue area.

MS. WOMACK: Yes.
WITNESS BEDNARSKI: That's what we're representing as the barge landing --
MS. WOMACK: But --
WITNESS BEDNARSKI: -- so --
MS. WOMACK: -- that's not -- That -- That is on the actual -- That -- The barge landing is on the actual bank.
WITNESS BEDNARSKI: Yes. As we mentioned in my testimony, for the purposes of the EIR/EIS, we are assuming that the barge landings will be constructed in the water with those dimensions that you cited, 50-by-300 feet, to utilize the most impactful footprint possibly for the FEIR/EIS, recognizing that the construction contractors, as they come on site, may use less impactful methodology than this.
So we --
MS. WOMACK: But --
WITNESS BEDNARSKI: We have tried to represent that in this figure.
I might caution: This is not an engineering drawing. It's just a mapbook, so taking dimensions off of this may or may not be that accurate.
MS. WOMACK: But -- But you just said it's in the water, but this -- this is on the bank. That --

That's the bank.

WITNESS BEDNARSKI: I --

MS. WOMACK: You can see where the bank is below -- below the crosshatch. There's the bank. It's a very narrow canal.

WITNESS BEDNARSKI: We have -- We have cited it in that whiter portion that's north of the -- of the narrow portion that I think you're referring to where the canal opens up a bit, if I might use that expression, and it's a bit wider. I -- I don't -- I'm not sure how else to better describe that.

MS. WOMACK: But -- Yes, I understand. But it clearly comes down into the canal where it's narrow and this is not allowing for it to go into the water by 50 feet.

WITNESS BEDNARSKI: Well --

MS. WOMACK: It's right along the bank, and you said it's along the bank. I mean, you said it's along the bank, and then you said it's in the water.

MR. MIZELL: Co-Hearing Officer Doduc, there's no question pending at this point. The questioner is simply badgering the witness with her own opinions.

CO-HEARING OFFICE DODUC: Miss Womack, it appears you have a disagreement with Mr. Bednarski regarding the figure that is before us.

Is there a specific question you have for him?

MS. WOMACK: Well, absolutely.

Having had three different times that we've had barges in, bringing in material to re-rock our levees, barges are large. They take a lot of room.

CO-HEARING OFFICE DODUC: And your question is?

MS. WOMACK: And my question is: How am I going to be able to go down this canal, Western Canal? How am I going to be able to go through that?

Because I don't see -- They're not allowing -- They're saying there's going to be a barge platform, which makes sense because they're going to have all these -- Unlike rock that you just plop down, this is going to take stuff to come off, so you're going to need something built it has to be into the water. The barge can't come straight up, you know.

It -- It -- You need room and I just don't see the room from -- This is a narrow, narrow canal and I don't see where anybody's going to be able to pass by.

I don't want to be surprised in the future.

CO-HEARING OFFICE DODUC: Mr. Bednarski, is there any light you can shed in terms of measures that are being contemplated to assure . . . that she will not be impeded?

WITNESS BEDNARSKI: Well, I -- I know that as part of the FERE (sic) -- FEIR/EIS and part of the Mitigation Monitoring and Reporting Program, we have a barge monitoring plan, a barge -- I guess it's called a . . .

WITNESS PIRABAROOBAN: Barge operations.

WITNESS BEDNARSKI: Barge Operations Plan that will be developed as we move into preliminary and final design. And so we'll be working closely with the entities in the area, including the Coast Guard, to make sure that any of our plans are in accordance with their regulations and the needs of the communities and the individuals that need to, you know, maintain passage through that area.

CO-HEARING OFFICE DODUC: So, at this time, given this stage of planning that you're in, what assurance -- what additional assurance are you able to provide Miss Womack in response to her question? Is there anything further you're able to add?

WITNESS BEDNARSKI: Beyond my testimony that we will be keeping more than half the channels open, that we will be working, again, with our -- our Barge Plan, as we develop that in preliminary design to ensure that traffic can continue -- water traffic can continue to pass through all of those areas as

necessary, and the -- the Plan has been documented in our -- in our Final EIR/EIS.

In fact, it's -- it's listed as SWRCB-111, and I believe that's available. And we'll continue to work with the -- the parties in the area to make sure that we don't obstruct.

CO-HEARING OFFICE DODUC: I believe that's all you're going to get from him.

MS. WOMACK: Oh, I had one more question.

CO-HEARING OFFICER DODUC: Okay.

MS. WOMACK: Are your barges all the same si -- What are the sizes of your barges you'll be using?

WITNESS BEDNARSKI: We don't have enough information at this time to determine that. It would depend on what materials were being delivered to each of the sites.

MS. WOMACK: So you're -- You're -- You're -- You're certain you're not going to block off even though you don't know the size of the -- of the barge.

MR. MIZELL: Objection: Asked and answered.

MS. WOMACK: Oh, goodness.

You don't know the size of the barges.

MR. MIZELL: Objection: Asked and answered.

CO-HEARING OFFICE DODUC: Sustained.

MS. WOMACK: Do you know the size of the barges?

CO-HEARING OFFICE DODUC: Miss Womack --

MR. MIZELL: Objection: Asked and answered.

MS. WOMACK: I'm just trying --

CO-HEARING OFFICER DODUC: Miss Womack --

MS. WOMACK: You know, this is going to impact me, and it -- it's sad.

Last -- Let's see. Last thing is your state-of-the-art fish screens.

Does the Tracy fish facility have a state-of-the-art fish screen?

MR. MIZELL: Objection: Outside the scope of this hearing.

We're not proposing a fish screen at Tracy Pumping Plant, which is a Federal facility, and what we're here to discuss is the California WaterFix.

MS. WOMACK: Do you have -- Do you have a state-of-the-art fish screen at the -- at the Clifton Court Forebay?

MR. MIZELL: Objection: It's also not part of this Project as described in our Petition or the documents we put in front of you, including the FEIR/EIS.

CO-HEARING OFFICE DODUC: So the answer is no.

MS. WOMACK: There is no state of the art. Okay. Because --

(Timer rings.)

MS. WOMACK: -- this is all about saving the fish, and this hearing is all about helping the fish.

And we don't have state-of-the-art screens at -- at -- at the Clifton Court Forebay Dam.

Thank you.

CO-HEARING OFFICE DODUC: Thank you.

Mr. Ferguson.

And I believe Mr. Ferguson is the last party to conduct cross-examination.

MR. FERGUSON: Good morning. Aaron Ferguson on behalf of County of Sacramento.

CROSS-EXAMINATION BY

MR. FERGUSON: Miss Buchholz --

CO-HEARING OFFICE DODUC: Mr. Ferguson, if you could identify the issues you'll be inquiring about.

MR. FERGUSON: Oh, excuse me.

I'm going to inquire about the scope of DWR's economics testimony; talk a little bit about Miss Buchholz's statements concerning statewide impacts, economic impacts; and then also talk about her statements related to the Project -- Project's benefits to agriculture.

CO-HEARING OFFICER DODUC: All right.

MR. FERGUSON: So, Miss Buchholz, your testimony includes the only discussion of economics in Petitioners' entire Part 2 case in chief; correct?

WITNESS BUCHHOLZ: I haven't read everybody's case in chiefs, so . . .

MR. FERGUSON: Well, what other case in chief testimony have you read that contains economics?

WITNESS BUCHHOLZ: None of the other ones that I have read have addressed economics.

MR. FERGUSON: Okay. You're not an expert in economics; correct?

WITNESS BUCHHOLZ: I am not an economist.

MR. FERGUSON: In other areas, DWR is presenting subject matter experts; correct?

WITNESS BUCHHOLZ: I'm presenting an overview of the Project Description.

MR. FERGUSON: But in other areas, for example, Mr. Bednarski's testimony, he -- he -- he's an expert on engineering construction-related issues.

For economics, DWR's not offering an expert in economics; correct?

WITNESS BUCHHOLZ: I'm -- As I said, I'm providing an overview of the Project Description based on information in this case for such economics based

upon the information in the Final EIR and Final EIR/EIS.

MR. FERGUSON: Okay. Are you familiar with DWR's economics analysis section?

WITNESS BUCHHOLZ: Section of . . .

MR. FERGUSON: Of the Department of Water Resources that evaluates economics issues for the Department.

WITNESS BUCHHOLZ: Oh, the staff in that section?

MR. FERGUSON: Yes.

WITNESS BUCHHOLZ: I'm aware of those -- those people.

MR. FERGUSON: Has the Economics Analysis Section analyzed the economics of WaterFix?

WITNESS BUCHHOLZ: I do not know.

MR. FERGUSON: DWR hasn't offered any testimony from folks in this section; correct?

WITNESS BUCHHOLZ: I do not --

MR. FERGUSON: The Economics Analysis Section; correct?

WITNESS BUCHHOLZ: I do not know.

MR. FERGUSON: So, in the past, DWR has hired consultants to look at the economics of WaterFix; correct?

WITNESS BUCHHOLZ: I do not know if DWR's hired consultants to look at that. I mean, as the EIR/EIS economists . . . prepared the socioeconomic sections of those -- of those documents.

MR. FERGUSON: Okay. Are you familiar with the Braddell Group and -- and Dr. Sunding's work with respect to economics in the WaterFix?

WITNESS BUCHHOLZ: I'm aware that he's done certain things. I have not read his work in total.

MR. FERGUSON: You haven't read his work. Okay.

And DWR hasn't submitted any of Dr. Sunding's work economics for -- as testimony in the WaterFix proceeding; correct?

WITNESS BUCHHOLZ: I do not know.

MR. FERGUSON: Do you happen to know whether Dr. Sunding's economics analysis . . . evaluates the economic impacts by looking at WaterFix as compared to the No-Action Alternative?

MR. MIZELL: Objection: Asked and answered.

She's indicated that she has not read it.

CO-HEARING OFFICE DODUC: Sustained.

MR. FERGUSON: So your testimony on economics mentions the benefits that, in your opinion, will rise to the Project; correct?

WITNESS BUCHHOLZ: Yes.
MR. FERGUSON: Okay. Would you agree that it's important to evaluate cost when considering economics of a Project?
MR. MIZELL: Objection: Vague as to what he means by "important."
CO-HEARING OFFICE DODUC: Oh, come on.
Overruled.
MR. FERGUSON: Your -- Thank you.
WITNESS BUCHHOLZ: My presentation of the economics benefits, as I said, was based upon the analysis that was completed for the EIR/EIS for socioeconomics section of the documents.
MR. FERGUSON: Let me try to ask the question a different way, because I think that was nonresponsive.
Would you agree -- You're -- You're being presented as the -- DWR's witness on economics; correct? We've established that.
WITNESS BUCHHOLZ: I'm being presented as the person presenting the overview of the Project Description.
MR. FERGUSON: Okay. Would you agree that it's important to evaluate Project costs when considering the economics of a Project?

WITNESS BUCHHOLZ: Not necessarily.

MR. FERGUSON: Why not?

WITNESS BUCHHOLZ: What we looked at in the socioeconomics was: How does it change the economy of the regions that were affected and was associated -- as -- as we presented in the -- in the socioeconomics chapters.

MR. FERGUSON: But to -- to -- to get to a net result on effects, don't you need to look at the costs as well in order to balance those out against the benefits?

MR. MIZELL: Objection: Asked and answered.

CO-HEARING OFFICE DODUC: Let's . . .

WITNESS BUCHHOLZ: The analysis --

CO-HEARING OFFICE DODUC: Recognizing that you're not an economist --

WITNESS BUCHHOLZ: Right.

CO-HEARING OFFICER DODUC: -- but you have some familiarity with economic analysis that is part of the CEQA process, please answer to the best of your ability.

WITNESS BUCHHOLZ: Right.

The -- The analysis is -- is associated with the economics -- regional economics analysis. Actual costs of the Project are certainly associated with

employment to construct and operate those facilities, and then both primary, secondary effects of that. But the actual cost of -- and -- and -- of the Project other than that link is -- we don't usually look at.

MR. FERGUSON: And -- And your testimony doesn't really mention those costs; does it?

WITNESS BUCHHOLZ: No.

MR. FERGUSON: Can we bring up Miss Buchholz's testimony at Page 13, please.

(Exhibit displayed on screen.)

MR. FERGUSON: I'm going to look at Lines 8 through 10 there.

(Exhibit displayed on screen.)

MR. FERGUSON: You indicate that (reading):

"Overall, implementation of CWF H3+ will improve . . . economics of the State of California."

Correct?

WITNESS BUCHHOLZ: Yes.

MR. FERGUSON: So how can you make this conclusion without any consideration of the costs of WaterFix?

WITNESS BUCHHOLZ: Because, again, we -- we looked at it from a -- looking at the socio -- socioeconomic impact analysis as presented in EIR/EIS,

which included the regions throughout the service area and the area that would be affected by construction.

MR. FERGUSON: But you didn't really evaluate that information or present it in your testimony; correct?

WITNESS BUCHHOLZ: No. This is based upon the information from the Final EIR and the Final EIR/EIS.

MR. FERGUSON: Okay. So all -- all your conclusions are -- are based on the data in the EIR socioeconomics section.

WITNESS BUCHHOLZ: Yes.

MR. FERGUSON: Okay. I'd like to look at Page 12 of Miss Buchholz's testimony.

(Exhibit displayed on screen.)

MR. FERGUSON: We looked at this passage yesterday a little bit, on Lines 25 and 26.

(Exhibit displayed on screen.)

MR. FERGUSON: You state that (reading):

"Without the (sic) implementation of CWF H3+, the negative economic impact of water export cutbacks could occur statewide."

So what -- In your opinion, what could cause the water export cutbacks that you describe?

WITNESS BUCHHOLZ: What we talked about in the document, under the No-Action Alternative as compared

to existing conditions, was primarily a change due to climate change and sea level rise that would affect the ability to . . . to continue to provide the same water supply reliability from existing conditions south of Delta as compared to -- under the No-Action Alternative.

MR. FERGUSON: So you didn't have in mind things like the Bay-Delta Water Quality Control Plan Update process?

WITNESS BUCHHOLZ: We talked about Bay-Delta Water Quality Control Plan Update as a cumulative impact because it's not been developed yet. So we don't have the de -- the definition of that. It's not reasonable and certain.

MR. FERGUSON: And then how about the big -- the reconsultation under the Federal Biological Opinions?

WITNESS BUCHHOLZ: As with the update, it hasn't been completed yet and would be speculative to include in any -- any specific analysis.

MR. FERGUSON: So what is your basis for stating there could be statewide negative economic impacts?

WITNESS BUCHHOLZ: Again, the results that were in the socioeconomics chapter of the Final EIR/EIS

and Final EIR.

MR. FERGUSON: Can you be more specific now? What -- You said -- You said there could be export cutbacks that's going to lead to statewide economic impacts.

Can you be more specific or provide some examples of how that would occur?

WITNESS BUCHHOLZ: I don't have the details in front of me right now, but in the document, what we do is, we analyze changes in water supply and thinking about the different places, whether it changes -- such as in south of Delta agricultural areas, whether it would change employment, and we -- we look at that change or in the change of . . . It's primarily the change -- We run it through a model called IMPLAN and that gives us our regional, statewide concepts.

MR. FERGUSON: Could the -- Could the regulatory processes that I -- that I mentioned in terms of Bay-Delta Water Quality Control Plan process, or the reconsultations, could those lead to export cutbacks even with the WaterFix?

WITNESS BUCHHOLZ: It would be speculative to decide exactly how they would affect water supply operations with or without the Project. However, as we said in cumulative impacts, that is a possibility.

MR. FERGUSON: Okay. So in -- Let -- Let me see if you can agree with this statement:

Would you agree that your statement that without implementation of the CWF H3+, the negative economic impact of export cutbacks would occur statewide?

Would you agree -- Would you agree that appears to imply that regulators could not or would not make determinations that would result in -- in reduction exports with WaterFix?

MR. MIZELL: Objection: Improper hypothetical; and asked and answered.

She's already explained how we don't assume the conclusions of those regulatory processes.

CO-HEARING OFFICE DODUC: Sustained.

MR. FERGUSON: Well, does your economic assessment consider the economic consequences associated with the potential reduction in exports caused by these various regulatory processes?

MR. MIZELL: Objection: Asked and answered.

CO-HEARING OFFICE DODUC: Sustained.

MR. FERGUSON: Okay. Can we go to Page 13 again?

(Exhibit displayed on screen.)

MR. FERGUSON: Lines 2 through 4.

(Exhibit displayed on screen.)
MR. FERGUSON: So at Lines 2 through 4, Miss Buchholz, you state that (reading):
"CWF H3+ will support more stable agricultural activities by enabling land use implementation and reducing risk associated with uncertain water deliveries."
You see that testimony?
WITNESS BUCHHOLZ: I do.
MR. FERGUSON: So are you suggesting -- With this statement -- I'm just trying to figure out exactly what you're saying.
Are you suggesting that the reduction in risk will occur because CWF H3+ will increase water deliveries to agricultural users?
WITNESS BUCHHOLZ: It will increase water supply reliability.
MR. FERGUSON: How will it do that? By increasing deliveries?
WITNESS BUCHHOLZ: It will -- I mean, it's . . .
When we talk about water supply reliability, it's -- it's because -- because CWF H3+ facilities provide more flexibility. It's more certain of how the water supply operations will occur in the future with

the changes that occur, especially like climate change and sea level rise. So that's where we take out the uncertainty.

MR. FERGUSON: So is there specific data you're looking at as it relates to water deliveries that allows you to draw this conclusion, though?

WITNESS BUCHHOLZ: We look at the results of the CalSim II modelings.

MR. FERGUSON: Like CWF H3+.

WITNESS BUCHHOLZ: Yes, versus No-Action Alternative.

MR. FERGUSON: And so when you -- Again, when you -- when you drew this conclusion, did you have water deliveries in mind as a -- as a factor that would reduce the risk for agricultural water users?

CO-HEARING OFFICE DODUC: Go ahead, Miss Ansley.

MS. ANSLEY: This is asked and answered.

He's retreading over ground. She explained operational flexibility. She explained what the Department looked at is CalSim water delivery model runs.

This is a question seeking the same answer basically.

CO-HEARING OFFICE DODUC: I would agree.

Sustained.

MR. FERGUSON: Okay. I apologize. I did not hear her say water deliveries, but . . .

WITNESS BUCHHOLZ: (Nodding head.)

MR. FERGUSON: So -- Fair enough.

Yesterday, Mr. Bezerra asked you some questions about Figure 14 from State Board 108 at Page 141. Do you recall that?

This was the figure that contained the CWF H3+ modeling results for CVP South-of-Delta deliveries.

WITNESS BUCHHOLZ: I don't remember which -- I don't want to comment --

MR. FERGUSON: Sure.

WITNESS BUCHHOLZ: -- when I don't have the --

MR. FERGUSON: Perhaps we can bring that up quickly. State Board 108 at Page 141.

(Exhibit displayed on screen.)

CO-HEARING OFFICE DODUC: Mr. Ferguson, you estimated 10. We've given you 15 already.

How much additional time do you need?

MR. FERGUSON: This will probably take another five -- five or 10 minutes.

CO-HEARING OFFICE DODUC: Let's give you five.

MR. FERGUSON: Okay. Do you recall this figure, Miss Buchholz?

WITNESS BUCHHOLZ: I see this figure, uh-huh.

MR. FERGUSON: So did -- Well, let's just refresh.

This -- This is Figure 14 from State Board 108, and this shows the modeling results for CVP South-of-Delta deliveries; correct?

WITNESS BUCHHOLZ: For the -- For the Biological Assessment.

MR. FERGUSON: Well, this is for CWF H3+; correct?

WITNESS BUCHHOLZ: It's for the Biological Assessment, yes, for CW -- The Biological Assessment for CWF -- CWF H3+, yes.

MR. FERGUSON: Okay. So the deliveries in Figure 14 include South-of-Delta agriculture contractor deliveries; correct?

WITNESS BUCHHOLZ: It includes all of the South-of-Delta deliveries.

MR. FERGUSON: Would that include agricultural contractor deliveries?

WITNESS BUCHHOLZ: It includes agricultural. It includes other deliveries, too.

MR. FERGUSON: Okay. Yesterday, you acknowledged that Figure 14 shows long-term average deliveries for South-of-Delta contractors would

actually decrease; correct?

WITNESS BUCHHOLZ: I acknowledged that the numbers are -- We believe the CalSim modeling output is similar for long-term average, and it's greater in -- in several of the other water year types.

MR. FERGUSON: Well, for the long-term average, which are the set of bars in the far left, would you acknowledge that when you compare the blue bar, which is the NAA, and the red bar, which is the CWF H3+, it shows a reduction of 6,000 acre-feet.

CO-HEARING OFFICE DODUC: Yes. We've been here, done that.

MR. FERGUSON: Right.

CO-HEARING OFFICE DODUC: What else are you needing from this, Mr. Ferguson?

MR. FERGUSON: So the CWF H3+ will not increase South-of-Delta deliveries on a long-term basis; correct?

WITNESS BUCHHOLZ: This was under the BA that was presented in the -- in the Final EIR/EIS in 2016.

MR. FERGUSON: This is from the developments document, isn't it, that was produced last July; right -- correct?

WITNESS BUCHHOLZ: I would have to look back and I don't have that -- I do have it in front of me

but I'd have to look forward to see how Figure 14 fits in.

But, as you can see from the -- from the legend, it refers to the BA modelings.

MR. FERGUSON: Well, let's get clarity:

Can we go back to Page 1, please, and make sure we're on the right document.

WITNESS BUCHHOLZ: No. I understand the document.

MR. FERGUSON: Okay.

WITNESS BUCHHOLZ: It's the right document. It has many things in that document.

MR. FERGUSON: Isn't this the test -- Isn't this the modeling results that Mr. Reyes has pointed to as the results for CWF H3+ in his testimony?

WITNESS BUCHHOLZ: I can't speak for Mr. Reyes' testimony.

MR. FERGUSON: So you're saying that you're not sure --

WITNESS BUCHHOLZ: I am not --

MR. FERGUSON: -- whether these results reflect the modeling results for CWF H3+.

WITNESS BUCHHOLZ: This is -- This question really needs to be answered by Mr. Reyes in Panel 2. This is not part of my testimony, and I'm not prepared

today to talk to you about it without further analysis.

MR. FERGUSON: But you -- You've drawn conclusions in your testimony with respect to reduction in risk to agricultural Water Contractors, and you stated that water delivery results from CWF H3+ are something you evaluated to draw that conclusion.

Did you evaluate this graphic, for example, in order to reach that conclusion?

WITNESS BUCHHOLZ: Actually, I -- I evaluated the numerical tables in the Final EIR and the Final -- in the Final EIR, and so I'm more used to using the tables as the model output when I prepared that te -- testimony.

MR. FERGUSON: So you -- you don't agree that this is CWF H3+ modeling results.

MR. MIZELL: Objection: Asked and answered at this point.

CO-HEARING OFFICE DODUC: Sustained.

MR. FERGUSON: Okay. Have you taken a look at the CWF H3+ delivery results for CVP South-of-Delta agricultural con -- excuse me -- State Water Project South of Delta agricultural contractors?

WITNESS BUCHHOLZ: When I prepared the testimony and other times, I've used the model results that's presented in the Final EIR for that, yes.

MR. FERGUSON: So would -- would you have a sense, roughly, what the long-term average delivery difference is for SWP South-of-Delta agricultural contractors?

WITNESS BUCHHOLZ: I don't --

MR. MIZELL: Objection.

WITNESS BUCHHOLZ: -- have those numbers --

CO-HEARING OFFICE DODUC: Hold on.

WITNESS BUCHHOLZ: -- off the top of my head.

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

Mr. Ferguson, Miss Buchholz's testimony was intended to provide an overview and just a synthesis of what was in the various documents.

You are getting into a level of detail that might be better served for the Operations Panel to come.

MR. FERGUSON: Respectfully, I disagree.

I mean, she's presented -- She established DWR's only testimony on economics. She has presented statements about how CWF H3+ will reduce the risk to agricultural Water Contractors. She suggested that water deliveries will do that. She must have evaluated some evidence in order to support these statements.

CO-HEARING OFFICE DODUC: My understanding, Miss Buchholz, was, you were simply providing an

overview and synthesizing the economic analysis that were in the various environmental documents.

WITNESS BUCHHOLZ: That is correct.

CO-HEARING OFFICE DODUC: You did not conduct any of those analysis.

WITNESS BUCHHOLZ: Not the socioeconomic analysis, no.

MS. MORRIS: Stephanie Morris, State Water Contractors.

I'd like to join the objection also.

This is pointing out the questions are separating CVP and SWP and it's talking about delivery, not exports.

The evidence as presented before the Board shows combined exports and there are a difference. And I think that the questioner is attempting to confuse modeling data in different Projects that this witness is not familiar with.

CO-HEARING OFFICE DODUC: Mr. Ferguson, I think she has been as cooperative as possible given her limitations in the areas of economic analysis.

I would encourage you to wrap up your line of questioning.

If you have arguments and objections that goes to the weight of evidence regarding her testimony,

especially that concerning the economic conclusion that she's reached, you may include that in your closing briefs.

MR. FERGUSON: Okay. I'll just move on to one more -- one more area of your testimony, and then I'll be finished.

So, your testimony said that CWF H3+ is the Project that DWR has adopted; correct?

WITNESS BUCHHOLZ: True.

MR. FERGUSON: So what do you mean by "adopted"?

WITNESS BUCHHOLZ: We adopted it through the issuance of the Notice of Determination in July of 2017.

MR. FERGUSON: Okay. And the CWF H3+ is a -- is a three-intake Project; correct?

WITNESS BUCHHOLZ: True.

MR. FERGUSON: So are you aware of the specific decision that triggered the preparation of a Supplemental EIR for the staged implementation of the WaterFix Project?

CO-HEARING OFFICE DODUC: I can hear the objections coming already.

Miss Ansley.

MS. ANSLEY: This was already tread over by

Mr. Obegi. Obviously, we're preparing objections.

It is our objection that this stuff is relevant to Part 2 per your ruling on February 21st, that this will be addressed, if necessary, in Part 3. And going certainly back, that she's already answered these very questions.

CO-HEARING OFFICE DODUC: And she's already answered yesterday that she was not aware.

MR. FERGUSON: Of a specific decision.

She was not aware of the documents with respect to the consulting contracts; correct?

MR. MIZELL: That's correct.

MR. FERGUSON: That's different that a specific decision that --

MR. MIZELL: The Department --

CO-HEARING OFFICE DODUC: Enough.

MR. MIZELL: -- has stated many times there's no decision.

CO-HEARING OFFICE DODUC: Enough. Enough.

MS. MORRIS: Stephanie Morris --

CO-HEARING OFFICER DODUC: Miss Morris.

MS. MORRIS: -- thank you -- on behalf of the State Water Contractors.

I think it's ambiguous as to the decision. It has been discussed ad nauseam.

There's a difference between exploring and discussing and making the decision informally versus a legally binding decision like you would have in a rod not (phonetic).

MR. FERGUSON: All right. That's all I have.

CO-HEARING OFFICE DODUC: Thank you, Mr. Ferguson.

Mr. Mizell, any redirect and, if so, on what particular topic do you wish to redirect?

MR. MIZELL: Yes, thank you. I have some very short questions on redirect.

CO-HEARING OFFICE DODUC: With respect to what topic?

MR. MIZELL: On the --

CO-HEARING OFFICER DODUC: I get to determine whether or not I'm allowing you to redirect, Mr. Mizell.

MR. MIZELL: Okay. I fully respect that.

For Miss Buchholz, I'd like to discuss whether or not the CWF H3+ Project falls within the Petition Project. This was something that was raised by Mr. Bezerra at the beginning yesterday.

I'd like to discuss whether or not CWF H3+ as petitioned includes the concept of adaptive management, which was also raised by numerous parties yesterday.

I'd like to talk to Mr. Bednarski about Mr. Jackson's critique of his expertise yesterday and whether or not he is capable of assessing the relative sizes of objects in the engineering -- in the Conceptual Engineering Report.

CO-HEARING OFFICE DODUC: You may proceed.

MR. MIZELL: Thank you.

REDIRECT EXAMINATION BY

MR. MIZELL: Miss Buchholz, isn't it true that CWF H3+ falls within the Alternative 4A as stated in the Petition, SWRCB-2 and SWRCB-2?

WITNESS BUCHHOLZ: Yes.

MR. MIZELL: Thank you.

Isn't it true that DWR is seeking a Permit for CWF H3+ which includes the adaptive management process?

WITNESS BUCHHOLZ: Yes.

MR. MIZELL: Thank you.

Mr. Bednarski, Mr. Jackson asked you about your expertise in navigation.

As an engineer, are you able to assess the relative sizes of structures in relation to the physical environment?

WITNESS BEDNARSKI: Yes, I am.

MR. MIZELL: And as an engineer, are you able to assess the relative sizes of structures in relation

to an average sized boat?

WITNESS BEDNARSKI: Yes, I am.

MR. MIZELL: If we could bring up DWR-1022 briefly.

(Exhibit displayed on screen.)

MR. MIZELL: Page 3.

(Exhibit displayed on screen.)

MR. MIZELL: Lines 12 through 24.

(Exhibit displayed on screen.)

MR. MIZELL: What engineering expertise or information are you relying upon in making the statements about potential impacts to navigation as questioned about on this paragraph?

WITNESS BEDNARSKI: I'm using my expertise to compare widths of river with widths of anticipated . . . intakes and projections of those features into the river, and comparing those to the amount of river width that is left after the temporary and permanent structures are installed in the river.

MR. MIZELL: Thank you.

That concludes my redirect.

CO-HEARING OFFICE DODUC: Thank you.

I will now open it up to recross rather than going group number by group number.

Does anyone wish to direct recross?

We'll begin with Miss Nikkel and --

MS. NIKKEL: Should I . . .

CO-HEARING OFFICE DODUC: Yes, please.

Miss Des Jardins, was that a yes?

MS. DES JARDINS: Yes.

CO-HEARING OFFICE DODUC: And I will remind you all that recross is limited to the scope of redirect.

MS. NIKKEL: Good morning. Meredith Nikkel on behalf of North Delta Water Agency, Group Number 9.

RECROSS-EXAMINATION

MS. NIKKEL: Miss Buchholz -- Buchholz, can you please explain what you mean by CWF H3+, quote, "falls within Alternative 4A"?

What does "falls within" mean?

WITNESS BUCHHOLZ: The range, as I understood the question, was in the application, we referenced Alternative 4A.

And in Part 1, we talked about the initial operating criteria 4A to H -- H3 to 4 -- H4 and the CWF -- CWF H3+ falls within that range, and it includes Alternative 4A with operating criteria H3+.

MS. NIKKEL: And how do you -- On what data do you base your opinion that it falls within the -- the range of operating criteria?

WITNESS BUCHHOLZ: I base it upon the description of the alternatives, as we presented them in the -- in the environmental documentation.

MS. NIKKEL: Can you specify which of the criteria you're basing that opinion on as you sit here today?

WITNESS BUCHHOLZ: That would be the operations criteria for South Delta exports, North Delta diversions criteria, spring Delta -- or all of the Delta Outflow Criteria, all of the water -- the water quality objective criteria as we described them in -- in the documentation.

MS. NIKKEL: And then you further testified that H3+, quote, "includes adaptive management."

So, again, what specific criteria are you referring to to base that opinion?

WITNESS BUCHHOLZ: Again, the description of -- of H3 -- of CWF H3+. And -- and our documentation from both the 2016 Final EIR/EIS and the 2017 Final EIR went into extensive descriptions of the adaptive management that is part of the Project Description and will be described in more detail by Dr. Earle in Panel 3 and -- in Panel 3.

MS. NIKKEL: So are you saying that the adaptive management criteria within H3+ is the same as

the adaptive management criteria that was included as Alternative 4A?

WITNESS BUCHHOLZ: What we're saying is, there wasn't an adaptive management criteria, that adaptive management framework was part of the Project Description and has been through many of the -- well, through the documentation.

MS. NIKKEL: Is it the same or is -- has it been changed in -- in H3+?

WITNESS BUCHHOLZ: There wasn't a criteria, per se. What the description of the adaptive management as we moved from -- through the different environmental documents has been expanded. And, again, Dr. Earle on Panel 3 will go into more detail in his testimony and his submissions.

MS. NIKKEL: So your opinion is based on testimony that Dr. Earle offered?

WITNESS BUCHHOLZ: My -- My opinion is based upon the information within the environmental documentation.

MS. NIKKEL: Thank you.

I have nothing further.

CO-HEARING OFFICE DODUC: Thank you, Miss Nikkel.

Miss Des Jardins followed by Miss Suard.

Sorry, Miss Suard. I'm just going by group number.

MS. DES JARDINS: Thank you very much.

Dierdre Des Jardins for California Water Research.

I would like to bring up the actual Petition, SWRCB-1, Page 6.

(Exhibit displayed on screen.)

MS. DES JARDINS: Can you put it at 100 percent, please?

(Exhibit displayed on screen.)

MS. DES JARDINS: 100 percent for -- Scroll?

(Exhibit displayed on screen.)

MS. DES JARDINS: Yeah.

And it says . . . This refers to Alternative 4A and it says (reading):

"Specific discussions of the components of Alternative 4A most relevant to the attached Water Rights Change Petition can be found within the partially Recirculated Draft EIR/Supplemental Draft EIS, at Sections 1.1, 1.1.4, 4.1, 4.1.2.2, 4.1.2.3 . . ."

And several other sections. I won't read them all.

And it gives a link to the Partially

Recirculated Draft EIR/Supplemental Draft EIS.

RECROSS-EXAMINATION BY

MS. DES JARDINS: Miss Buchholz, where within this description is the information that you're stating?

WITNESS BUCHHOLZ: That description in that paragraph refers to the facilities within Alternative 4A as -- which is talked about in the first couple sentences and the word "components". And those facilities have not changed since this document was prepared, as we said -- as I said already in my testimony.

MS. DES JARDINS: Let's look up at the top of the form. And it says (reading):

"Description of proposed changes or work remaining to . . . completed."

And it requests specific, including Project operational changes.

So this is the description of operational changes for the WaterFix Project that is in the submitted Petition application.

And I'm trying to find out where, in the submitted application, refers to the information that you're discussing.

MR. MIZELL: I'm going to object.

We have both no question pending, and when we did get a question, it has already been asked and answered.

MS. DES JARDINS: Oh, this has not been asked, respectfully, or --

CO-HEARING OFFICER DODUC: Miss --

MS. DES JARDINS: -- answered.

CO-HEARING OFFICE DODUC: Hold on.

Miss Buchholz, I think I understand what you just said, but let's repeat it one more time.

WITNESS BUCHHOLZ: You mean . . .

So --

CO-HEARING OFFICE DODUC: Miss Des Jardins, I believe, is trying to understand where CWF H3+ fits within this description of proposed changes that is in the Petition before us.

WITNESS BUCHHOLZ: Right.

And in that paragraph, we did talk about operational changes. And as we've talked about in this testimony, and I presented, that the operating criteria has been refined since this document was submitted to the State Water Resources Control Board.

I -- And we have moved from at that time under the Recirculated Draft EIR, Supplement Draft EIS. We presented that it was within Boundary 1 and Boundary 2,

and we had initial operating criteria of 4A H3, and 4A H4.

And I can bring up, again, my -- my graphic for that if necessary.

We've acknowledged that we refined that operations criteria in the Biological Assessment, in the 2016 Final EIR/EIS, and we subsequently refined it in the 2017 Final EIR based on the Biological Opinions and anticipated objectives for the Incidental Take Permit.

The specific paragraph in the blue box, the second paragraph is specifically to the facilities, and, as I stated in my testimony, those facilities have not changed since 2015.

CO-HEARING OFFICE DODUC: Thank you.

MS. DES JARDINS: Miss Buchholz, you describe a number of following documents, but I'm asking about what's in the actual Petition.

So none of the documents you described are in the Petition, nor has the Petition been amended; is that correct?

CO-HEARING OFFICE DODUC: I believe Miss Buchholz would disagree with that question.

WITNESS BUCHHOLZ: Right.

And that was the -- what I presented in my

testimony yesterday.

MS. DES JARDINS: But that was testimony; that wasn't the Petition.

This is a formal Petition that's submitted for the Board. It's a signed, sworn document that these are the proposed changes.

MR. MIZELL: Objection --

CO-HEARING OFFICE DODUC: Objection?

MR. MIZELL: Yes.

I'd like to suggest that at this point the questioner is providing testimony. She will have an opportunity in rebuttal to provide anything that she'd like to be responsive to what Miss Buchholz has answered here in cross-examination.

MS. DES JARDINS: I -- I just -- I want clarification about what's in the Petition and what is not in the Petition because --

CO-HEARING OFFICE DODUC: And you have asked the question, and Miss Buchhol -- Buchholz has answered it twice.

MS. DES JARDINS: Okay. Can we pull up DDJ-229, please, again.

(Exhibit displayed on screen.)

MS. DES JARDINS: Again, Miss Buchholz, this states -- This is an excerpt from the Final EIR/EIS,

and it says (reading):

". . . Actual operations will ultimately depend on the results of the adaptive management program."

So I'm trying to figure out why you're stating that it's within the -- within the Noticed Petition.

WITNESS BUCHHOLZ: May I ask to look at the footer on this document, please? Let me confirm the document.

(Exhibit displayed on screen.)

MS. DES JARDINS: This is the Final EIR/EIS.

WITNESS BUCHHOLZ: The 2016 Final EIR/EIS, yes.

MS. DES JARDINS: Yes.

CO-HEARING OFFICE DODUC: I'm not sure I understand the question, Miss Des Jardins.

MS. DES JARDINS: The question is: It says (reading):

". . . Actual operations will ultimately depend on the results of the adaptive management program."

I'm not sure -- You have testified that at -- that the results of the adaptive management program aren't known at this point; correct?

MR. MIZELL: Objection: That goes beyond the

scope of redirect.

What I asked was whether or not Alternative 4A is always included in adaptive management -- That actually misstates my own question.

I asked if --

CO-HEARING OFFICE DODUC: Lunch break after this.

MS. DES JARDINS: -- Alternative 4A includes the Adaptive Management Progress. It was not to go to what the results of the adaptive management process were -- are -- could be.

CO-HEARING OFFICE DODUC: Sustained.

MS. DES JARDINS: But she said that the -- that the H3+ was within the petitioned -- within the petitioned --

CO-HEARING OFFICE DODUC: Miss Des Jardins, I have sustained the objection.

MS. DES JARDINS: Okay.

CO-HEARING OFFICE DODUC: So move on to your next question.

MS. DES JARDINS: That's the extent of the questions.

Thank you.

CO-HEARING OFFICE DODUC: Miss Suard.

I will suggest, Mr. Mizell, after Miss Suard

concludes her recross, that we take a lunch break and not start with your Panel 2 until after lunch.

MR. MIZELL: (Nodding head.)

CO-HEARING OFFICE DODUC: Mr. Ferguson.

MR. FERGUSON: If possible, I have one question for Miss Buchholz, too, on recross.

CO-HEARING OFFICE DODUC: On recross.

MR. FERGUSON: Thank you.

MS. SUARD: I'm not sure if this is the appropriate time, but I wanted to correct the record of the date that I spoke about where I was at a meeting with Mr. Bednarski.

Can I do that?

CO-HEARING OFFICE DODUC: That was not in the scope of redirect.

MS. SUARD: Okay. Can I send a letter correcting that date so I have the correct date on the record? I mean, it's substantial. It was December 6th, 2017.

CO-HEARING OFFICER DODUC: All right. So --

MS. SUARD: Because I had a reference to the documents as well.

CO-HEARING OFFICE DODUC: So noted.

Now, ask your recross questions.

MS. SUARD: No. That's it. Thank you.

CO-HEARING OFFICE DODUC: I desperately need a lunch break.

(Laughter.)

CO-HEARING OFFICE DODUC: Mr. Ferguson, you're standing between me and a lunch break.

MR. FERGUSON: I feel the same way.

Aaron Ferguson, County of Sacramento.

RECROSS-EXAMINATION BY

MR. FERGUSON: Miss Buchholz, just real quickly.

The response I just heard to Ms. Nikkel's question about H3 -- what components of H3+, if you will, fall within the range of Alternative 4A.

I heard you say that operations criteria for South Delta exports, North Delta diversions, Delta Outflow Criteria, water quality criteria, you indicated that those are all parameters that fall within 4A when we're talking about H3+.

How about upstream storage and changes in upstream storage? Would those conditions fall within the range?

WITNESS BUCHHOLZ: Absolutely. And I used those as examples, as I stated in my statement.

So we have -- If you -- As we present in the -- the Final EIR/EIS, all of the environmental

documents, we have numerous factors that we analyze in comparative manner, including upstream storage, river flows, operational criteria.

And those are just examples. I wasn't making an exhaustive list.

MR. FERGUSON: Okay. Thank you.

CO-HEARING OFFICE DODUC: Thank you, Mr. Ferguson.

And I believe that that concludes this panel.

Thank you.

(Panel 2 excused.)

CO-HEARING OFFICER DODUC: Before we take a lunch break, though, I -- I do have a question for Mr. Mizell.

Yesterday, Mr. Mizell, Mr. Bezerra voiced some objection to testimony from your witnesses, and at that time, I did not ask you for a response to that objection.

Are you prepared to give me that response now?

MR. MIZELL: I can give it to you now or after lunch, your -- your preference.

CO-HEARING OFFICE DODUC: Let's give it to me now so we can consider that over the lunch break.

MR. MIZELL: Certainly.

So, the basis of Mr. Reyes' testimony

originally stems out of the statements of what the key issues are for Part 2 that the Hearing Officers may put in your rulings.

We made most reliance upon the August 31st, 2017, ruling in which you state the issues within the scope of Part 2 are inclusive of: Will the CWF unreasonably affect fish and wildlife or recreational uses for public trust resources, and is the CWF in the public interest?

As Mr. Ferguson just finished questioning Miss Buchholz about, he dwelled on the testimony that we have related to the public interest, and that relied upon the development of material for the maintenance of supply reliability through -- to the South-of-Delta contractors.

In your September 29th, 2017, ruling granting the motion for Grasslands Water District to revise its NOA after -- Notice of Intent to Appear, after the deadline in order to participate fully in Part 2.

The justification voiced by Grasslands at that time was that the California WaterFix participation approach allegedly presented by Reclamation would allow Water Contractors who fund construction of the California WaterFix to receive a corollary water supply.

And Grasslands alleges that South-of-Delta allocations would be changed, and based upon that, they allege potential harm to fish and wildlife.

The Hearing Officers granted this motion.

So we believe the water supply allocations, not to the issue of whether or not they are legal injury, but whether or not they affect fish and wildlife or the public interest are components of Part 2.

And, lastly, as discussed in the issues for Part 2, the Hearing Officers are going to consider the appropriate Delta Outflow Criteria, and this is done in the context of competing beneficial uses of water.

It's the Department 's belief -- and we prepared testimony based upon this -- that the consideration of deliveries to contractors both north and south of the Delta needs to weigh into that balancing as to what is -- constitutes reasonable Delta Flow Criteria.

I'm prepared to go through each of the citations Mr. Bezerra provided, but I -- as a general matter, I can streamline it by simply saying that you will find each and every one of those citations either goes to water allocation deliveries as it relates to North-of-Delta/South-of-Delta contractors which, again,

impacts both the public interest and fish and wildlife, as well as cold water pool storage and end-of-September/end-of-May storage levels, which, again, is a -- an impact to -- or, no -- a criteria that has the potential to influence fish and wildlife resources.

If you would prefer, rather than me listing out each and every citation, I can submit a more detailed discussion of each citation to you in writing or I can simply list them for the record here.

CO-HEARING OFFICE DODUC: Let's not do that. I think you've given us enough to consider during our lunch break.

If we determine that we need more information, we will so inform you after we resume.

MR. MIZELL: Thank you very much.

CO-HEARING OFFICER DODUC: All right. With that, I feel the need for a long lunch break.

Let's resume at 1 p.m.

Oh, Miss Nikkel snuck in before I could.

MS. NIKKEL: If I could just ask a clarifying question of Mr. Mizell.

I -- I heard him state that appropriate flow criteria includes the analysis of competing uses of water, or something like that.

Mr. Mizell -- I'm curious if Mr. Mizell has authority for that other than the Delta Reform Act.

MR. MIZELL: Yes. I was using language that was used in the Hearing Officers' rulings, both October 31st, as well as a number of other rulings that I don't have the dates of.

But it's -- Each time that the a issues for Part 2 are listed, that's the language used by the Hearing Officers.

CO-HEARING OFFICE DODUC: Tossing our words back at us. Very smart.

MS. NIKKEL: Thank you.

CO-HEARING OFFICE DODUC: Thank you.

With that, we will resume at 1 p.m.

(Lunch recess at 11:44 a.m.)

* * *

Friday, February 23, 2018 1:00 p.m.

PROCEEDINGS

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CO-HEARING OFFICE DODUC: Good afternoon.

I'm not on. Hello? Am I on?

Now I'm on.

All right. I hope everybody had a nice long lunch. That will not happen often.

It is 1 o'clock. We are resuming.

And let's do a couple housekeeping items before we get started.

First of all, I would like to rule on the objection Mr. Bezerra voiced yesterday to -- Actually, the motion -- I'm sorry -- the motion to strike portions of testimony by Mr. Reyes in DWR-1016, related slides in his presentation, DWR-1028, and related figures in DWR-1069.

And he moved to strike on the grounds that the testimony exhibits are beyond the scope of Part 2 of the hearing.

This motion to strike is overruled. The testimony and exhibits in question compare deliveries to SWP and CVP contractors under the CWF H3+ scenario to the BA H3+, H3 and H4 operational scenarios, and the No-Action Alternative.

The purpose of the testimony is to explain how refinements to spring Delta outflow falls -- and falls South Delta OMR and exports restrictions impacted modeling results for various operating parameters, including deliveries to SWP and CVP contractors.

As stated in our procedural ruling of October 7, 2016, Part 1 of this hearing addressed whether the proposed changes in points of diversion would cause injury to any legal user of water.

Part 1 did not address whether approval of the Petition would benefit any legal user, whether disapproval of the Petition would injure any legal user, or the effects on water deliveries of any operational limitations that might be imposed as conditions of approval.

These questions are within the scope of Part 2 as relevant to our consideration of the public interest.

In addition, river flows, upstream storage, deliveries to wildlife refuges and, in some instances, deliveries to agricultural contractors are relevant to our consideration of impacts to recreation and fish and wildlife.

Therefore, the testimony and exhibits are properly within the scope of Part 2.

We remind parties that cross-examination and rebuttal during Part 2 is the proper time to address any Part 1 issues that may be raised by this testimony or the exhibits.

All right. Miss Nikkel.

MS. NIKKEL: Miss Nikkel -- Meredith Nikkel on behalf of Group 7, Sacramento Valley Water Users.

If I could just ask a point of clarification.

Based on that ruling, would DWR's testimony that was the subject of the Motion to Strike be limited to use for the purposes described by your ruling?

CO-HEARING OFFICE DODUC: Was DWR intending to use it for other purposes?

MS. NIKKEL: I don't know.

CO-HEARING OFFICE DODUC: Yes, it is limited to what I just read.

MS. NIKKEL: Thank you.

CO-HEARING OFFICE DODUC: Mr. Mizell, could you give us an estimate on the time it will take for your Panel 2 to provide their direct testimony? I'm sorry, and Miss Aufdemberge, too.

MR. MIZELL: Certainly.

So, we have the revised Panel 2. Under our NOI, it was listed as 240 minutes, which is four hours.

With the movement of Dr. Earle to Panel 3, we

will be moving, I believe, about 40 minutes to Panel 3, but with the addition of Mr. Miller, we came back at essentially about the same amount of time.

So I would -- I would guess we're going to be right around the four-hour timeframe for Panel 2.

CO-HEARING OFFICE DODUC: Hmm. Okay.

Mr. Jackson, do you have a question?

MR. JACKSON: I do.

CO-HEARING OFFICE DODUC: Hang on. I don't think your microscope is on.

MR. JACKSON: Yes, I do.

This question is basically for all of the folks who are watching the Webcast rather than coming today --

CO-HEARING OFFICER DODUC: Um-hmm.

MR. JACKSON: -- who are worried about whether or not cross-examination will begin today.

CO-HEARING OFFICE DODUC: That is exactly what I am trying to ascertain, Mr. Jackson. Given --

MR. JACKSON: I'd like to beg that it not -- the cross not start until Monday, if that's possible.

CO-HEARING OFFICE DODUC: Mr. Jackson, I'm always happy when I can accommodate your requests.

In that case, Mr. Mizell, we will not be starting cross-examination of your witnesses until

Monday.

And . . . And we will have your final witness for this panel there on Monday as well.

MR. MIZELL: That's correct.

CO-HEARING OFFICER DODUC: Okay. I would like to break today no later than 4:30. So it's possible that we may not get through all of your testimony today, which is fine, because we will be continuing on Monday with Dr. --

I've forgotten.

MR. MIZELL: Ohlendorf.

CO-HEARING OFFICER DODUC: -- Ohlendorf -- thank you -- anyway. All right?

MR. MIZELL: Very good.

CO-HEARING OFFICE DODUC: Miss Morris, did you have a question?

MS. MORRIS: In the event that we finish and there's time before 4:30, I do have a very short cross-examination. I think I am the first person.

So, if we have time, and it's sufficient, I wouldn't mind proceeding with my cross-examination, if we --

CO-HEARING OFFICE DODUC: Yeah. If I heard correctly, Mr. Mizell was estimating four hours, which will take us to past 5 o'clock.

But if you would like to accommodate Miss Morris and shorten your testimony . . .

MR. MIZELL: Our -- Our witnesses will strive to be precise.

CO-HEARING OFFICE DODUC: Now, they have -- They have important information to convey to us, so I don't wish them to be short only to -- Not that it's not important, Miss Morris, but only to meet Miss Morris' request.

MR. MIZELL: Very good.

CO-HEARING OFFICER DODUC: All right. With that, let me ask all of you to stand and raise your right hands.

MARIN GREENWOOD,
RICHARD WILDER,
TARA SMITH,
ERIK REYES,
MICHAEL BRYAN,
MARIANNE GUERIN,
EN-CHING HSU,
KRISTIN WHITE,
AARON MILLER and
NANCY PARKER,
called as witnesses by the Petitioners, having been duly sworn, were examined and testified as follows:

CO-HEARING OFFICE DODUC: Thank you.

Please begin.

MR. MIZELL: Thank you.

So Panel 2 you have before you today are a collection of experts for the biologic -- the aquatic biology, as well as modeling operations, water quality, and temperature modeling. I think that covers everybody.

Again, the terrestrial biology and the adaptive management process details will be on Panel 3.

DIRECT EXAMINATION

MR. MIZELL: Dr. Greenwood, I'm going to ask -- I'm going to ask each of you guys a couple of questions about your Statement of Qualifications and your testimony.

Dr. Greenwood, is DWR-1001 a true and correct copy of your Statement of Qualifications?

WITNESS GREENWOOD: Yes, it is.

MR. MIZELL: Is DWR-1012 a true and correct copy of your testimony?

WITNESS GREENWOOD: Yes, it is.

MR. MIZELL: Thank you.

Dr. Wilder, is DWR-1002 a true and correct copy of your Statement of Qualifications?

WITNESS WILDER: Yes, it is.

MR. MIZELL: And is DWR-1013 signed a true and correct copy of your testimony?

WITNESS WILDER: Yes, it is.

MR. MIZELL: Miss Smith, is DWR-1009 a true and correct copy of your Revised Statement of Qualifications?

WITNESS SMITH: Yes, it is.

MR. MIZELL: Is DWR-1015 a true and correct copy of your testimony?

WITNESS SMITH: Yes, it is.

CO-HEARING OFFICE DODUC: Mr. Reyes, is DWR-27 a true and correct copy of your Statement of Qualifications?

WITNESS REYES: Yes, it is.

MR. MIZELL: Is DWR-1016 a true and correct copy of your testimony?

WITNESS REYES: Yes, it is.

MR. MIZELL: Dr. Bryan, is DWR-33 a true and correct copy of your Statement of Qualifications?

WITNESS BRYAN: Yes, it is.

MR. MIZELL: Is DWR-1017 a true and correct copy of your testimony.

WITNESS BRYAN: Yes, it is.

MR. MIZELL: Dr. Preece, is DWR-16 a true and correct copy of your Statement of Qualifications?

WITNESS PREECE: Yes, it is.

MR. MIZELL: Is DWR-1018 a true and correct copy of your testimony?

WITNESS PREECE: Yes, it is.

MR. MIZELL: Dr. Guerin, is DWR-1005 a true and correct copy of your Statement of Qualifications?

WITNESS GUERIN: Yes, it is.

MR. MIZELL: Is DWR-1020 a true and correct copy of your testimony?

WITNESS GUERIN: Yes, it is.

MR. MIZELL: Dr. Hsu, is DWR-1006 a true and correct copy of your Statement of Qualifications?

WITNESS HSU: Yes, it is.

MR. MIZELL: Is your microphone on?

WITNESS HSU: Oh, yes.

Yes, it is.

MR. MIZELL: Make sure it's close to you.

Is DWR-1021 a correct copy of your testimony?

WITNESS HSU: Yes, it is.

MR. MIZELL: Miss White, is DOI-41 a true and correct copy of your Statement of Qualifications?

WITNESS WHITE: Yes, it is.

MR. MIZELL: And is DOI-40 a true and correct copy of your testimony?

WITNESS WHITE: Yes, it is.

MR. MIZELL: Mr. Miller, is DWR-1000 a true and correct copy of your Statement of Qualifications?

WITNESS MILLER: Yes, it is.

MR. MIZELL: Is DWR-1011 a true and correct copy of your testimony?

WITNESS MILLER: Yes, it is.

MR. MIZELL: Miss Parker, is DOI-35 a true and true and correct copy of your Statement of Qualifications?

WITNESS PARKER: Yes, it is.

MR. MIZELL: And is DOI-39 a true and correct copy of your testimony?

WITNESS PARKER: Yes, it is.

MR. MIZELL: Thank you very much, all of you.

What I intend to do is introduce the first speaker and what they will do to transition this -- the oral presentation between themselves. That way, you don't have to listen to attorneys more than necessary.

And with that, I'll turn it over to Dr. Greenwood.

WITNESS GREENWOOD: Good afternoon. My name is Marin Greenwood. I'm an aquatic ecologist with ICF here in Sacramento.

Well, I've worked for just over nine years on a number of planning, permitting and research projects within the Delta.

I'm a certified fisheries professional with the American Fishery Society, and I have a Bachelor of Science degree, a Master of Science degree, and a Ph.D. from several universities in the United Kingdom.

I began work on what was bid as the Conservation Plan at that time in 2011. And my -- my primary role was as aquatic ecologist that was responsible for much of the effects analysis for the draft BDCP.

I've also worked on the Environmental Impact Report, Environmental Impact Statement. And I've served as Lead Fish Biologist for the endangered species act Biological Assessment and Incidental Take Permit Application for California WaterFix.

If you could, please, Mr. Hunt, pull up my PowerPoint, DWR-1029.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: I'll be giving a summary of my written testimony today regarding the topic of effects on fish within the Delta.

By "Delta," I'm meaning not just the legal Delta but also adjacent areas, such as Suisun Bay and Suisun Marsh.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: My testimony -- I'll have an introduction in my testimony, my summary today, and I'll discuss my opinions regarding reasonable protection of Delta Smelt and Longfin Smelt followed by my opinions regarding reasonable protection of salmonids and green sturgeon. And then, finally, other primarily fish species that were covered under the Bay Delta Conservation Plan, as other -- as well as other aquatic species of primary management concern that were

addressed in the EIR/EIS.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: So the -- the testimony that I'm summarizing today was based on a number of different -- My -- My opinions are based on a number of different sources, including California WaterFix, Final EIR/EIS, which I'll just refer to as FEIR/S, the Biological Assessment, BA, the Incidental Take Permit Application, ITP Application under CESA, California Endangered Species Act.

The Biological Opinions, or BOs, issued by the Fish and Wildlife Service and National Marine Fisheries Service, the Incidental Take Permit issued by the California Department Fish and Wildlife, ITP, and others as I reference in my written testimony.

I would like to note regarding the Biological Assessment that are referenced in my written testimony.

In my written testimony, all of the cross-references are to SWRCB-104, whereas, in fact, my written testimony is intended to refer to the updated BA, which is DWR-1142.

In many cases, the page references are the same. In some cases, they may differ but I just wanted to make that clarification.

And effects analyses, upon which I'm basing my opinions, reflected extensive collaboration, review and feedback provided by Department fish agencies, so Fish and Wildlife Service, National Marines Fisheries, Department of Fish and Wildlife, as well as Department of Water Resources and Reclamation.

Before moving into the next part of my own PowerPoint, I'd like to revisit, please, Mr. Hunt, DWR-1008, Slide 4, from Miss Buchholz. This is to set some context for what I'm going to be discussing my -- in my summary testimony today.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: This list was shown yesterday from Miss Buchholz and -- it illustrates -- it illustrates the information of operations criteria to the Final CWF H3+. I'll be referring to CWF H3+ today and that is -- that is the focus, obviously, of what I'm talking about.

But much of the modeling that I'll be referring to isn't of CWF H3+ itself, as far as biological modeling. It's informed -- My opinions are informed by the BA H3+ modeling scenario as well as to some extent by H3 and H4.

However, it's my opinion that these -- these other scenarios, while not CWF H3+, are reasonably

representative of CWF H3+ itself.

And I'd like to now pull up, Mr. Hunt, SWRCB-108, just to provide a couple of illustrations of why I think that they're reasonably comparable.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: So in that document, please, Page 149.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: I'm going to show a couple of pages of graphs that have this basic format to them.

These are monthly average flows downstream of the North Delta diversions in the Sacramento River.

The blue lines represent the No-Action Alternative as analyzed in the Biological Assessment.

The green lines represent the BA H3+ modeling scenario, which is labeled there as "CWF BA PA_ELT," which I will try not to repeat. I'm hoping you remember it's BA H3+.

And, finally, the red line labeled "Revised 4A" is CWF H3+.

So what I'd like you to pay particular attention to with these graphs is that the red line and the green line are very close to each other. There's very little difference between those.

The differences that you may be able to

discern are, for example, in the month of March, and I would say an above-normal and below-normal years-in, where the green line representing BA H3+ is slightly below the red line representing CWF H3+.

The next -- The next graph I'd like you to pull up, please, Mr. Hunt, is Page 151.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: And this next series of graphs is representing Old and Middle River flows, which is an important indicator of potential entrainment risk as well as to South-of-Delta export facilities.

Here you will see somewhat larger differences than on the previous graph I showed, again, with the main differences being in the month of March, you can see there that the red line representing CWF H3+ is generally above the green line representing BA H3+. This is as a result of the additional Spring Outflow Criteria that Miss Buchholz mentioned yesterday.

And then also in the month of October, where the red line representing CWF H3+ is somewhat below the green line representing the BA H3+, but this is -- but still greater than the blue line representing the No-Action Alternative.

There are differences there, but the -- the

general trend in the differences being greater than the -- the No-Action Alternative which forms the basis for my opinion that the BA H3+ is still a reasonable representation of potential effects of CWF H3+.

The final example I'd like to provide is for Delta outflow and that's on Page 152, Mr. Hunt, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: Again, the same colored lines represent -- representing the same scenarios. And, again, the most obvious things that you'll see there are the months of March and the months of October.

So under CWF H3+, Delta outflow is somewhat greater than it is under the BA H3+ outflow scenario, and then -- sorry -- in the month -- yeah, the month of March. And then in the month of October, the Delta outflow under the red line CWF H3+ is somewhat less than the green line but similar to the No-Action Alternative.

So I -- I provided these graphs just as some basis to illustrate that. I believe, although there are differences, that the CWF H3+ scenario's reasonably represented by the BA H3+ which forms the bulk of our biological modeling, which is what I'm basing my opinions, largely but not entirely on, but largely.

Moving back, please, to my own PowerPoint, DWR-1029.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: There are many biological models that were used in the text analyses for CWF H3+.

As with the models in general, I think this -- I think I remembered hearing this in Part 1 of these hearings. These aren't meant to produce absolute predictions. They are ultimately derived from operations modeling, various physical models, and so they are most appropriately viewed as comparisons of different scenarios.

In some cases, the same potential effect was analyzed with multiple models; for example, through-Delta survival of juvenile Salmon from the Sacramento River Basin.

Several models were used, and, therefore, in those situations, the weight of evidence from different models was considered to come up with a conclusion regarding a particular -- a particular effect.

And as has been noted already in these hearings, and will be, I'm sure, noted again, modeling has limited ability to capture real-time operational

decisions, which particularly in the case of fish, aquatic resources is a very important consideration given that operational decisions are triggered by -- often are triggered by or made based upon real-time assessment of fish distributions within the Delta or adjacent areas through the Delta.

Mr. -- Mr. Hunt, if you could, please, pull up briefly DWR-1028. This is Mr. Reyes' testimony. I'm stealing his last-slide thunder a little bit here, just to illustrate the overall context --

(Exhibit displayed on screen.)

WITNESS GREENWOOD: -- for where our biological modeling fits in. This just reiterates a little bit the point I made in this.

You can see there's a box there that gives some examples of fisheries models. These aren't by no means all of the fisheries models that we have, that we've considered, but these are some examples.

And the important point I'm trying to get across is that these models are fed by various other models. Some of them are fed directly by CalSim, others are fed by, for example, hydrodynamic modeling from DSM-II Hydro.

Ultimately, they're coming from the operations modeling. And as I mentioned, there is limited ability

to capture real-time operational decisions in these models.

So after that introduction, I'd like to return back to my PowerPoint, please, Slide 5, just to give an overview next of my opinions regarding visible protection of CWF H3+ --

(Exhibit displayed on screen.)

WITNESS GREENWOOD: -- for fish.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: Firstly, regarding the Smelts.

It's my opinion that Delta Smelt and Longfin Smelt will be reasonably protected by CWF H3+, firstly because the effects of construction will be avoided, minimized and mitigated.

Secondly, because the existing protection from South Delta entrainment risk will be maintained and potentially increased because of the construction and operation of the North Delta diversions, as I'll discuss.

Thirdly, the North Delta diversions will be screened to fish agency protective standards and there will also be habitat restoration undertaken to mitigate the potential for a restricted access to upstream areas

for the Smelts, which I'll discuss more in a couple of slides.

Next, Delta Smelt fall rearing habitat will be reasonably protected in my opinion, because of the inclusion of the fall outflow or Fall X2 criteria from the Fish and Wildlife Service Biological Opinion currently in place.

Next, it's my opinion that Longfin Smelt will be reasonably protected by DWF H3+ through the inclusion of Spring Outflow Criteria developed in coordination with the Department of Fish and Wildlife as part of the ITP Application process, Permit issuance.

And, finally, it's my opinion that other Delta habitat changes which are of particular relevance to Delta Smelt, being a species occurring within the Bay-Delta throughout its life. These changes will be limited or mitigated, in my opinion; therefore, reasonably protecting Delta Smelt.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: Slide 7 itself pertains to Salmonids and Green Sturgeon and follows a similar structure to Shortfin Smelts.

Firstly, it's my opinion that the Salmonids

and Green Sturgeon will be reasonably protected because construction effects will be avoided, minimized and mitigated.

Such Delta entrainment risk will be -- The protection from South Delta entrainment risk will be maintained or potentially increased above the existing levels.

The North Delta diversions will be screened to fish agency protective standards, and there will be a number of pre- and post-construction studies which will be used to . . . to develop the final design of the facilities in order to be protective of Salmonids and Green Sturgeon and other species, as well as post-construction studies that will be used to assess the effects once they're built and operated in order to assess the need for any adaptive management decisions to be made regarding the evidence for any effects that are in place after the operations begin.

It's my opinion that at Head of Old River Gate that will be constructed and operated will reasonably protect San Joaquin River Basin Salmonids.

And it's also my opinion that these species will be reasonably protected through the limitation or mitigation of potential changes in habitat suitability. And I'll provide more detail on in a few slides.

And, finally, most of my -- most of the discussion really focuses on listed -- listed species, so listed Salmonids and Green Sturgeon. But it's my opinion also that unlisted Salmonids and Pacific Salmon essential fish habitat within the Delta will also be reasonably protected.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: And then regarding the other species that I mentioned covered by BDCP as well as other aquatic species of primary management concern, these all being considered in the EIR/EIS, it's my opinion that generally these will be reasonably protected as well by CWF H3+.

Moving on to the next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: So the first section I'd like to describe my opinions on is for Delta Smelt and Longfin Smelt.

Next slide.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: And just to reiterate the topics that I'm going to be summarizing today regarding my opinions for reasonable protection relating -- relating to construction, South Delta entrainment,

North Delta diversions, fall rearing habitat for Delta Smelt, spring outflow for Longfin Smelt and then, finally, other habitat effects in particular focused on Delta Smelt.

Next slide, at least.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: My first opinion regarding the Smelt is that they will be reasonably protected by CWF H3+ because construction effects will be avoided, minimized and mitigated.

I'd actually like to speak to the second bullet first. And that is that there's little spatial overlap with the areas of construction at any time of the year.

So the Smelts do occur in these areas, but they are generally downstream. The main range is downstream of where these areas are and, therefore, there's little potential for spatial overlap, but it -- it could occur.

And then the actual -- The primary protective measure that will be in place is for in-water work windows to be employed. That's the first bullet. That basically is meaning that the in-water work that will occur is during the summer and early fall, which is a period where, during the early part of that, there may

be some overlap, temporal overlap, of these species but, in general, they're be expected to be downstream and, therefore, there will be little potential.

But there will still be potential for overlap and, therefore, there are a number of environmental commitments, avoidance minimization measures and conservation measures, that will be place to limit the potential for effect.

My written testimony cross-references the appendix in the EIR/EIS that actually has all of those listed. It's a little cumbersome to show today, so I was hoping just as an -- just as an illustration of the types of things we're talking about, Mr. Hunt, if you could pull up DWR-1142, Page 68, of that .pdf, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: This is just an example -- Oh, doesn't seem like the right one.

The one I was hoping to see is the -- the BA Chapter 3, the updated BA Chapter 3, DWR -- I believe it's DWR-11 -- 1142.

MR. MIZELL: Yes. 1142. I think we're on 1042.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: This is the revised BA Chapter 3.

And if you could go to Page 68 --

(Exhibit displayed on screen.)

WITNESS GREENWOOD: -- which will show just a few examples of the -- just a few examples of the types of avoidance and minimization measures.

This -- This -- This example I'm showing here -- if you could scroll down towards the bottom -- is actually for the Head of Old River Gate.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: But these are the types of measures that will be in place at all of the construction sites as necessary.

So I'm not going to list all those or describe them. I don't think I even could.

But, for example, the fish -- fish AMM8, Fish Rescue and Salvage Plan. This is if you're -- if you're enclosing an area and dewatering it, it's basically rescuing the fish and putting them back into the main waterway.

Other examples, for example, Underwater Sound Control and Abatement Plan is essentially for underwater noise, which could be potentially injurious to -- to fish.

So it's my opinion that with -- And if you can return to my PowerPoint, please. Thanks.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: It's my opinion that with these measures -- and there are many of them -- in place, that the Smelts and indeed the other species will be reasonably protected, as I'll mention in my discussion of those other species.

There will be loss of habitat because of the construction of the facilities. The footprints of the facilities will occupy habitat that otherwise fish could occupy, and so there will be shallow water and tidal habitat restoration of 1,828 acres, approximately, which will be to offset the loss of habitat. And that restoration must occur prior to the loss of habitat taking place.

I should add that the 1,828 acres that I have on the slide here is not just for footprint loss. It also includes potential operational effects from the -- the restricted passage, which I'll discuss in a couple of slides.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: Moving on to Slide 12.

So my second opinion regarding the Smelts is that they will be reasonably protected because the protection from South Delta entrainment risk under

CWF H3+ will be maintained or potentially increased from the existing levels.

The CWF H3+ operational criteria includes the protective Old and Middle River flow criteria from the 2008-2009 Fish and Wildlife Service and National Marine Fisheries Service Biological Opinions.

And, then, with the construction and operation of the North Delta diversions, there will be less South Delta pumping which, therefore, has the potential to reduce entrainment.

Given -- As I mentioned before, given the things like South Delta entrainment are managed in real-time. I've emphasized the word "potential" there because, under the current operations just in the South-of-Delta export facilities, there is a management and protection occurring for -- for these species, of course, and, therefore, that -- that will continue and that would continue with implementation of CWF H3+.

And so, although we have modeling data, modeling to suggest reductions in entrainment are possible based purely on the modeling. Of course, real-time operational decision-making is -- is important as well.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: These two graphs here are from the Fish and Wildlife Service Biological Opinion for CW -- California WaterFix.

I -- I show them here just to illustrate some of the basis for my opinion regarding reasonable protection from South Delta entrainment risk.

This is pertaining to Delta Smelt, and it's showing -- From the CalSim simulation that was done for the BA and Biological Opinion, it shows the number of months within those two time periods. So the left group is from December to March, which is the adult upstream migration period, and the right graph is from March to June, which is the larval and juvenile transport of Delta Smelt moving back upstream.

There are two thresholds shown on the horizontal axis, -2,000 cfs and -5,000 cfs, Old and Middle River flows.

Those are -- Those are different thresholds included in the Biological Opinion that were used to illustrate protection.

When Old and Middle River flows are below -5,000 cfs, the risk for entrainment considerably increases, as has been shown from historic data. And that is something that's included in the -- the existing criteria in the Biological Opinion.

This shows that, based on looking at -5,000 cfs, the number of months within those time periods over the entire 82-year period that was modeled is the same for the No-Action Alternative and as well as -- This is PDA. The red is PA, which is referring in this case to the BA H3+ modeling scenario.

The Biological Opinion by Fish and Wildlife Service also included the -2,000 cfs and described it as an indicator below which entrainment risk increases, as well as Sacramento River water entering the Central Delta is -- is moved more rapidly towards the South Delta and, therefore, an indicator of entrainment risk.

The number of months meeting that threshold, as you can see here, is slightly greater or somewhat greater under PA, which represents CWF H3+, which, based purely on this monitoring, indicates that there are more months meeting this protective threshold. This is the number of months where it's -2,000 cfs or more.

But, as I mentioned, real-time operational decisions mean that we have to think also just beyond the -- the -- these basic summaries of the modeling. However, based just on the modeling, there is the potential for greater protection.

This is for Delta Smelt, as I mentioned. The

similar thinking forms my opinion regarding Longfin Smelt also being reasonably protected.

If you could move to the next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: As I mentioned, I consider also Longfin Smelt to be reasonably protected, but we do have some modeling results that suggest the potential for a greater negative effect under CWF H3+ than under the No-Action Alternative. And I'd like to just spend a moment discussing those.

If you could pull up, please, Mr. Hunt, DWR-1036. This is Appendix 4A. Page 55.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: This analysis was included in the ITP Application. This is from the ITP Application, Appendix 4A.

And it is -- It is an analysis where the salvage of juvenile Longfin Smelt during April to May is predicted as a function of Old and Middle River flows, average Old and Middle River flows.

The table illustrates the predicted salvage under the No-Action Alternative as well as PP. In this case, "PP" is Proposed Project, which is simply the -- the ITP Application nomenclature, and the modeling scenario, again, is BA H3+.

The final column shows the differences between those two scenarios. Where the differences are negative, this suggests less entrainment under CWF H3+, or the Proposed Project as it's shown here.

Where the numbers are positive and suggest more salvage, meaning more entrainment, under -- again, under the Proposed Project.

This -- This, then, based purely on this modeling, suggest a greater potential for entrainment of Longfin Smelt. However, this modeling is only considering the -- the mean, on average, Old and Middle River flow in April to May.

This doesn't mean the South Delta exports are greater under CWF H3+ than under the No-Action Alternative.

I'd like to just show you -- show you the mechanism involved here.

So if you could, please, move to Page 59 of the same document, Appendix 4A.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: The mechanism, in fact, is the -- with the modeling assuming Head of Old River Gate that was closed 50 percent of the time in those months, the Head of Old River Gate affects the amount of flow entering Old River from the San Joaquin River

which, therefore, affects Old and Middle River flows that are the -- that are the predictor of entrainment risk in the table I just showed you.

This graph here is illustrating the South Delta exports. Under the blue line is the No-Action Alternative; the PP is the Proposed Project; and then the green line is the difference between them.

And you can see here that the green line Proposed Project minus No-Action Alternative is generally at zero or below the zero, indicating South Delta exports are similar or lower under the Proposed Project, under CWF H3+.

There are a couple of months where they're higher, but only a couple of months.

If you could also move to Page 62 in that same .pdf to illustrate May.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: In May, there are no -- there are no months over the whole 82-year series where South Delta exports are greater, as you can see by the green line, generally being at zero or below the zero.

The point I'm making with this -- if you could return to my PowerPoint --

(Exhibit displayed on screen.)

WITNESS GREENWOOD: The results that I showed

in that table, the prediction of salvage as a function of April and May Old River flow, are because of the operation -- the assumption of the operation of the Head of Old River Gate.

As I mentioned, real-time operations are undertaken. Real-time operations are undertaken to limit the risk of entrainment. Factors such as -- such as the Head of Old River Gate, as well as South Delta exports, will be considered in order to be protective of the species and, therefore, it's my opinion that, although we have these modeling results, that the -- the real-time operations will -- will have enabled the reasonable protection of these -- of Longfin Smelt and Delta Smelt.

My next opinion -- Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: Next opinion is regarding reasonable protection of the Smelts, Longfin Smelt and Delta Smelt, from the effects of the North Delta diversions.

The second bullet down there, again, emphasizes that the North Delta diversions are upstream of the main range of where the Smelts occur, as I mentioned, for the construction. And so by . . . By that fact, the potential effects are limited as far as

entrainment, for example.

But for those Smelts that are occurring in that area, the North Delta diversions will be designed to fish agency protective standards, as we -- I think you already heard some discussion yesterday.

The 1.75-millimeter opening, that's actually a standard for juvenile Chinook Salmon that I'll discuss in a few slides when I get on to that section of my summary.

That opening, based on analyses, would prevent entrainment of Smelts that are greater than about 21 to 22 millimeters.

The .2 feet per second approach velocity is Fish and Wildlife Service-recommended criterion to be protective of Delta Smelt in order to limit screen contact injury potential, as I have noted on that sub-bullet.

And then there will be a number of -- a suite of pre- and post-construction studies, as I mentioned earlier, that will be intending to reduce some of the uncertainty regarding the potential effects of these -- of the screens.

And I'll talk more to these studies during the Salmonid/Green Sturgeon section of my summary today.

It's recognized that there is the potential

for movement upstream -- to upstream areas, upstream of the North Delta diversion. This recognizes there is a potential for this passage to be potentially restricted by the North Delta diversions.

If you could pull up, please, SWRCB-105.

This is the Fish and Wildlife Service Biological Opinion.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: And Page 320, please -- oh, sorry -- 345 of the .pdf.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: This diagram, which as I mentioned is from the Fish and Wildlife Service Biological Opinion.

If you could maybe make it just a little smaller just so we see the legend.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: Thanks.

It's conceptually illustrating the potential effect that the North -- the construction of the North Delta diversions would have on the habitat in that part of the Sacramento River.

The upper diagram there is showing -- The arrows represent relative velocities, channel velocities. And what they are showing is that the --

the velocity in the middle or close to the middle of the channel is relatively high compared to near -- nearer the riverbanks. So the riverbanks have lower-velocity habitat.

This is important because studies have shown that Delta Smelt use what's called -- I guess it's called tidal surfing to move upstream. So to move to -- Adults, when they're moving upstream before spawning essentially surf on floodtides to move up -- to move upstream.

In that Reach of the river, which Delta Smelt do occur in, that ability to tidally surf would be generally present and, therefore, the hypothesis in the Bio -- Biological Opinion is that Smelt -- And I should note the -- those relatively high velocities in the channel are above the swimming ability of Delta Smelt. And so it's hypothesized in the Biological Opinion that they are using the margins. So they're using those lower-velocity areas near the bank to -- to move upstream in that area.

Now, with the construction -- On the lower diagram there that you see, with the construction of the fish screens, that -- in the vicinity of those fish screens are where the fish screens will be built, that lower-velocity habitat will be eliminated because the

fish screens are intended to have relatively rapid sweeping velocities in order to meet downstream passage criteria for juvenile Salmonids in that stream.

And so Delta Smelt trying to move past -- The analysis are included in our BA and Biological Opinions show that -- that the potential for passage is greatly reduced with -- if attempting to move along one of those screen faces because of the relative -- relatively high velocities.

And so it may be possible for Delta Smelt to move to the other side of the riverbank and use that lower velocity, although there may be lower velocities indeed in the other channel wall, for example.

But the argument -- hypothesis in the -- in the -- the Biological Opinion is that there could be an effect because the river is essentially bending a number of -- There are a number of riverbends moving upstream, and the fact that there are three intakes, it's felt in the Biological Opinion that Smelt will have a chance of encountering at least one, potentially more, of those intakes.

And so it's -- it's recognized that the passage upstream -- And Delta Smelt do occur upstream near the North Delta diversions. It's recognized that that passage could be restricted by the presence of

these screens.

If you could turn back to my PowerPoint, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: So the last bullet there, as I mentioned, that potential passage restriction, it's my opinion that there'll be reasonable protection from the passage restriction because there'll be about 1750 acres of habitat provided as mitigation downstream of the North Delta diversions in order to account for the increase that potentially wouldn't be accessible upstream of the North Delta diversions.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: Moving on, then.

My next opinion is regarding the protection of Delta Smelt fall rearing habitats.

My -- It's my opinion that CWF H3+ reasonably protects Delta Smelt fall rearing habitat because it includes the Fall X2 criteria from the Fish and Wildlife Service 2008 Biological Opinion.

Our analyses have shown that the abiotic rearing habitat extent in the fall is similar under the No-Action Alternative and the CWF. This is analysis included in the Biological Assessment, BA.

Now, the Fish and Wildlife Service Biological Opinion also included an analysis of rearing habitat beyond just the spring and summer -- sorry -- beyond just the fall. The fall has been, obviously, a lot focused since the implementation of the 2008 Biological Opinion.

But, as I mentioned, the Biological Opinion for CWF H -- CWF, California WaterFix, includes analysis of spring and summer rearing habitat. And that -- that analysis illustrated the potential for a reduction in rearing habitat during the summer, and particularly the month of August, because of the less Delta outflow that was modeled at that time.

There is the -- Given that there has been a lot focused on fall and there's less known -- less information regarding marine habitat in the summertime, the Adaptive Management Program for CWF will address the uncertainty in the summer rearing habitat of Delta Smelt in order to provide operations that will be protective at the time the operations actually begin of CWF.

And I would note also, as I do in my written testimony, that there are -- there are other processes as well that will be addressing the issue of summer outflow, for example, under the Delta Smelt resiliency

strategy.

Assessment -- provision and assessment of additional summer outflows is something that has been proposed, and also that the -- the 2008-2009 Biological Opinion reconsultation as well may be considering outflow during these other times of the year.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: So it's my opinion that Longfin Smelt will be reasonably protected by CWF H3+ because of the inclusion of Spring Outflow Criteria that, as I mentioned earlier, were developed in coordination with the Department of Fish and Wildlife through the Incidental Take Permit Application process.

There is a positive relationship between winter/spring Delta outflow, actually expressed as X2, and abundance indices of Longfin Smelt.

The table at the bottom is taken from the Incidental Take Permit Application Appendix.

Actually, it's not taken from the Appendix. That one there is actually taken from Chapter 4.

And this is, I believe, our only analysis that actually is of the CWF H3+ modeling scenario.

And what it shows is, these are predicted indices of abundance, following -- following the

control survey, and this is abundance for Longfin Smelt as a function of mean January to June X2.

The yellow highlighted box shows that, with the Proposed Project -- which as I mentioned in this case was actually CWF H3+ modeled -- that there will be little difference between the No-Action Alternative and the Proposed Project, which in my opinion indicates reasonable protection of Longfin Smelt.

I should add -- And I was intending to lay this out early on in my presentation. The way I'm assessing reasonable protection, in case you were wondering, is . . . Essentially what we're doing is comparing these scenarios to a baseline that includes the Biological Opinions, National Marine Fisheries Service and U.S. Fish and Wildlife Service 2008-2009 Biological Opinions, which essentially are meeting standards for Endangered Species Act, as well as the criteria from the Bay-Delta Water Quality Control Plan under D-1641.

This is what is -- This is what's captured in the modeling that you see here. Obviously, not the real-time management and these things, but just the overall modeling of the operational criteria.

So, I should have mentioned that earlier. But that's -- that's -- that's basically how I'm assessing

reasonable protection -- the evidence for reasonable protection.

Moving on to my next slide, 18.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: This is my final slide for the Smelts. And these are various factors that were examined in relation to Delta Smelt, things that were thought to be of potential effects that could arise from CWF H3+.

It's my opinion that Delta Smelt will be reasonably protected because these Delta habitat changes will be either limited or elsewhere there -- there is the potential for effect, the effects will be mitigated.

The first one is water temperature. An assessment was done of the water temperature effects using DSM-II QUAL model. And this showed that there'll be little difference between the CWF H3+ and the No-Action Alternative, the main driver on water temperature within the Delta being the atmospheric conditions, rather than water operations.

The second factor looked at was turbidity. CWF H3+ has the potential to influence turbidity, which is an important component of Delta Smelt habitat, by entraining sediment of the North Delta diversions.

It's my opinion that Delta Smelt will be reasonably protected because a Sediment Reintroduction Plan to mitigate sediment entrainment at the North Delta diversions, essentially returning sediment to the Delta.

There is a potential for microcystis to be affected by the operations of CWF H3+. For example, through less South Delta export pumping in the summertime.

Dr. Bryan, who's on our panel, provided testimony in Part 1 regarding this issue and has testimony again regarding this issue for Part 2, which indicates little potential for effect.

Selenium was assessed in the Biological Opinion, the potential for selenium bioaccumulation because of changes in South Delta exports. And this illustrated, based on the modeling, that there was little potential for effect as well.

And then, finally, the Biological Opinion/Biological Assessment also looked at the potential for entrainment of food web materials by the North Delta diversions. This is essentially the trimming of phyto -- phytoplankton carbon performing the base of the Delta Smelt food web.

The quantitative -- The quantitative

analyses -- analysis suggested that the percentages would be low. And also it was discussed qualitatively that the entrainment of the North Delta diversions had the potential to offset or perhaps even more than offset by the in situ productions or the production of these materials within the Delta, as well as South Delta export pumping being reduced and, therefore, allowing a greater potential contribution from the San Joaquin River, which is relatively rich in those types of materials compared to other parts of the Delta, like the Sacramento River.

That concludes my summary testimony regarding the Smelts.

Next, I'd like to move to Salmonids and Green Sturgeon.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: And the next slide again, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: This is an overview of my topics. It's similar structure to the Smelts that I've just discussed.

I'll be speaking to my opinions regarding reasonable protection from construction, South Delta entrainment, North Delta diversions, Head of Old River

Gate, habitat suitability effects and then, finally, for unlisted Salmonids and Pacific Salmon essential fish habitat.

Most of what I'm describing is really focusing on or thinking about listed Salmonids. These are the focus of our Endangered Species Act and California Endangered Species Act analyses.

But I also considered the -- the unlisted Salmonids to be reasonably protected as well, and so I was going to speak to that.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: As I mentioned for the Smelts, the primary protective measure which I consider will contribute to the reasonable protection from construction effects is the use of in-water work windows, summer/early fall in -- work windows, that will enable much of the potential occurrence of these species in these areas to be not overlapping with construction activities.

However, in the case of Salmonids and Green Sturgeon, there is potential, I would say, for more overlap than with the Smelts.

Steelhead adults moving upstream in the early fall, as well as Green Sturgeon juveniles which occur

year-round -- kind of year-round in the Delta, mean that the various environmental commitments, avoidance, minimization, conservation measures that I briefly outlined there will be particularly important for those species.

And then, as I mentioned for the Smelts, the -- the loss of habitat because of the footprint of the facilities is something that will be offset through habitat restoration.

And in the case of the Salmonids and Green Sturgeon, that -- that will consist of tidal perennial habitat of just almost 155 acres, and then also channel margin habitat restoration for the footprint of the North Delta diversions.

The 4-point -- I should note the 4.3 miles I have up there on the slide also accounts for operational effects, which I'll be speaking to in a few slides.

And as I emphasized for the Smelts, the -- the habitat restoration to offset these losses will occur prior to the losses of habitat occurring.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: This is regarding -- My opinion is similar for -- to the opinion I had for

Smelts, that the CWF H3+ will be reasonably protective of Salmonids and Green Sturgeon because it will maintain or potentially increase entrainment protection from South Delta entrainment.

Again, as I mentioned for the Smelts, the Old and Middle River flow criteria will be in place from the 2008-2009 Biological Opinions, and with the construction and operation of the North Delta diversions, this will give less South Delta pumping and, therefore, the potential for less entrainment, recognizing that that is something that is managed in real-time.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: It's my opinion that Salmonids and Green Sturgeon will be reasonably protected from the North Delta diversion effects because of the screening, as well as the -- the numerous pre- and post-construction studies that will be undertaken to inform the final design, as well as to assess the effects following operation -- testing and operation of these intakes, North Delta diversions.

As I mentioned earlier for Smelts, the North Delta diversions will be screened to fish agency standards. The opening of 1.75 millimeters is a

Salmonid fry standard and, therefore, we expected, based on the sizes of fish, to all -- you know, essentially all by eliminate entrainment risk of fish, which actually could be called out of the water column by the -- the diversions.

The approach velocity, as I mentioned, is .2 feet per second. This is a, as I mentioned, Fish and Wildlife Service-recommended criterion for Delta Smelt and is more protective than the .33 feet per second standard for juvenile Salmonids, Salmonid fry, from NMFS, National Marine Fisheries Service.

And the sweeping velocity for the screens is required to be at least two times the approach velocity. This is a standard from Department of Fish and Wildlife and it is -- it is intended to limit the potential passage time that it takes for juvenile Salmonids to move downstream past the screens.

These screens are large, and there's three of them. There is uncertainty regarding the potential for effect from the screens.

I shouldn't say there's uncertainty regarding the potential for effect. There is the potential for effect, but a number of pre- and post-construction studies will be undertaken, as I'll describe in a -- in a moment, that will reduce the uncertainty and that

effect by informing the final design to be as protective as possible, but also allowing assessment of the screens once they are constructed and operated in order to -- to assess what effects they're actually having once being -- once being built and operated.

The next slide is from the --

(Exhibit displayed on screen.)

WITNESS GREENWOOD: -- couple of tables to illustrate uncertainty.

I was in two minds whether to have this slide or not, but I think it's useful to illustrate some of the uncertainty and the sorts of effects that these screens may have.

This is taken from the National Marine Fisheries Service Biological Opinion for California WaterFix.

It assesses the -- Or it -- it illustrates the -- the probability of there not being effects from the screens based on, for example, entrainment risk. So entrainment being fish actually being pulled through the screens and removed from the water column, as well as the potential for what -- what -- the probability of injury from the screens and then taking into account one intake versus three intakes.

There's uncertainty in -- I'm -- I'm showing

this to illustrate the uncertainty and the potential effects that there may be from the facilities.

The top table illustrates the potential effects if 50 percent of the juvenile Salmonids migrating past the intakes actually were to encounter the screens, meaning to be right at the screen face.

The lower table illustrates the same information but showing 25 percent or 33 percent of the juvenile Salmonids moving downstream.

The left-hand column pertains to the different species that are being discussed. WRCS, for example, is winter-run Chinook Salmon, then the spring-run, fall-run, late fall-run and, finally, Steelhead.

The probability of entrainment is in relation to the sizes of the fish. Could they pass through the screen openings?

And then the probability of injury is -- is from NMFS's assessment of the literature. And these are illustrative -- I would note that these are illustrative based on NMFS's literature review, as I said, and, to some extent, our -- I guess kind of more towards the worse case based on the literature that was reviewed.

But, as I mentioned, this is un -- there is uncertainty. And part of this is to illustrate the

types of uncertainty, 50 percent, 25 percent, 33 percent. There is uncertainty.

And so the next slide --

(Exhibit displayed on screen.)

WITNESS GREENWOOD: -- doesn't show up well on this -- on the screen. I'm not sure if it's good on your monitors.

It's good? Okay.

Then -- It's not good on my little sheet of paper but . . .

This is -- This illustrates the pre- and post-construction studies that are required to be undertaken, that will be undertaken under CWF H3+ implementation.

The left-hand table shows the pre-construction studies. These are the studies to inform the final design as well as to establish baseline conditions against which post-construction studies can then be compared.

So the first nine studies that you see in each of the tables are really -- they are general studies informing the general design of the screens or else the assessment of the screen performance after the -- in the post-construction phase.

Studies 10 to 16 are studies that are more

species-specific with particular focus on the Salmonids and I've -- in white I've highlighted the Smelts. I spoke of the Smelts earlier.

But these are -- these are to illustrate that, for example, an important component of CWF H3+ is to establish what baseline survival rates are through the Delta and also through the Reach where the North Delta diversions will be located, and then to compare after construction and operation what the survival is through that Reach and through the Delta in order to assess whether performance standards are being met for the Project and whether there is need for adaptive management actions given those performance standards.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: It's my opinion that the Salmonids and Green Sturgeon will be reasonably protected by the North Delta diversion Bypass Flow Criteria, real-time operational adjustments, as well as mitigation that will be undertaken.

Bypass Flow Criteria are essentially the amount of water that can be diverted based on the amount of flow that's in the river.

And there's also protection of, for example, pulses of fish moving into -- It's recognized that fish

move into the Delta in pulses which are associated with large pulses of flow and, therefore, there are criteria to protect those pulses of -- of fish, for example, by limiting the amount of diversion to minimal -- to minimal amounts.

It's recognized that there is a potential for effects at the diversions as well as downstream of the diversions.

The last bullet there speaks to a couple of the potential effects, so less flow -- less flow in the river, potentially longer travel time and, therefore, reduced survival, as well as the predation losses at the North Delta diversions.

And one of these -- these far field effects is changed hydrodynamics at the junction with Georgiana Slough, which is an important entry point into the -- the interior Delta where survival -- where such studies have shown that survival is less of juvenile Salmonids migrating through the Delta.

And so, as mentioned yesterday, a non-physical barrier will be installed at Georgiana Slough at the entrance to Georgiana Slough.

This is -- There are different types of non-physical barriers. The ones that will be most successful in pile testing at that location have been a

combination of light -- flashing strobe lights and sand deterrent in a -- in a bubble curtain, which, as I mentioned, is -- is to mitigate the potential effects of the North Delta diversions.

It's noted in the -- in the Biological Assessment that it's anticipated that the -- the potential hydrodynamic effect at the Georgiana Slough junction, meaning the potentially greater tidal influence because of less Sacramento River flow coming downstream of the North Delta diversions.

With the tidal habitat restoration that will be undertaken that I mentioned for Delta Smelt, as well as other tidal habitat restoration that's being undertaken in the Delta as a result of the 2008 Biological Opinion, it's -- it's anticipated that the -- that potential effect should not be great.

But there is a performance standard essentially that the frequency of regressing flows should not increase above the baseline levels. This is another thing that will be looked at and assessed, and, therefore, similar to adaptive management.

If there's a potential need, for example, for more tidal habitat restoration, to draw tidal energy away from that junction, that that would also be a consideration for the adaptive management just as an

example.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: Moving to the South Delta, it's my opinion that the Head of Old River Gate that will be constructed and operated will reasonably protect San Joaquin River Basin Salmonids.

The primary purpose of that gate will be to keep juvenile Salmonids from the San Joaquin River Basin in the main stem Sacramento River and also San Joaquin river flow in the main stem of the San Joaquin River in order to increase the potential for survivals through the Delta.

Studies in the past have shown that survival and flow are important in the San Joaquin River, although I should note there's -- in some recent years, has been less evidence for the San Joaquin River pathway being better than the Old River pathway. That's something that is -- that will -- that has been studied, will continue to be studied.

It's my opinion that through operation of this gate, there will be reasonable protection of these juvenile Salmonids.

There'll be an interagency technical team that will be charged with assisting in the design of the

Head of Old River Gate in order to limit the potential for predation at the -- at the structure itself with -- In multistructures such as that there's always the risk of potentially creating predator habitat that could increase predation risk. And I should add that interagency technical teams are an important component of CWF H3+.

There's an interagency technical team for the North Delta diversions. There's an interagency technical team for Clifton Court Forebay water locations. There's an interagency technical team for barge operations as well.

So, even though that -- that framework with these teams informing final design as well as, you know, facilitating assessment and adaptive management I think is a very important component and that contributes to my opinion regarding reasonable protection.

The Head of Old -- Moving back to Head of Old River Gate. It -- It will also reasonably protect upstream migrating adult Salmonids through, as I mentioned, increased -- maintaining or increasing -- keeping more flow in the San Joaquin River in order to maintain fall dissolved oxygen in the San Joaquin River area, particularly near Stockton.

Finally, then -- Sorry.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: It's my opinion that there will be reasonable protection because potential changes in habitat stability from CWF H3+ will be limited or mitigated and, therefore, will protect Salmonids and Green Sturgeon.

The North Delta diversion operations have the potential to reduce the inundation of bench habitats in the North Delta.

These are habitats that have been created during back protection actions in order to provide particularly rearing habitat for juvenile Salmonids, and they're intended to be inundated during somewhat higher flows. But with the North Delta diversions being operational, our analyses show that there's a potential for these to be inundated less often.

Recognizing that potential effect, a total of 4.3 miles of channel margin will be restored in order to, as I say, mitigate that potential reduced inundation.

The 4.3 miles, as I mentioned earlier, includes not just this which is an operational effect but also the footprint effect from loss of habitat at

the North Delta diversions.

As I mentioned for the Smelts, the DSM-II QUAL analysis that was done to assess water temperature showed little difference between the No-Action Alternative and the Project, atmospheric conditions being the main driver of water temperature differences.

The selenium analysis, which Dr. Ohlendorf can speak to more of the details of, I believe, next -- next week when he testifies. He'll be testifying about that model.

Selenium analysis showed that changes in selenium by accumulation in Salmonids and Green Sturgeon will be less than significant.

And we also assessed the potential for effects of CWF H3+ on upstream migration. This is basically looking at the -- the percentage of water from the Sacramento River or San Joaquin River, Mokelumne River at the -- in the Western Delta, basically as an indicator of changes in these olfactory cues for upstream migration. And the changes were shown to be less than significant.

And, finally, for Sturgeon, we included in the Biological Assessment, the EIR/EIS, an assessment of the potential effects on Sturgeon year class strength. And this is actually -- The analysis is done for White

Sturgeon because there are sufficient White Sturgeon that are caught in order to form a year class index from drawing in -- in the Bay-Delta.

And there's a statistical relationship with the Delta outflow in the spring -- primarily spring Delta outflow. And this showed that the H3+ and the No-Action Alternative were similar. There wasn't a difference because of the similarity in spring outflow, which, in my opinion, indicates reasonable protection of types and size. The Green Sturgeon may be similarly affected as White Sturgeon.

Just to acknowledge in my final sub-bullet there that there is uncertainty in this relationship regarding if it's, in fact, Delta outflow, Delta inflow, Sacramento flows. Those are joined -- obviously correlated themselves.

But that uncertainty will be reduced from investigation prior to operations in order to have operations that are protective for those species.

As I mentioned earlier . . . my -- Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: As I mentioned earlier, the focus of my summary testimony and my written testimony is largely on the listed -- listed species.

However, obviously, fall -- unlisted Salmonids are very important as well, and fall -- fall and -- for example, being economically important for commercial fishing, recreational fishing.

And these were -- These were considered in the NMFS Biological Opinion for several reasons. One is as the pre-base for listed Southern Resident Killer Whale.

Secondly, because these -- these unlisted fish often are the ones most studied and, therefore, provide useful surrogate information for listed Salmonids, and also to inform the NMFS's own essential fish habitat analysis.

So, many of the same issues are important for listed -- these listed -- unlisted Salmonids as for listed Salmonids and, therefore, will be inadequate methods that will be used for generally the same.

And so as my -- Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: It's my opinion that these unlisted Salmonids and Pacific Salmon essential fish habitat will also be used and protected by CWF H3+. Again, construction effects being limited by the in-water work windows and by minimization measures and habitat restoration.

As I discussed, there's potential for less

South Delta entrainment.

And then, finally, protection from the potential for reduced survival from the North Delta diversions.

Although -- Although the real-time management will be focused on the risk to listed Salmonids, there is substantial temporal overlap of these unlisted Salmonids which, in my opinion, will also -- and as reflected in the NMFS Biological Opinion -- will also protect these unlisted Salmonids, as well as the various environmental commitments that I mentioned; for example, habitat restoration, Georgiana Slough barrier, and is shown to be necessary through adaptive mana -- through more entrainment adaptive management potentially predatory fish relocation from the North Delta diversions, for example.

Finally, on to the last section, which is BDCP covered species and other aquatic species of primary management concern.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: So, in addition to the species that I've been discussing, the Smelts and Salmonids and Green Sturgeon, there are several other species that were included in the BDCP analysis. These

included White Sturgeon, Sacramento Splittail, Pacific and river Lamprey, as well as other species that were included because of ecological or economic importance; for example, Striped Bass, American Shad, and Largemouth Bass as good examples of recreationally important as well as ecologically important species.

Sacramento Tuly Perch is an important native species.

And then, finally, Threadfin Shad and Bay Shrimp, which are also ecologically important as well as commercially important.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS BUCHHOLZ: It's my opinion that these other species will generally be protected by CWF H3+. Again, the same -- same issues as I've already described for listed fish and unlisted Salmonids.

The various measures in place to avoid, minimize and mitigate construction effects will be important to limit the potential for effect and provide reasonable protection.

And, then, through the poten -- through less South Delta exports as well as the North Delta diversion screening, for example, limited to operational effects.

And then several of these species have flow abundance relationships, or, actually, X2 abundance relationships that have been shown. And these were analyzed as well.

And I'd like to just pull up, please, from the SWRCB-102. This is the FEIR/S Chapter 11.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: And then Page 719.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: A very intimidating table of results for all the different alternatives lined up together.

But the main -- These are average predicted survey abundance indices for Striped Bass. This example here is from the . . .

I was expecting a different one but it doesn't -- it doesn't really matter.

Just as an illustration, this -- this is Striped Bass Bay Otter Trawl predicted abundance index. And this is as a function of Delta outflow, actually X2, during the early life history.

The columns focus on, for the purposes of CWF H3+, are NAA_ELT, which is the No-Action Alternative. And then to columns next to that, H3 and H4.

And then scroll -- Going down to the bottom are the differences between the H3 and H4 from the No-Action Alternative. And these are just to illustrate that, under H3, there are small negative percent differences. And under H4, there are small -- similar small differences are positive.

H3+ falls in between these, and so there's very -- This illustrates that there's very little difference between the two, which, in my opinion, indicates reasonable protection.

As another example, if you could pull up Page 11-727.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: This one is for Striped Bass. I just showed you another example.

I think it's just 727. Sorry. 727.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: Can you stroll down just to show . . .

(Exhibit displayed on screen.)

WITNESS GREENWOOD: If you go back a few pages, it's 11-727 is the page, not the .pdf page. It's the actual page in the document.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: Similar -- Basically the

same layout of table but this one is for American Shad.

Again, focusing down on those two columns below Alt 4A, H3 and H4. Again, this is just to illustrate small differences between the Project and the No-Action Alternative.

And one last example. If you can go to 749, 11-749 in that document.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: The final species that we analyzed in this way was Bay Shrimp. Yeah.

And so, again, looking at those -- Do you think you'll be able to highlight those two columns there that are in the -- in the bottom row, bottom two rows there. Just over to the right from those.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: Yeah, I guess you can't because it's .pdf.

But I'm meaning those two columns there essentially. Small percentage negatives for H3, small percentage positives for H4. H3+ lies in between those and, therefore, contributes to my opinion that there will not be a difference between the No-Action Alternative and CWF H3+, these abundance indices and, therefore, that there will be reasonable protection.

If you can return back to my PowerPoint,

please.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: This is my -- Next -- Next slide, which is also my last slide.

(Exhibit displayed on screen.)

WITNESS GREENWOOD: In the EIR/EIS, the only significant and unavoidable impact that we found was for Striped Bass and American Shad. This is because of entrainment of early life stages at the North Delta diversions. These are species that spawn upstream of the North Delta diversions, in large part.

And for American Shad, studies suggest that many American Shad were upstream of the Delta and, therefore, when they're coming down into the Delta, they would be sufficiently large to be screened by the North Delta diversions.

For Striped Bass, the eggs and larvae drift downstream to the rear in the Delta and are, therefore, susceptible to entrainment at the North Delta diversions. They would be too small to be screened in many cases.

The analysis included in the FEIR was based on a somewhat limited set of particle -- particle tracking modeling that was done.

Particles -- Particle tracking is one of the

modules in DSM-II that allows assessment of movement of particles, which, in this case, are being taken to represent early life stages of these species that are moving through the Delta, possibly.

And this showed the potential for this effect to occur. These were particles released in Sacramento moving downstream.

As I mentioned, the -- the -- there's a fairly limited number of months that were included in the particle tracking runs that were included in the FEIR.

For my written testimony -- I have a little bit more detail in this in my written testimony but I basically -- I used modeling that was done for the BA -- it was actually done for Delta Smelt -- to illustrate that because of the Spring Flow Criteria that would be included in CWF H3+, there will be some protection from -- for the -- for the spring -- from the Spring Flow Criteria from entrainment at the North Delta diversions, because during the spring, which is the main time when these early life stages will be coming down, there'll be these constraints on exports in general and including North Delta diversion exports that will provide some protection from this potential effect.

So that includes -- That concludes my summary

testimony today.

And I think next will be Dr. Rick Wilder discussing the upstream fish effects.

CO-HEARING OFFICE DODUC: Thank you.

But before Dr. Wilder begins, let me look at the court reporter. I think we could use a short break.

THE REPORTER: (Nodding head.)

CO-HEARING OFFICE DODUC: Let's break until 2:45.

(Recess taken at 2:33 p.m.)

(Proceedings resumed at 2:25 p.m.:)

CO-HEARING OFFICER DODUC: All right. If you could all take your seats. It's 2:25. We're resuming.

A reminder to everyone that we will not be in this building on Monday but will be at our Regional Board office in Rancho Cordova.

The good news is, there will be free parking.

The bad news is, we will not have as spacious a room. And, also, I've been told the Wi-Fi there is exceedingly slow?

MS. McCUE: Spotty.

CO-HEARING OFFICE DODUC: Spotty.

So be forewarned that you might need to bring your own wireless connections, if you have them.

Mr. Mizell, a quick time check.

Were you intending for Dr. Greenwood's testimony to take -- was it an hour and 30 minutes? Or --

MR. MIZELL: Yeah. I had it recorded as an hour and 25 minutes, and that's --

CO-HEARING OFFICER DODUC: Okay.

MR. MIZELL: -- maybe five minutes longer than we expected but --

CO-HEARING OFFICE DODUC: Perfect.

MR. MIZELL: -- it's in the ballpark.

CO-HEARING OFFICE DODUC: Okay. And how long should we expect Dr. Wilder's testimony to take?

WITNESS WILDER: Right around 20 minutes.

CO-HEARING OFFICER DODUC: Okay. Then let's do so.

WITNESS WILDER: Okay.

CO-HEARING OFFICE DODUC: That's not, Dr. Greenwood, to say that your presentation wasn't absolutely riveting. I was just concerned about the time. All right.

WITNESS WILDER: Good afternoon. I am Dr. Rick Wilder. I work at ICF as a Senior Fisheries Biologist.

I've been a consultant now for about 11 years.

And since day 1 of my consulting career, I've worked on the California WaterFix and its predecessor, the Bay-Delta Conservation Plan.

Also during my time as a consultant, I have worked on other -- several other large water infrastructure projects in the Central Valley.

I've focused on aquatic resources of those, the effects of aquatic resources on those, as well as participating in the planning of several Habitat Conservation Plans in the Central Valley, looking specifically at fisheries resources.

I've also had the opportunity to conduct and publish original research and -- during that time on -- also on threatened and endangered species in the Central Valley.

Before my consulting career, I worked for the U.S. Fish and Wildlife Service on a large Fish Monitoring Program in the Bay, Delta and Lower Sacramento and San Joaquin Rivers.

Can we go to my PowerPoint, please.

(Exhibit displayed on screen.)

WITNESS WILDER: Thank you.

And so I'm here today to discuss upstream aquatic resources as they relate to the California WaterFix.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: My testimony will consist of: First, a brief introduction; followed by a summary of my opinions; and then moving on to analytical methods, results and conclusions upon which my opinions are based.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: As -- As you saw, Dr. Greenwood focused on the Delta aquatic resources and so my testimony is specific to upstream aquatic resources, upstream of the Legal Delta.

My testimony is organized by species or, in the case of similar species, by species group.

We had nine covered species for California WaterFix. Four of those are listed species, ESA listed species, and those are winter-run and Streamline Chinook Salmon, Central Valley Steelhead and Green Sturgeon.

And we also had seven non-covered species of special concern. And then an additional group that I collectively call cold water reservoir species that we analyzed and I'll be discussing.

It's important to know that the only way the

California WaterFix can influence upstream waterways is through reservoir operations, and that's done either by -- by really -- by changing releases from the reservoir which influences flow rates in the rivers, or by -- by changing water temperature to some extent downstream.

I have a couple other things before we go on that I'd like to mention that aren't in my written testimony.

First of all, this -- this analysis was the result of extensive collaboration with the -- you know, the fish and wildlife agencies, as Dr. Greenwood mentioned in his testimony, and as Ms. Kathy Marcinkevich mentioned -- from NMFS mentioned in her Opening Policy Statement a couple weeks ago.

We always analyze -- Our analysis always consists of a comparative analysis when we look at a with and without Project in keeping with the guidance of the modelers on appropriate use of the model outputs that they provided.

CO-HEARING OFFICE DODUC: Hold on, Dr. Wilder.

MR. JACKSON: Yes. I'm sorry for interrupting.

I just wanted to confirm that Policy Statements are not evidence. And insofar as he is

talking about his collaboration with someone who didn't come and can't be cross-examined, I don't think that's admissible.

CO-HEARING OFFICE DODUC: Mr. Mizell.

That actually was -- Did you -- I was trying to recall, Dr. Wilder: Did you preface that statement by saying it was not in your written testimony?

WITNESS WILDER: Not the part -- Not that part, no. I'm happy to strike that.

MR. MIZELL: Dr. Wilder's testimony speaks to collaboration but not to the Policy Statement that was not known to him at the time that he made his testimony but was given to you during the Policy Statements a few weeks ago.

CO-HEARING OFFICE DODUC: And since Policy Statements are not evidentiary, motion is -- or objection is sustained. We will strike that part from Dr. Wilder's testimony.

MR. MIZELL: Okay.

WITNESS WILDER: I also want to mention that the -- the rivers that we analyzed include the Sacramento, American and Feather Rivers primarily and also the Trinity River and Clear Creek to some extent.

We conducted in -- in many cases several analyses for the same -- to look at the same impact.

And by doing so, we were able to -- to provide a weighted evidence approach which we feel is superior than just that one analysis.

And, then, also, the -- My definition for "reasonable protection" is identical to that described by Dr. Greenwood and also described at the bottom of Page 6 of my testimony in Footnote Number 2, but generally consists of following the standards of -- of existing regulations, such as ESA, Biological Opinions, Fish & Game Code and Water Code.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: So now, Mr. Hunt, if you could move to my written testimony, DWR-1013 Signed --

(Exhibit displayed on screen.)

WITNESS WILDER: -- and go to Page 6, Line 20.

(Exhibit displayed on screen.)

WITNESS WILDER: And I'm going to briefly summarize these. I won't be reading them verbatim.

California WaterFix -- These -- These are my opinions:

California WaterFix H3+ or, as I'll also call it, the Project for now -- we'll be calling it that for now -- will result in minor changes to upstream flows and water temperatures and, therefore, habitat

suitability for the upstream life stages of winter-run -- excuse me -- spring-run and fall-, late fall-run of Salmon, as well as Central Valley Steelhead, and operational criteria as well as real-time stages implemented during the implementation of the Project will reasonably protect the Salmonids.

If you could go on to the next page, please.

(Exhibit displayed on screen.)

WITNESS WILDER: Line 6 (reading):

"The Project-related changes in upstream flow and water temperatures are unlikely to have a population level effect on winter-run, spring-run, and fall-/late fall-run Chinook Salmon and . . . Steelhead.

"The Project will result in minor changes to upstream flows, water temperatures, and habitat suitability for the upstream life stages of Green and White Sturgeon, and operational criteria and real-time operational adjustments will reasonably protect Sturgeon."

If you could go down to Line 18, please.

(Exhibit displayed on screen.)

WITNESS WILDER: Thank you.

The Project will maintain reasonably protective upstream flow and water temperature

conditions for the upstream life stages of Splittail, Pacific Lamprey and River Lamprey.

And if you can scroll down to the last two.

(Exhibit displayed on screen.)

WITNESS WILDER: The Project is reasonably protective of non-covered species of primary management concern regarding the upstream life stages and also is reasonably protective of cold water reservoir species in the upstream reservoirs.

Now, if we could go back to my PowerPoint, Slide 6.

(Exhibit displayed on screen.)

WITNESS WILDER: Thank you.

Focusing specifically on Salmonids now, we -- there were two species as I mentioned, Chinook Salmon, Central Valley Steelhead, were evaluated. There are four races of Chinook Salmon, winter-run, spring-run, fall-run and late fall-run.

NMFS combines fall- and late fall-run into a single evolution -- evolutionarily single unit, or ESU, so they have three ESUs they evaluate.

And then Steelhead is the last -- is the second species.

And this table just describes the general timing of the upstream presence of -- of each of these

races and species.

The related take-home message right here is that there are different races and different life stages present pretty much definitely throughout the year in these different tributaries.

And, so, for our analyses, we looked at the specific periods of timing for the specific life stages and races and/or -- or Steelhead species.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: So specifically to the EIR, Final EIR now, EIR/EIS, these were the -- the life stage groups that we analyzed.

You notice this is different from the previous page and that's because we combined some of the life stages here in these three groups for simplicity.

So we had spawning and egg incubation, fry and juvenile rearing, and then migration of juvenile and adults.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: The analytical approach for Salmonids consists of looking at reservoir storage, flow, water temperatures and, in the case of winter-run Chinook Salmon specifically, we had a couple life cycle

models that we evaluated.

And as you've heard before, the Final EIR/EIS evaluated H3 and H4, as well as BA H3+. And in that analysis -- Or in that FEIR/EIS we conducted a sensitivity analysis showing that BA H3+ generally falls within the bounds of H3 and H4.

And then during the -- Or in the 2017 Certified EIR/EIS, we conducted a further sensitivity analysis that confirmed that BA H3+ falls with -- or is -- is generally comparable/similar to -- and similar to CWF H3+.

And this allows us, then, to make conclusions for CWF H3+ based on H3 and H4.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: Now, looking specifically at the reservoir storage analysis, we used CalSim II outputs for end of May and end of September using a comparative approach, as I mentioned, between the BA -- I'm sorry -- the -- the NAA and H3 H4 scenarios, and found generally that both end-of-May and end of spring -- end-of-September storage volumes in the Sacramento, Feather, American Rivers and, actually, Trinity River as well are similar between NAA and H3 and H4 and, therefore, CWF H3+.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: For the -- For the flow analysis, the primary flow-related biological parameters that we evaluated including for spawning and egg incubation, spawning habitat availability, redd dewatering and redd scour.

For fry and juvenile rearing, rearing habitat availability and juvenile stranding.

And then the migration of juveniles and adults and, in the case of Steelhead Kelts, which are simply the -- the coast spawn adults that move back down to the -- the ocean through the river.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: So the approach we used was, we consider the best-available, most appropriate analy -- tools to -- to evaluate effects in these rivers that have been used by other professionals.

The three tools, in particular, that we evaluated are as follows:

First, we looked at the mean monthly flow rate using modeled outputs. This made a -- a large conservative assumption that an increase in flow is good for fish and a decrease in flow is bad for fish.

Although that's generally true, it's not always true, but we -- when we had nothing else to go with, we went with that assumption.

We also used the Sacramento Ecological Flow Tool, or SacEFT. This tool models the effects of changed water operations on physical habitat components for Salmonids and Green Sturgeon in the Sacramento River.

And then, lastly, we used a model called SALMOD that evaluates flow and temperature-related mortality of early life stages of -- of Chinook Salmon in the Sacramento River and also provides an estimate of juvenile production.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: The -- The mean monthly flow rate comparison found that generally there were -- although there were some small changes, that none of them would be of sufficient magnitude or frequency to cause biologically meaningful effects on any of the Salmonid species.

In general, the reduction in flows, mean flows, were less than 5 percent.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: For SALMOD, the habitat-related or flow-related mortality results were essentially negligible in terms of differences between NAA and H3 and, therefore, CWF H3+ for all species except for winter-run, in which case we actually had 7 percent reduction in flow-related mortality, which is a long way of saying an increase in survival, so it could be perceived as a benefit.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: Now, for the -- So I'm just speaking about the EIR/EIS.

For the Biological Assessment and BiOp and ITP application, there were several additional analyses conducted for flow and, in a minute, I'll talk about temperatures.

But these generally showed there are minimal effects overall, even though, as I mentioned before, that we did find some flow-related effects.

And NMFS ultimately issued, as we know, a -- a Biological Opinion that indicates no jeopardy and no adverse modification for the listed species.

They also indicate in their Biological Opinion that real-time operations that are -- that are being written -- that were written into the Biological

Opinion will help minimize any of these small flow-related effects that we're seeing.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: For the water temperature analysis in the EIR, we used the following multiprong approach. We looked at four different types of analyses. And I won't go through them unless you really want me to at this point. It's all in my written testimony.

But I will mention that we used this multiprong approach, again, as a weighted evidence approach to allow us to look at all the different ways that temperature could be affecting Salmonids and draw a conclusion based on the weighted evidence.

Also, a couple of these analyses, particularly Number 2) and 4), looked not only at the -- the frequency of exceedance above temperature thresholds but took it one step further and also looked at the magnitude of any exceedance above those thresholds and thereby was a -- a better analysis than some of our previous attempts.

And I -- I also want to mention just as an aside for -- under Number 3), the percentage of -- of months exceeding a 56-degree threshold. That only

applies to eggs. We actually had different -- different thresholds for different life stages.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: The results basically consistently show that temperature-related effects to the Salmonids are minimal to -- in the upstream -- the upstream life stages of Salmonids, that is -- and, therefore, it's my opinion that H3 and H4 and, therefore, CWF H3+ is reasonably protective of these -- these upstream life stages.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: As I mentioned before, the -- the Biological Assessment and Biological Opinion and ITP process added additional analyses above and beyond the -- the EIR for listed species. These included such things as NMFS's own water temperature model and egg mortality model, as well as a life cycle model for winter-run Chinook Salmon.

And overall, while small differences, again, were observed in some of the model outputs, real-time operations and current modifications of the OCAP RPA, which are currently under -- underway, would be reasonably protective of Salmonids, that -- the

upstream life stages of Salmonids and, ultimately, they, as I mentioned, issued a Biological Opinion for a non-jeopardy and no adverse modification.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: For Green and White Sturgeon, the analysis consisted of spawning and egg incubation flows and water temperatures, rearing water temperatures and, although it's not listed here, migration of -- of adults and -- Yeah, adults.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: Looking specifically at spawning and egg incubation, we looked -- we used a mean monthly flow analysis using CalSim outputs. And these analyses indicate that flows during the spawning period would generally be similar between NAA and H3 and H4. This is actually specific to the Sacramento River.

In the Feather River, which is the next slide -- the next sub-bullet, dash, flows would generally be similar to or substantially higher under H3 and H4 compared to the -- the No Action Alternative.

And then we also did an analysis of BA H3+ compared to NAA, and it also shows that there are no --

no flow reductions that are greater than 5 percent in -- in the Sacramento River.

We found one in critical years during July in the Feather River of 9 percent.

And next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: And given that this -- this only occurred once in the Feather River doesn't change my opinion that, overall, CWF H3+ is reasonably protective of Sturgeon spawning in all of the rivers -- in both of the rivers, Sacramento and Feather.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: For spawning and egg incubation water temperature analyses, you've seen this list before. It's the same as was done for Salmonids. I won't mention anything anymore than, once again, we tried to use a weighted evidence approach to look at all the different ways that water temperatures can affect these species and these -- this life stage).

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: And, overall, the four analyses indicate that the temperature-related effects to Green and White Sturgeon would be minimal, spawning

and egg incubation life stages specifically.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: For rearing water temperatures, the analytical approach consisted of these three approaches, which are similar to the ones you've seen before minus the level of concern analysis which just didn't really make sense to do for -- for rearing water temperatures.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: And although there were some small differences, again, observed in model outputs considering real-time operations and -- considering real-time operations, it's my opinion that CWF H3+ is reasonably protective of Green and White Sturgeon rearing.

And I also want to mention that we -- as I -- as I mentioned before, we did make gradation flows analysis and generally found the same -- the same result, that any flow differences during the migration periods would be minimal and, therefore, not enough to change my opinion that CWF H3+ would be reasonably protective of Green and White Sturgeon.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: And this -- this conclusory slide just reiterates that CWF H3+, in my opinion, is reasonably preserve of Green and White Sturgeon in upstream waterways.

And this is evidenced by the minimal effects that we see in the preponderance of months and water year types during their presence.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: We also analyzed flow and temperature effects to Sacramento Splittail.

In addition, we looked at a flood plane inundation analysis, although there was -- there's no -- there's really no difference in floodplain inundation between the two.

However, during the period of upstream presence for Sacramento Splittail, we generally found that there were no negative effects at all to Splittail. Flows are generally similar to or greater than NAA for H3 and H4 and, therefore, CWF H3+.

And H3 and H4 fall within the optimal range that was -- that we took from the literature for Splittail -- for Splittail water temperatures, at a similar frequency to those of the NAA.

And, therefore, we conclude that CWF H3+ is reasonably protective of Sacramento Splittail.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: For Pacific and River Lamprey, the results indicate, particularly for River Lamprey, that there would be a mix of small to moderate increases and decreases in flows in some months, but, overall, that would not change my opinion that CWF H3+ is reasonably protective of both Pacific and River Lamprey.

For this analysis, we looked at mean flows, water temperature thresholds, and we also did a stranding and redd dewatering analysis to arrive at -- at this opinion.

And next slide, please.

(Exhibit displayed on screen.)

WITNESS WILDER: Finally, looking at non-covered species of primary management concern.

We looked at the list that was similar to that presented by Dr. Greenwood previously for the -- for the in-Delta species and found -- Well, the methods consisted primarily of -- of flow -- mean monthly flow comparisons as well as temperature threshold analyses using thresholds taken from the literature.

And we generally found no major differences between -- between the NAA and H3 and H4 and, therefore, conclude that CWF H3+ would be reasonably protective of non-covered species.

And the final analysis that we did was the cold water reservoir species, also non-covered species, where we looked at the -- the volume -- cold water pool volume for September at -- at each of the upstream reservoirs that could be affected by CWF and found, again, that there were minimal differences between NAA and H3 and H4 and, therefore, we conclude that CWF H3+ is reasonably protective of these cold water reservoir species.

That concludes my oral testimony, and now I will move on to -- We move on to Erik Reyes.

WITNESS REYES: Good -- Good afternoon, Board Members.

My name is Eric Reyes. I'm employed by the Department of Water Resources.

I am the Chief of the Central Valley modeling section, and that section primarily deals with the CalSim model and its application and development.

And I've been Supervisor of that group for the last four years and have worked about 20 years for DWR working on model development, primarily with CalSim.

My testimony today will present the CalSim modeling for Part 2.

And, if you could, Mr. Hunt, please pull up DWR-1028.

(Exhibit displayed on screen.)

WITNESS REYES: And move on to the next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: So, my testimony has been broken up into five parts.

The first part is going to cover the Cal WaterFix history plus proposed operations criteria and kind of highlight what those are.

Part 2, I'll be going over an analysis of the changes on going from the BA modeling to the California WaterFix H3+ that we're presenting today in the Petition.

Part 3, I'll be going over the modeling approach used in the Petition and contrasting it to the modeling approach of the EIR.

Part 4 of my testimony will go over the actual modeling results for CWF H3+.

And then, finally, I'm going to go over the modeling approach in general. And I think Dr. Greenwood had already showed that particular slide

of how the -- the different models used to analyze the -- the biological effects and how they all came together and formed our opinion.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: I'm presenting some opinions that will be essentially shown in the -- in the follow -- following slides.

But, first off, the modeling shows that CWF H3+ meets D-1641 fish and wildlife requirements, including X2, net Delta outflow index, otherwise known as NDOI, Rio Vista minimum flows and the export/inflow ratio.

The modeling will show that Cal WaterFix also -- or H3+ also meets the 2008 and 2009 Biological Opinions. And for the requirements that represent OMR, Old and River flow requirements and Fall X2.

The modeling will show that the end-of-May and end-of-September storage levels are similar to those storage levels in the NAA, the No Action Alternative, in the major SWP and CVP upstream reservoirs.

Water deliveries to CVP and SWP contractors, including settlement contractors, exchange contractors, Refuge Level II, and Feather River service area contractors are going to be similar to the NAA in -- in

the Cal WaterFix case, CWF H3+.

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(Exhibit displayed on screen.)

WITNESS REYES: My opinions are that:

Long-term average deliveries to CVP and SWP North-of-Delta and South-of-Delta water service contractors are going to be similar or higher than they are in the No-Action Alternative case.

And my last opinion is: That the sensitivity analysis shown in the Developments After Publication of the Proposed Final Environmental Impact Report, which is SWRCB Exhibit 108, which Dr. Greenwood also highlighted.

And I'll be referring to this later as the DW -- the epilogue. It compared the incremental changes under the BA H3+ and the CWF H3+ relative to the No-Action case.

And the sensitivity analysis shows that the overall operations, including upstream storage, river flows, and water supply deliveries remained similar.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: So for Part 1 of my presentation.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: I'll be going over the proposed operations criteria.

So, CWF H3+ represents the proposed initial California WaterFix operational criteria.

A couple points to highlight:

As presented in Part 1, the CWF Proposed Project is Alternative 4A with operations criteria H3 to H4.

In August of 2016, the Biological Assessment included just a single set of operations criteria, and that was then known as H3+.

And then, in July of 2017, the Notice of Determination included slight revisions to the H3+, and that is what we are presenting in this Petition today, Cal WaterFix H3+.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: And I think you've seen this same graphic before from Miss Buchholz and Dr. Greenwood.

And, again, it's just to kind of give some background and, like, sort of a roadmap to -- to look at where we've been and where we are now.

For Part 1, we presented results showing

Alternative 4A, California WaterFix Alternative 4A, H3 and H4.

And then, as the Biological Assessment preparation took place, that got narrowly defined into BA H3+. And what that included was updated Spring Outflow Criteria. That was different than what was assumed in H3 and H4.

For Federal ESA and CSEA consultation, the Biologic -- Biological Opinions, Notice of Determination, had further updates to Spring Outflow Criteria and updated fall South Delta export constraint, and that is what ultimately became the CWF H3+ that we're presenting.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: All right. So what has not changed?

So, all the operational criteria for Alternative 4A H3 to HR presented in Part 1, and that was Table 1 in -- in DWR Exhibit 515, remains the same except for two items:

Spring outflow, and fall South Delta OMR and export restriction.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: So what has changed? It's pretty obvious. The same things that I said were the only things that changed.

The changes to the spring Delta outflow requirement, and also the changes to the fall South Delta export constraints.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: So, some more detail into the spring outflow requirement change.

A March outflow requirement was added, and that outflow requirement is dependent upon the forecasted hydrologic conditions in March, being -- that being the Eight-River Index. Total Delta exports are curtailed to no less than 1500 cfs, if needed, to meet this requirement.

And the San Joaquin River inflow-to-export ratio is included as a requirement, but suspended when Delta outflow is greater than 44,500 cfs. And those are the elements that make up the spring outflow change.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: And the other item that was changed is the fall South Delta export constraint.

And CWF H3+ in the months of October and November, OMR flow requirements and South Del -- South Delta export restrictions were removed and, thus, returning to the levels of the No-Action Alternative.

All right. Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: So what I have shown here is a table that was put together that is similar to what was Table 1, DWR-515 exhibit from Part 1, except for, in Part 1, we only had information for the No-Action, H3 and H4. Now we're adding the same information for the BA H3+ and also Cal WaterFix H3+.

And what this table really is, is what we call an assumptions matrix.

On the far left, you have assumptions criteria, whether it be the planning horizon or the -- the inflows and supplies, which facilities are included, and whatever regulatory criteria you may be needing.

So that's what this -- this table is.

And can you please go to the next slide.

(Exhibit displayed on screen.)

WITNESS REYES: And, so, what I'm showing here is that all the criteria for the far right column, CWF H3+, is the same as what's presented in H3 and H4,

except for where there is a yellow highlighted box.

And in this case, on this slide, you see that for a combined flow in Old and Middle River, the NAA has criteria that is consistent with the Fish and Wildlife BiOp and the NMFS BiOp.

H3 added new criteria that was more restrictive than -- than the current BiOps. H4 had the same criteria; the BA H3+ also had the same criteria.

And in California WaterFix H3+, it's the same criteria except for in the months of October and November where those criteria are rolled back to what they are in the BiOps.

And then can you move to the next slide, please?

(Exhibit displayed on screen.)

WITNESS REYES: And then this category for Delta outflow requirements.

Again, you have the No-Action case that assumes D-1641 criteria as well as the BiOp criteria. H3 has the same as -- as -- same criteria as the No-Action case.

H4 implemented a version of -- of an outflow requirement that I guess in -- in the aggregate had the -- the highest outflow levels requirement.

BA H3+ had a modification of that, which was

somewhere in between H3 and H4.

And then Cal WaterFix H3+ had a slight modification of -- of that spring outflow.

And the main difference there, like I said before, was an addition of March as a month of requirement and some of those other changes.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: So, for Part 2, I'll be going over the analysis of the Biological Assessment to the Notice of Determination changes.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: So that what I'm calling the DWR Epilogue, what was that long-title document, which is SWRCB Exhibit 108.

There was sensitivity analysis performed to assess the operational effects of the changes between the BA and the NOD.

And essentially the implications to water supply, surface water, water quality and fisheries resources were found to remain similar to the FEIR/S Alternative 4A.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: For Section 3, I'm going over the operations modeling approach.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: And just to remind folks:

For the Petition process, we have been using a 2015 version of the CalSim II model, and it was used to simulate the No-Action Alternative as well as different versions of the Cal -- California WaterFix operations in this Petition and in the BA.

And for the EIR, a 2010 version of the CalSim II model's used for -- for these model studies. And so I just wanted to -- to highlight that difference.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: And now I'll be going into the actual modeling results.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: So, just restating my opinion: Cal WaterFix -- Cal WaterFix H3+ scenario meets the D-1641 fish and wildlife requirements, including X2, NDOI, Rio Vista, and export/inflow ratio.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: So what I'm showing here is a -- a plot that is attempting to show compliance with the spring X2 criteria.

So what you see is, on the left axis, it's a difference in flow between the simulated flow of -- of a certain alternative. In this case, we're showing two alternatives, the No-Action Alternative and the CWF H3+ alternative. And it's that actual simulated flow minus the standard, whatever that standard may be.

And so that -- The dashed line is the requirement. So when -- For an outflow requirement like spring X2, if you have flow flowing through the Delta that exactly meet the required flow, then that difference would be zero. And so that dashed line means you're in full compliance.

Any -- Any . . . points that would fall below that line would be a non-compliance case. And any flow above that line means flows when you're exceeding the requirement.

So, the point I'm essentially trying to make in this chart is that, in both the No-Action case and for CWF H3+, they are fully compliant with the D-1641 spring X2 standard.

And this particular chart is plotting all the

months of requirement, so February, March, April, May, June.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: So this is that same information but now broken out by month.

And essentially just to give you a little bit more granularity and then what that might look like, the outflow requirements.

But the -- the point here is that it's in full compliance.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: Similar plot. This is now the D-1641 net Delta outflow index requirement. And, again, attempting to show that we're complying with this particular standard.

And being that there are no points below the zero line in this chart, that indicates that we are in full compliance.

And I forgot to mention that the -- the horizontal axis is the frequency with which certain flows are -- are being exceeded.

Next chart, please. Or next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: Again, this is the different months broken out individually.

And so our simulation period is -- is over 82 years, and so each of these months is essentially showing 82 specific points on these charts for each alternative.

And I guess sort of an interesting kind of thing to know is, if you look at the months of September, October, and November, you see sort of the second double hump effect in the outflow.

And what that is, is, that's the Fall X2, you know, so there's two different levels of Fall X2 requirements, depending on if it's falling in a normal year or wet year.

And so that, then, is -- generally far exceeds the requirements for the NDOI in those same months and so you see kind of this double hump in the -- in the result.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: And then this is just the month of January.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: This is the same -- same type

of information. I'm sorry if I'm boring you with -- with a bunch of charts that look similar.

But I'm just trying to show that we are fully compliant with the D-1641 Rio Vista requirement.

And if you can go to the next chart, please.

(Exhibit displayed on screen.)

WITNESS REYES: Again, this is broken out in the months individually.

And next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: Okay. Now, it's kind of a similar format, but we have to change gears a little bit.

So this is D-1641 export/inflow ratio compliance. And compliance with the export/inflow ratio means, if you are exporting a lesser proportion of the inflow, then you are exceeding your compliance.

And so, in this case, this chart has the months of March through June where the requirement is 35 percent of -- of the inflow, 35 -- Exports that are 35 percent of the inflow or less will be complying. And so that's why you see the dashed line at 35 percent.

And so what's different in these charts is, when you're below that line, that means you're in

compliance. And so, again, both the No-Action case and CWF H3+ are fully complying.

The next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: And so that export/inflow ratio requirement has two main requirements, and they -- they vary by month.

So this is the 65 percent requirement that is from July through January.

And, again, when we're below the line in this case means we are fully compliant with the requirement.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: And, lastly, for the EI ratio. This is for the month of February, which is the one unique month in that -- in that criteria where the criteria's actually between 35 percent and 45 percent. And it varies based on the previous month index, which is next.

And the No-Action case is actually fully compliant in this case. It's -- Whenever it goes above 35 percent, those are the -- the months when the requirement is actually 45 percent.

And then for the California WaterFix H3+ case, we're actually below even the 35 percent requirement at

all times in the month of February.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: Okay. So that was 1641. Now we're going to move on to the 2008 and 2009 BO requirements for OMR and Fall X2.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: So this is showing OMR compliance. And that's the Old and Middle River flow.

And the same thing. If your flow's above that line, that means you're doing better. If you're below that line, you're -- you're not meeting that requirement. And if you're on that line, you're meeting the requirement.

And so both the No-Action and WaterFix are -- are fully compliant with that requirement.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: This is each month broken out, similar to the previous slides.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: Then June.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: Now we're going into Fall X2 compliance.

So this is for all the months that are -- are requirement months, which is September, October, November.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: And you can see them by month.

And the main thing here is when fall X2 is controlling, you pretty much are -- or at least the way it's modeled, it's meeting it right on. And only as you get into the wetter part of the season, November, do you have, like, these larger exceedances -- or not exceedances but where you're doing better than the standard.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: It is my opinion that similar end-of-May and end-of-September storage levels are achieved when compared to the No-Action Alternative case in the major SWP and CVP upstream reservoirs.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: So this chart is a -- a

typical exceedance chart that we've presented previously.

So, again, on the horizontal axis, you have percent exceedance. On the vertical axis, that you have -- It's just in this case end-of-May storage in -- in Shasta Reservoir.

And all I'm really trying to show here is that, you know, if you look at the black line, the No-Action case, and the kind of pink/purplish line, which is California WaterFix H3+, they're very similar or -- or the H3+ is actually maybe higher than that line at -- at times.

And the other lines are just there for reference because we presented similar information in Part 1.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: This is Oroville, and also for end of May.

And the same thing here. You see the pink line is -- is above the black line.

And the H4 line is, I think, the line that you see that is the only one that kind of differs from the rest, and that's -- For that particular alternative, it had a higher outflow requirement, and that outflow

requirement in the modeling was -- was mostly supplied by Oroville Reservoir, and that's why you see that difference for that particular alternative.

But for the H3+, you see that it's -- it's the same as the No-Action or a little bit higher.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: This is the same plot for Folsom Reservoir end of May. And the same conclusion I'm drawing is that they're similar to the -- to the No-Action, or the California WaterFix H3+ is similar to No-Action.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: And the same conclusion I have for Trinity.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: Now we're shifting gears and going into end-of-September storage, and this is Shasta.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: Oroville. And I think, again, we're doing better than -- better than the No-Action

case in -- in most times, or the same or better.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: This is Folsom Reservoir. And this is one that is a little bit different in that it's -- it's similar -- very similar to No-Action when you compare the pink and the black line up until about where that line crosses the 500,000 acre-foot storage level mark and there is some -- some difference there.

But that -- Those years, when they're above 500,000 acre-feet in the month of September, are wetter type years. But my conclusion is that it is pretty similar storage-wise.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: And this is Trinity. Again, very similar in terms of end-of-September storage.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: It is my opinion that we have similar water deliveries to CVP and SWP contractors, including settlement contractors, exchange contractors, Refuge Level II contractors, and Feather River service area contractors when compared to the No-Action case.

And this is mostly for public interest, but

we're just displaying this data today.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: So these are just bar charts that have the long-term average deliveries as well as the average deliveries for different year types, from wet, above normal, below normal, dry and critical.

And, again, I think here we want to just compare the -- the purple bar to the black bar, or you have the table below that you could read that shows that the deliveries are very similar for -- And, in this case, we're looking at CVP settlement contractors.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: CVP exchange contractors. Again, very similar.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: This is CVP North-of-Delta Refuge deliveries. And the same conclusion: Very similar.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: This is South-of-Delta Refuges, and, again, the same conclusion: Very

similar.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: This is on the Feather River -- SWP Feather River service area contract deliveries. Very similar or maybe sometimes a little bit higher in critical years.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: It is my opinion that similar or higher deliveries to CVP and SWP North-of-Delta and South-of-Delta water service contractors are achieved when compared to the NAA.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: So this is CVP North-of-Delta Ag. And it's very similar to the No-Action case.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: This is CVP North-of-Delta M&I deliveries. And again it's very similar to the black bar of the No-Action case.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: This is SWP North-of-Delta

delivery. And it's similar to the No-Action case.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: This is the South-of-Delta CVP service contractors and the South-of-Delta SWP deliveries.

And, again, it's very similar or sometimes a little bit better.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: So the last section of my presentation is just to go over the same information that Dr. Greenwood went over, but I'll kind of go over it again just to provide some context.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: So I'm going over the modeling approach that's been used for this biological effects analysis and -- And how the different models were used to -- to inform each other and -- and -- and essentially provide information to each other.

So I think the starting model for most of this analysis is hydrology and system operations, which in this case is the CalSim II model. And information from CalSim II then goes into --

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: -- the upstream water temperature models, which include models on the Trinity and Sacramento River, Sac River at 5Q, and there's different versions of that for the different water systems.

And they also -- Information from CalSim also feeds into --

Next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: -- Delta hydronamics -- hydrodynamics and water quality models, which would be DSM-2 HYDRO and DSM-2 QUAL, and then information from those feed into salinity models and Trinity models like DSM-2 PTM.

And next slide, please.

(Exhibit displayed on screen.)

WITNESS REYES: And then information from all these models feed into the different fisheries models, which both Dr. Greenwood and -- and Dr. Wilder -- oh, I'm sorry -- yes, Dr. Wilder spoke about earlier.

And then all that information from all these models then go in to feed the total effects analysis.

And that concludes my presentation.

And I'm not sure if we have time for -- for another presenter, but if we do, it would be Miss Smith.

CO-HEARING OFFICE DODUC: Miss Smith, how long is your testimony?

WITNESS SMITH: My testimony is about half hour.

CO-HEARING OFFICER DODUC: Okay. Let me ask Miss Morris:

Your very, very short cross-examination, are your questions directed to Dr. Wilder, Dr. Greenwood and Mr. Reyes -- or Mr. Reyes?

MS. MORRIS: No. And I was just trying to use -- I'm sorry.

I -- I was thinking that this might be faster. So I was only trying to use time. I don't need any special accommodation. I was just saying that I'm available to do cross-examine today if we got to it.

CO-HEARING OFFICE DODUC: And here I was about to not grant you special accommodation, but thank you for clarifying.

Miss Smith, let's go ahead. If it's just half an hour, let's go ahead and get through your presentation, and then we will adjourn for the day.

WITNESS SMITH: Okay. Mr. Hunt, could you

bring up DWR-1027.

(Exhibit displayed on screen.)

WITNESS SMITH: And good afternoon, Hearing Officers.

CO-HEARING OFFICER MARCUS: Thank you for bringing that up.

WITNESS SMITH: I am the Chief of the Modeling support branch in -- in the Department of Water Resources. And prior to my position, I was the Chief of the Delta Modeling Section.

And I began working in the Delta Modeling Section in 1990, so I have extensive experience in the development, calibration, application and study results analysis of Delta hydrodynamic water quality and particle tracking models.

I work closely with and at times direct to DWR staff and consultants as related to the salinity and water level modeling that I'm going to be presenting today.

And so DSM-II was previously described in Exhibit DWR-66, so I'm not going to repeat that information.

And today, as I stated, the focus of my opinion's going to be on DSM-II salinity and water level modeling for the California WaterFix Project.

DSM-II receives its boundary conditions, primarily flow boundary conditions, from CalSim. So those conditions that Erik -- or Mr. Reyes described early what DSM-II uses, and the results of California WaterFix H3+, or CWF H3+, will be shown in comparison with the No-Action Alternative.

And as Mr. Reyes' did, the BA H3+, H3 and H4 are also shown in the plots for reference and to give context.

Could I go to Slide Number 2, please, Mr. Hunt.

(Exhibit displayed on screen.)

WITNESS SMITH: Thank you.

The first part of my opinion focuses on the compliance of CW -- or CWF H3+ with D-1641's fish and wildlife salinity objectives.

And as you're aware, these are the objectives for the protection of water fowl in Suisun Marsh and Striped Bass spawning areas in the areas of the San Joaquin River.

And the second part of my opinion focuses on salinity at D-1641 M&I and agricultural objective locations, and also at water level -- I'll have some water level results at a few locations within the Delta.

And the primary purpose of the second part of my opinion is to provide information to address public interest as it relates to salinity and water levels.

Could I go to Slide 3, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Okay. To give a summary of my opinion: For the Suisun Marsh fish and wildlife objectives, the results for CWF H3+ are similar to the No-Action Alternative.

For the fish and wildlife objective on the San Joaquin River Reach which stretches from Jersey Point to Prisoners Point, the model results indicate that the majority of the Reach located nearer to the ocean complies with the objective, but there is a smaller section of the Reach represented by Prisoners Point that shows modeling that at times does not comply with the objective.

And this is due to Lower Southern Delta exports in the spring, which are primarily a result of the higher March outflows, and -- and also to more restrictive OMR constraints in April and May under the California WaterFix H3+.

Because of these lower exports, land-based salts in the San Joaquin River are not exported in the model and could not be diluted by the fresher

Sacramento River water. And this is a modeling anomaly or artifact, and it will be explained later in more detail.

Could I go to Slide 4, please.

(Exhibit displayed on screen.)

WITNESS SMITH: At the D-1641 M&I and agricultural salinity locations -- objective locations, CWF H3+, the easy results generally fall in between H3 and H4. And the modeling results show that the objectives are met the majority of the time. And exceedances are primarily due to modeling anomalies, and it's not anticipated that the exceedances would occur in real-time operations.

And any small percentage of probability of exceedance is equal to or less than the No-Action Alternative, except at Emmaton, which has a slighter -- slightly higher probability.

Could I go to Slide 5, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Exceptions to the California WaterFix H3+ results falling between H3 and H4 occur when the higher spring outflow requirements resulted in less exports and, as a result, higher interior salinity south -- occurring south of the San Joaquin River.

And then also the removal of the export

constraints in the fall results in lower let -- net Delta outflow and, as a result, higher salinity coming in from the ocean.

The -- Just to be a little bit clearer, the -- the removal -- the No-Action Alternative does not contain the export constraints that the H3 and H4 have, and so that's why some of the results are -- are -- are similar to California WaterFix H3+.

And even with the lower net Delta fall -- the lower fall net Delta outflow, the current D-1641 objectives are still met.

And then, finally, water level results for the California WaterFix are similar to H3 and H4. And the differences in minimum water levels are greatest nearer the North Delta diversion location, which is expected, and occur during the higher flow periods.

Could we go to Slide Number 6, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Okay. Moving on to the details of my opinion.

I will start with the fish and wildlife objectives and then move to the results for public interest.

So, on Table 1, this shows -- it's just a -- a reference table, and it shows the objectives for the --

the fish and wildlife salinity objectives.

And I'm going to be focusing mostly on the Suisun Marsh objectives first -- first, which are the -- the lower left-hand corner of the -- the table.

So could I go to Page 7, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Or -- I'm sorry, yes. There we go.

So Figure L1 shows the locations of the Suisun Marsh objective locations.

I'm going to be starting with the Sacramento River at Collinsville and then moving upward and left when I present the results.

So could I go to Slide 8, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Thank you.

Starting on Page 8, the results are presented as a probability of compliance graphs. Only the results for the time periods when the objectives are in place are plotted.

The Y-Axis are the difference between the modeling results and the D-1641 objectives, similar to what Mr. Reyes had presented.

And when the results are less than zero, where that dotted dashed line is shown, the salinity values

are better or less than the D-1641 objective.

And when the results are greater than that -- where that dotted dashed line is shown, then the results are higher or worse than the objective.

The magenta line shows results for the CWF H3+ and the black line shows the results for the No-Action Alternative.

So, for the Sacramento River at Collinsville, Figure C1, the majority of the time, I'd say greater than 95 percent, the CWF H3+ results are better or meet the objective.

For the times that the results may indicate an exceedance of the objectives, the results for the No-Action Alternative and the California WaterFix H3+ are similar.

Go to Slide 9, please.

(Exhibit displayed on screen.)

WITNESS SMITH: The results for Montezuma Slough at National Steel, Figure C2, indicate that the results are better, better water salinity quality than the D-1641 objectives.

Slide 10, please.

(Exhibit displayed on screen.)

WITNESS SMITH: The salinity results at Montezuma Slough near Beldon's Landing, Figure C3, show

that more than 97 percent of the time the salinity is better or meets the objectives.

For the small percentage of time where CWF H3+ exceeds the objectives, both the No-Action Alternative and the California WaterFix H3+ results are similar.

Could you go to Slide 11, please.

(Exhibit displayed on screen.)

WITNESS SMITH: At Chadbourne Slough near Sunrise Duck Club, follow -- they -- that also follows a similar pattern as Montezuma Slough results.

Could you go to Page 12, please, or Slide 12, please.

(Exhibit displayed on screen.)

WITNESS SMITH: The results at Suisun Slough, 300 feet south of Volanti Slough, follow -- also follow a similar pat -- pattern as the previous graphs, with the small probability of -- possibility of exceeding the objectives.

So the exceedance in the Suisun Marsh salinity objectives are primarily -- sorry, it's late in the afternoon -- a result of modeling anomalies or artifacts that Dr. Nader-Terani described in Page 65, DWR-5 Errata, and in DWR-66, Page 8.

DSM-II exceedances are more likely more related to the differences between CalSim and DSM-II,

including the different time steps in each model.

In DWR-4 Errata, Page 18, Mr. Leahigh showed that State Water Project/Central Valley operations have met the objectives 98.9 percent of the time.

Both Mr. Leahigh and Mr. Miller explain -- or Mr. Miller will explain how operators observe the Delta system: Tides, inflows, diversions, exports, meteorological effects, and water quality stations, and adjust operations accordingly to avoid exceeding the objectives.

This cannot be fully approximated by the models.

Could I go to the next slide, please.

(Exhibit displayed on screen.)

WITNESS SMITH: The next objective I will cover is the San Joaquin River fish and wildlife quality -- wildlife water quality objectives.

The objective is along a segment of the San Joaquin River stretching from Prisoners Point to Jersey Point. And Figure L2 on Slide 13 shows the location of the objective.

The distance between Prisoners Point and Jersey Point is about 11 and three-quarters mile.

The distance between San Andreas Landing and Prisoners Point is approximately 3 miles.

The water in that segment can be a combination of San Joaquin flow flowing from the south to the north, then west, Consumnes and Mokelumne River flow flowing down into the north and south fork of the Mokelumne and then into Little Potato Slough, Sacramento River water flowing through the Cross Channel when opened into the north and south forks of the Mokelumne, and the Sacramento River flowing through Georgiana Slough and through the Sacramento River back east into the Delta with the tides, and then water flowing from the ocean and also in Delta sources. So that can make up the -- the water in those locations.

I'll show results from Jersey Point first and then I'll move westward to the San Joaquin River at San Andreas Landing and then to the San Joaquin River at Prisoners Point.

I will focus on CWF H3+ as the results to the No-Action Alternative, and the results are shown for the period that the objective is in place. So the .44 Millimhos per centimeter is in place, which is in April and May.

Operations have shown in -- as in Mr. Reyes' testimony, DWR-1028 and DWR-1016, for both the No-Action Alternative and the WaterFix H3+, the Cross Channel is closed, so there is no flow from the Sac

moving into the north and south -- south forks of the Mokelumne, and the S -- San Joaquin River IE ratio is included.

And then for the California WaterFix H3+ as compared to the No-Action Alternative, there are updated Spring Outflow Criteria not contained in the No-Action Alternative. And to me, the outflow requirement, as Mr. Reyes described previously, Delta exports are curtailed at times in the California WaterFix H3+, and we're seeing that primarily in March.

California WaterFix H3+ has a Head of Old River Gate that assumes 50 percent flow that would normally flow into Old River, moving into Old River, and there is no barrier for the No-Action Alternative.

So what I'm going to show is that the results at Jersey Point and San Andreas Landing, they contain more of the Sacramento fresher water.

And this -- And that's -- Those station results reflect water coming in from Georgiana Slough and then moving around through Three Mile Slough and into the San Joaquin River.

Prisoners Point modeling results will more reflect the flows from the Mokelumne, the San Joaquin River, the Consumnes and possibly other in-Delta sources.

Southern Delta exports downstream of the San Joaquin River at -- at the Head of Old River, if high enough, will normally move the higher salinity San Joaquin River water through the Head of Old River Turner Cut, Columbia Cut, Middle Rive and Old River. Without that movement, a portion of the water that would have been exported remains in the San Joaquin River.

So, sorry, I went on a bit with that. But let's move on to Slide 14, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Okay. So the salinity modeling results for the San Joaquin River at Jersey Point are shown here in Slide 14.

And, as you can see, based on my description before, the California WaterFix H3+ and the No-Action Alternative are better than the objectives so they meet or they're better than the objective.

So -- And also the difference between the No-Action Alternative and the California WaterFix H3+ -- so you're looking at the magenta line for the California WaterFix H3+ and the black line for the No-Action Alternative -- are reflective of increased land salts contained in the San Joaquin River.

So let's go to Slide 15, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Okay. Figure C7, San Joaquin River at San Andreas Landing.

Again, the results are generally fresher than Jersey Point due to fresher water source moving in from Georgiana Slough, and the -- the objective at San Andreas Landing is met for all alternatives.

Can we move on to Slide 16, please.

(Exhibit displayed on screen.)

WITNESS SMITH: At Prisoners Point, Figure C8, Page 16, the modeling results indicate that the California WaterFix H3+ alternative meets or is better than the objective more than 87 percent of the time.

The No-Action Alternative meets or is better than the objectives more than 97 percent of the time.

And since Prisoners Point is upstream of the San Andreas Landing and Jersey Point, it contains less ocean water, so the higher salinity values are reflective of land-based salts.

The difference between the No-Action Alternative and the H3 -- California H3+ results is primarily due to the reduction in Southern Delta exports to meet higher outflow requirements, and also stronger OMR constraints.

The exceedance occur primarily in dry years

when 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 at Prisoners Point.

Approximately 93 percent of the objective segments show results that meet or are better than the objective all of the time.

If looking at the objectives when they're -- they're met, it's about 2 miles of -- between San Andreas and Prisoners Point that -- where there would be exceedance the way the modeling is done. So about -- The other 7 percent, or about 2 miles, meets the objectives more than 87 percent of the time.

So this exceedance shown by modeling can primarily be addressed by -- in real-time operations.

Mr. Munivar and DWR-71, Page 5, described how CalSim II meets salinity requirements in the Delta.

Prisoners Point is not one of the locations that has a flow salinity relationship simulated and, therefore, was not captured by the modeling.

So this completes the part of my presentation of my opinion concerning the fish and wildlife objectives for salinity.

And so now I'm going to move on to results for public interest.

So if you could go to the next slide, please.

(Exhibit displayed on screen.)

WITNESS SMITH: And these plots are going to be shown to demonstrate the general changes to salinity in the Delta.

So Figure L3 shows the locations of the salinity results that I'm going to present, and they're going to be -- I'm going to present both monthly average salinity results and probability of compliance plots.

I will start in the west at the Delta at Emmaton. I'll move over to Jersey Point, then to San Andreas Landing, eastward to Terminous, then south to Old River at Tracy Road and Brandt Bridge, then the Contra Costa Canal, Clifton Court Forebay south and, finally, north to Barker Slough.

So could I go to slide 18, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Okay. Figure EC1, Page 18, shows the monthly average results for Emmaton. And we left the shaded area in as in Part 1, and that just represents a period without the D-1641 objectives.

The first black bar is the No-Action Alternative. The second light blue bar is H3. The third green bar is BA H3+. The fourth magenta bar is

the California WaterFix H3+. The fifth darker blue bar is H4.

And the purpose of these graphs is to show comparison of the results on a monthly basis. There is no indication in these plots on whether or not the alternatives are meeting the D-1641 objectives.

So, again, the magenta bar is the CWF H3+, and the black bar is the No-Action Alternative. And, generally, the California WaterFix H3+ results are similar to the No-Action Alternative.

During July, August and September, the California WaterFix H3+ is higher than the No-Action Alternative, closer in salinity values to H3 and H4.

There are differences for the California WaterFix H3+ as compared to H3 and H4 in October and November, which reflect changes in the export restrictions described by Mr. Reyes that resulted in a reduction in the Delta outflow.

The pattern between the California WaterFix H3+ and the No-Action Alternative are similar, as the No-Action Alternative also does not contain the export constraints.

Could I go to Page 19, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Thank you.

Okay. Figure EC2 shows results for Jersey Point.

The Cal -- The results for California WaterFix H3+ are similar or better than the No-Action Alternative.

For July, August and September, the California WaterFix H3+ results are better than the No-Action Alternative.

October and November results reflect a change in export restrictions with H3 and H4 and BA H3+.

Again, the pattern during October, November, is similar for California WaterFix H3+ and the No-Action Alternative due to both simulations not containing the export constraints.

Can I move on to Slide 20, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Okay. The Figure EC3 shows the salinity results for San Andreas Landing. And as we move inland into the Delta, EC scale is smaller. There are small differences between California WaterFix H3+ and the No-Action Alternative EC results. For example, the difference is less than 50 microsiemens per centimeter in October and November.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Figure EC -- EC4 shows the results for the monthly average EC at south fork Mokelumne River at Terminous.

And, again, the scale is -- is finer than what we were seeing before. Results are similar for California WaterFix H3+ and the No-Action Alternative.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Figure EC5 shows the EC results for Old River at Tracy Road in the Southern Delta. The EC results are, again, similar.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Moving just upstream of the Head of Old River on the San Joaquin River at Brandt Bridge, Figure EC6 also shows that the results are quite similar.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Figure CL1 shows chloride results for Contra Costa Canal, and you'll see differences within these results.

Results in November and December for CWF H3+ and the No-Action Alternative show generally similar monthly average values. California H3+ is slightly

higher than the No-Action Alternative in November, and in December, the California WaterFix H3+ is slightly lower.

The difference in November and December between CWF H3+ and H3 and H4 and the BA H3+ reflect the removal of the export constraints for California WaterFix H3+.

Can I go on to Slide 25.

(Exhibit displayed on screen.)

WITNESS SMITH: Thank you.

These are the results for the monthly average chloride concentration at Old River at Clifton Court. The results basically follow a similar pattern, as Clifton Court -- or as Contra Costa.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS SMITH: The results for Barker Slough in the North Delta are similar, as expected.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Okay. The next group of figures starting with Figure C9 at Emmaton show results from the same locations that I just showed with the monthly average plots, but these results are presented as proba -- probability of compliance graphs for

D-1641.

And, again, only the results that fall within the D-1641 objective compliance periods are plotted. And the Y-Axis values are the objective values subtracted from the results.

And any model results that are below the line, the red dotted dashed line, indicate better water quality or that they're meeting the objective.

So at Emmaton, the CWF H3+ model results meet the objective more than 80 percent of the time. And as stated previously, these exceedances are a result of modeling artifacts similar to what I stated previously.

And then Slide 28.

(Exhibit displayed on screen.)

WITNESS SMITH: Thank you.

At Jersey Point, Figure C10, Delta modeling results meet or are better than the objective more than 90 percent of the time. And the -- the California WaterFix H3+ meets the objective -- actually, more than meet -- No-Action Alternative.

Can I go to Slide 29, please.

(Exhibit displayed on screen.)

WITNESS SMITH: For Figure C11, San Andreas Landing, the California WaterFix H3+ shows results that the objective is met 100 percent of the time.

So can I go on to the next results -- or the next slide, please.

(Exhibit displayed on screen.)

WITNESS SMITH: At Termi -- Terminous, the California WaterFix H3+ are better than the D-1641 objects 100 percent of the time.

Could I go to the next slide, please.

(Exhibit displayed on screen.)

WITNESS SMITH: For Contra Costa Canal, results for CWF H3+ and No-Action Alternative are similar, meeting or better than the objective more than 92 percent of the time.

Could I go to the next slide, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Thank you, Mr. Hunt.

Figure C14 shows the number of days in a year meeting the mean daily 15-milligram per liter chloride objective at Contra Costa Canal Pumping Plant Number 1.

The blue area plot shows the D-1641 objectives. If the lines are above, the objective is met. If the lines are below, then the objective's being exceeded.

The DSM-II modeling results for CWF H3+ meets the objective except in the critical year 1977 along with the other alternatives plotted.

And, again, as previously explained by Dr. Nader-Terani in Part 1, the exceedances are mostly a result of differences in model assumptions and State Water Project CVP operations have been able to meet the regular -- regulatory obligations and achieve a high degree of compliance, as testified by Mr. Leahigh in Part 1.

Could I go to Slide 33, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Okay. This is the final area of my testimony.

And Figure L4 shows the -- the water level results that I'm going to present.

The plots I'll be showing are probability of exceedance plots, and I'm going to begin with the results from the locations that are closest to the Northern Delta intake. That's the -- the arrows pointing from the purple box there.

And then -- So I'll go just downstream south, then into Georgiana Slough, where the largest differences are anticipated to occur.

I'll then show results from Rio Vista, then Terminous and then, finally, Tracy Road.

So next slide, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Figure W1 shows the results at the Sacramento River downstream of the intakes.

The magenta line is the line with the other alternatives, H3, H4, BA H3+. The black line, the No-Action Alternative, is separate from the other lines.

The largest difference, as you can see, occurs in water levels when the stage is greater than 2 feet, so during the higher-flow periods.

And then during lower flows, the values shown towards the right of the graph, there's a much small -- smaller difference in water levels.

So could I go to Slide 35, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Figure W2 on Page 35 shows results for the Sacramento River downstream of Georgiana Slough.

The No-Action Alternative is the black line, and the other alternatives show similar results.

Again, the largest differences occur in water levels when the stage is greater than 1 or 2 feet. And then when the stage is below zero, the alternatives are similar to the No-Action Alternative.

Can I go to the next slide, please.

(Exhibit displayed on screen.)

WITNESS SMITH: Okay. For Figure W3 at Rio Vista, it's California WaterFix H3+ has similar results to the No-Action Alternative.

Slide 37, please.

(Exhibit displayed on screen.)

WITNESS SMITH: And then for the location at Terminous, again, the Cal -- CWF H3+ is in line with the No-Action Alternative.

And then Page 38 or Slide 38.

(Exhibit displayed on screen.)

WITNESS SMITH: And for Figure W5 at Old River at Tracy Road, California WaterFix H3+ runs similar to the No-Action Alternative results.

And I think I probably got through it a lot quicker than the half hour, so that concludes the -- my opinion.

CO-HEARING OFFICE DODUC: Thank you very much.

Miss Nikkel.

MS. NIKKEL: Meredith Nikkel on behalf of North Delta Water Agency.

I'm going to move to strike but I would love to be proved wrong.

When Miss Smith was discussing or testifying on Slide 16 regarding Prisoners Point --

CO-HEARING OFFICE DODUC: Let's wait and let's

go back to Slide 16, please.

MS. NIKKEL: And I apologize for the delay but I was checking my notes, so . . . and the written testimony.

(Exhibit displayed on screen.)

MS. NIKKEL: I heard Miss Smith to testify regarding 93 percent compliance in an area 2 miles above San Andreas, as well as 7 percent and 83 percent of the time. And I didn't see that in her written testimony, so I would -- I would move to strike on the basis that it's improper surprise testimony unless I'm incorrect, and I would love to be proven wrong.

CO-HEARING OFFICE DODUC: Miss Smith.

WITNESS SMITH: It was not in my written testimony. I did not put the -- the distance between the -- the locations within my written testimony.

CO-HEARING OFFICE DODUC: Is it the outgrowth of information elsewhere in the record?

WITNESS SMITH: It . . . I'm -- I'm not -- I'm not sure. I mean, it's just -- It's -- It's information that is probably available in the modeling results.

MS. NIKKEL: I'm not actually referring to the -- the mile -- the 2 miles. It's the percentages, and the compliance percentages that I didn't see in the

written testimony.

WITNESS SMITH: Okay. Well, the compliance presented -- percentages --

CO-HEARING OFFICE DODUC: Are on the chart.

WITNESS SMITH: -- are on the graphics so I'm describing what I'm seeing in the tables.

CO-HEARING OFFICE DODUC: Miss Nikkel, are you contesting the percentages Miss Smith cited as being not too effective in the chart?

MS. NIKKEL: They're different than the written testimony.

But if the -- if the testimony is that it's just -- she's interpreting the chart --

CO-HEARING OFFICE DODUC: That's my understanding.

MS. NIKKEL: -- then that clarification is helpful.

CO-HEARING OFFICE DODUC: Miss Smith.

WITNESS SMITH: That -- That's correct, yeah.

MS. NIKKEL: Okay. Thank you.

CO-HEARING OFFICE DODUC: You are withdrawing, then, your objection?

MS. NIKKEL: I'll withdraw the -- the motion.

Thank you.

CO-HEARING OFFICE DODUC: Thank you very much.

All right. Let's go ahead and stop before anyone else comes up with anything else.

Thank you, everybody. We will see you in Rancho Cordova at 9:30 on Monday.

(Proceedings concluded at 4:24 p.m.)

State of California)
)
County of Sacramento)

I, Candace L. Yount, Certified Shorthand Reporter for the State of California, County of Sacramento, do hereby certify:

That I was present at the time of the above proceedings;

That I took down in machine shorthand notes all proceedings had and testimony given;

That I thereafter transcribed said shorthand notes with the aid of a computer;

That the above and foregoing is a full, true, and correct transcription of said shorthand notes, and a full, true and correct transcript of all proceedings had and testimony taken;

That I am not a party to the action or related to a party or counsel;

That I have no financial or other interest in the outcome of the action.

Dated: March 2, 2018

_____
Candace L. Yount, CSR No. 2737