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 REBUTTAL

Friday, August 24, 2018

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

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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:

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

Kevin Long
Megan Raisis

PART 2 REBUTTAL

For Petitioners:

California Department of Water Resources:

James (Tripp) Mizell, Senior Attorney
Jolie-Anne Ansley

Duane Morris LLP
By: Thomas Martin Berliner, Attorney at Law

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

Amy L. Aufdemberge, Assistant Regional Solicitor

APPEARANCES (Continued)

FOR PROTESTANTS AND INTERESTED PARTIES:

For The Environmental Justice Coalition for Water; Islands, Inc.; Local Agencies of the North Delta (LAND); Bogle Vineyards/Delta Watershed Landowner Coalition; Diablo Vineyards; and Brad Lange/Delta Watershed Landowner Coalition; Stillwater Orchards/Delta Watershed Landowner Coalition; Brett G. Baker and Daniel Wilson; SAVE OUR SANDHILL CRANES; Friends of Stone Lakes National Wildlife Refuge; The County of Yolo:

Osha Meserve

For Sacramento Regional County Sanitation District and City of Stockton:

Kelley Taber

For City of Antioch:

Matthew Emrick

For California Water Research:

Deirdre Des Jardins

I N D E X

W I T N E S S E S

SACRAMENTO REGIONAL COUNTY SANITATION DISTRICT'S:

E X H I B I T S

CITY OF ANTIOCH'S

CITY OF STOCKTON'S

Friday, August 24, 2018 9:30 a.m.

PROCEEDINGS

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CO-HEARING OFFICER DODUC: Good morning, everyone. Welcome back to this Water Right Change Petition hearing for the California WaterFix Project.

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

To my left are Andrew Deeringer, Conny Mitterhofer and Jean McCue.

We're also being assisted today by Mr. Long and Miss Raisis.

It's Friday. I see one, hmm, kind of new face.

(Laughter.)

CO-HEARING OFFICER DODUC: Well, since you are sitting next to Miss Meserve, I -- she will tell you all about the three important announcements that you should know.

But I will just say that the most important one is: Take a moment right now and put all your noise-making devices to silent, vibrate, do not disturb.

All right. A couple housekeeping matter before we get to Dr. Paulsen.

Dr. Paulsen, you are our only witness today, and we hope to be able to go through your testimony and cross-examination on behalf of three parties: Sac Regional, City of Stockton, City of Antioch.

The cross-examination I have for Dr. Paulsen -- this was awhile ago -- but the estimate was two hours total for all three by DWR; then Mr. Herrick requested, on behalf of South Delta, 20 or 30 minutes; CSPA said that he had -- Mr. Jackson said he had a total of 60 minutes; and Miss Des Jardins requested 30. That was all the cross-examination that was made for Dr. Paulsen.

Mr. Mizell.

MR. MIZELL: Yes. I'd like to update our estimate.

CO-HEARING OFFICER DODUC: Please.

MR. MIZELL: We should probably only be about 65 minutes, so an hour, just over an hour.

CO-HEARING OFFICER MARCUS: Very precise, 65. You're going to have to teach me how to time these estimates.

MS. MESERVE: Good morning. I would also like to request cross-examination in the LAND space of the

lineup, which I believe is Group 19, for 30 minutes.

CO-HEARING OFFICER DODUC: All right. So, then, when we return on Monday, I believe we received a request this morning for -- oh, Miss Meserve, you're here, excellent -- for Group 48, 31 and 37, I believe -- is that correct, Miss Meserve -- to switch places with Group 41, Snug Harbor, in the order of rebuttal presentation?

MS. MESERVE: Yes. We've conferred with all the parties and we're still just trying to move that panel up a little bit in the lineup due to some travel plans of the panelists. So we're hoping to be able to put them on on Tuesday and then have things laid out.

CO-HEARING OFFICER DODUC: Okay. So on Monday, we will begin with -- I believe it's Save the California Delta Alliance; moving on to PCFFA and LAND, that panel of three; then North Delta C.A.R.E.S; and either Snug Harbor or Save our Sandhill Crane, CSPA and DDJ panel, depending on when we get to them; and then Clifton Court; County of Sacramento.

I don't have the latest one but I think then we revisit -- we go back to Mr. Burke, I believe it was; and then on behalf of CSPA, County of San Joaquin and LAND, Mr. Stroshane and Nakagawa.

Is that everyone's understanding?

MS. MESERVE: That sounds correct. The only little detail I would add is that the way Ms. Des Jardins' letter read yesterday, she was requesting to trade places with Snug Harbor.

So that would put Snug Harbor, I guess, after, I don't know, maybe County of Sac or something like that. I think we're flexible. Nicki's been very flexible on where to go.

And then, yes, Mr. Nakagawa is attempting to get back out from the hurricane, so we'll keep you posted.

CO-HEARING OFFICER DODUC: All right. What I would like to do, since this looks like a fairly not large crowd here today is:

On Monday, when we resume, I would like to get a total estimate of cross-examination for all the remaining parties.

Obviously, as you know, we only have hearing dates announced until the end of next week. So, on Monday, I hope to be able during our closed session to discuss the calendar, and I want to go into that closed session with a good idea of what remaining cross-examination we have.

I recognize that we also have a pending ruling with respect to three of Petitioners' witnesses, and we

will make that announcement hopefully later today. And we will find a way to determine how they fit in the schedule and, again, whether or not we need to schedule an additional few days to complete this Part 2 Rebuttal phase.

So, with your cooperation on Monday, I'd like to spend a little bit of time at the beginning of the day going through scheduling and timing and what not.

Okay. Anything else?

If not, then we'll turn it to Mr. Emrick, Miss Taber, and Dr. Paulsen.

MS. TABER: Good morning. Mr. Emrick is sitting up here but we were proposing to just go in our group order with Dr. Paulsen presenting her testimony for Sacramento Regional County Sanitation District, then conduct -- parties conducting cross-examination, then following with Stockton and Antioch in the same format rather than have her present all three --

CO-HEARING OFFICER DODUC: Okay.

MS. TABER: -- Protestants' testimony at once.

CO-HEARING OFFICEER DODUC: And, actually, before you begin, I just remembered another housekeeping matter.

Last week, I believe, it was Miss Des Jardins who made a request with respect to one of her witnesses

who has to travel up here, and she requested that, if there were any objections to his testimony, that she be made aware of them before her witness traveled here.

MS. ANSLEY: I --

CO-HEARING OFFICEER DODUC: We --

MS. ANSLEY: I'm sorry.

CO-HEARING OFFICEER DODUC: Miss Ansley.

MS. ANSLEY: I apologize. I missed the witness' name.

CO-HEARING OFFICEER DODUC: I believe it was -- No, she did say. Mr. -- Dr. Thomas Williams.

MS. ANSLEY: Oh. So this was -- this was from Dierdre's -- Dierdre's letter?

CO-HEARING OFFICEER DODUC: I don't know that it's from her -- No. She made the request verbally during -- orally during a hearing day.

MS. TABER: I believe her request was a Motion to Strike in its entirety such that he might come all the way to Sacramento and not be allowed to testify.

CO-HEARING OFFICER MARCUS: Right. We're getting more of those.

CO-HEARING OFFICEER DODUC: Yes. And, so, again, since we're looking at only five -- after today -- noticed hearing days, you -- let us discuss that and give you some direction by the end of the day.

But I think, with respect to the remaining witnesses, I would like to receive any objections to, for example, the entirety of their testimony, to have that before they appear. So that might be Monday as well.

Let me ask this: Given that we are expecting to have Save the California Delta Alliance, PCFFA, North Delta C.A.R.E.S, and perhaps even as far as Snug Harbor on Monday, are there any objections to strike the entirety of any witness' testimony?

MS. ANSLEY: If you'd give us just a -- Yeah. I believe -- And the problem is that, you know, this has obviously been speeding very, very fast, so we do have significant objections to some of those witnesses' testimony.

As we stand here right now, we don't believe it's in their entirety.

I'm a little worried about Dr. Williams. I think the problem is that, you know, we have written those objections out for our own purposes in note form. We do not have written pleadings of Motion to Strike, obviously, since we intended, as directed, to -- to bring them on the spot.

I do believe --

CO-HEARING OFFICEER DODUC: I think for now,

Miss Ansley, at least for today, all I'm seeking from Petitioners or any other parties, for that matter, is any potential objection/Motion to Strike a witness' entire testimony, or close to, just give us that heads-up today. Then we will decide what the best way is to proceed.

And I don't mean right now.

MR. BERLINER: Yeah.

CO-HEARING OFFICEER DODUC: Just sometime today.

MR. MIZELL: Yes. We will confer with some of the folks who are working on those notes, and we can maybe have a better answer after the lunch break, if we go that long --

CO-HEARING OFFICEER DODUC: Okay.

MR. MIZELL: -- maybe right before lunch if we're going to break early.

CO-HEARING OFFICEER DODUC: All right. Thank you. Apologies.

Back to you, Miss Taber.

MS. TABER: Good morning. Kelley Taber on behalf of the Sacramento Regional County Sanitation District, Group 13.

First of all, I'd like to thank the Hearing Officers and the parties for accommodating our request

to schedule Dr. Paulsen on a specific day and all on one day. We know there's a lot of moving parts to the proceeding. We very much appreciate that accommodation.

This morning, Dr. Susan Paulsen will be presenting her rebuttal testimony.

Susan Paulsen,

called as a witness by the Sacramento Regional County Sanitation District, having previously been duly sworn, was examined and testified further as follows:

DIRECT EXAMINATION BY

MS. TABER: Dr. Paulsen, can you please state your name for the record.

WITNESS PAULSEN: My name is Susan Paulsen.

MS. TABER: And you've taken the oath in this proceeding; correct?

WITNESS PAULSEN: I have.

MS. TABER: Dr. Paulsen, is Exhibit SRCSD-39 a true and correct copy of your testimony for this Part 2 Rebuttal?

WITNESS PAULSEN: Yes, it is.

MS. TABER: And have you previously submitted

your qualifications in this proceeding?

WITNESS PAULSEN: Yes.

CO-HEARING OFFICEER DODUC: Did you rely on Exhibit SRCSD-40 in presenting your testimony for this Part 2 Rebuttal?

WITNESS PAULSEN: Yes, I did.

MS. TABER: And is Exhibit SRCSD-41 a PowerPoint presentation that summarizes your written testimony?

WITNESS PAULSEN: Yes.

MS. TABER: Thank you, Dr. Paulsen.

Would you please now summarize your testimony.

WITNESS PAULSEN: Would it be possible to have SRCSD-41 brought up, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: Thank you.

Regional San -- The Sacramento County Regional Sanitary District I'll refer to as Regional San.

They retained Exponent to evaluate the impacts of scenario CWF H3+ on their operations and permit conditions.

Our evaluation was similar to the evaluations that we presented in the Part 2 case in chief for other scenarios. And so what we've done is just to supplement those results with the new results for

CWF H3+ in an effort to streamline things.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: We have two opinions to present today.

Sorry. Next slide.

(Exhibit displayed on screen.)

WITNESS PAULSEN: Thank you.

The first opinion has to do with the frequency and the duration of the diversion events that occur when flows in the Sacramento River either slow down or reverse.

And the second opinion has to do with the water quality impacts within the Delta of the CWF H3+ scenario.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: And, actually, we can skip to the next one as well.

(Exhibit displayed on screen.)

WITNESS PAULSEN: What we did to evaluate the reverse flow events for Scenario CWF H3+ was to use the same methods that were previously described in the case in chief in SRCSD-31.

And, in a nutshell, our conclusions are that

the impacts to operations would be similar to those previously evaluated for scenarios H3 and H4.

And a little bit of detail is included on the next slide.

(Exhibit displayed on screen.)

WITNESS PAULSEN: So, this table should look familiar, I think. All of the columns of information have been presented before. The new column is the far right column, which presents the results for CWF H3+.

This table presents results for a number of metrics that Regional San uses to evaluate reverse flow events and the impact on its operations.

What you can see is that the impacts from CWF H3+ are similar to those for scenarios H3 and H4. And all of these scenarios show an increased frequency of diversion events relative to both existing conditions, which is the EBC2 column, and the No-Action Alternative, which is the NAA column.

Specifically, CWF H3+ results in 1,298 additional diversion events relative to the EBC2, so that's an increase of 40 percent.

Diversions would be required 8.7 percent of the time under H -- CWF H3+, and that's compared to 5.6 percent of the time for EBC2. And that's an increase of 55 percent in terms of the frequency of

diversions.

Effluent would be stored in the emergency storage basins 17.8 percent of the time for CWF H3+, which is compared to 11.8 percent of the time for the existing condition EBC2 run. That's an increase of 51 percent.

And the cumulative volume stored in the ESBs over the 16-year model period would increase to 96.9 billion gallons as compared to 63.9 billion gallons for the EBC2 condition. That's an increase of 52 percent.

And then the next slide shows --

(Exhibit displayed on screen.)

WITNESS PAULSEN: -- the relative -- Oops, I'm sorry. Back one.

(Exhibit displayed on screen.)

WITNESS PAULSEN: This shows the relative percent increases in these parameters for all of the scenarios as compared to the existing condition EBC2.

And you can see, for all of the WaterFix scenarios relative to existing conditions, the increases in the various parameters are between 44 percent and 59 percent.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: So, as was outlined in the Part 2 case in chief, the increase in the number and the magnitude of diversion events increases the operations and maintenance costs for the Treatment Plant and reduces the Treatment Plant's operational flexibility.

So, just as a reminder, the emergency storage basins were designed by Regional San for future conditions that at the time of their design did not include WaterFix.

So, the volumes of those basins were chosen in such a way that it would meet the plant's needs for future operations and for contingencies. And WaterFix, in effect, takes up a portion of that design capacity such that Regional San will lose a portion of that operational flexibility.

The next slide --

(Exhibit displayed on screen.)

WITNESS PAULSEN: -- has to do with the impacts of the CWF H3+ scenario, residence time, Microcystis -- potential for Microcystis growth, and salinity relative to the other WaterFix Project scenarios.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: So, we detailed . . .

Regional San's testimony comes first, but the different testimonies are somewhat interrelated. We were trying to streamline things and not repeat information throughout all of the testimony.

So I'd like to reference Stockton's Part 2 Rebuttal testimony, which is in Stockton-61. That information demonstrates that the CWF H3+ scenario will result in increased residence times within the Delta, similar to H3 and H4, and those increases are relative to both the existing condition (EBC2) and the No-Action Alternative (NAA) and occur in all water year-types.

The greatest increase in residence times, in addition, is in the warmest months. And higher residence times will result in degraded water quality within the Delta and an increased potential for Microcystis growth, which is also detailed on the next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: Higher residence times correlate with reduced flushing in the interior Delta and that, in turn, can correlate with increased temperatures in the interior Delta, both of which increase the likelihood of Microcystis blooms.

And this is particularly concerning because

the residence times are increased the most in the months that are the warmest when Delta water temperatures are already higher, which altogether combines to results in increased likelihood of Microcystis blooms.

The impacts to Regional San and to the Treatment Plant are that, because Regional San's discharges are to the Delta, there's the potential that degraded water quality within the Delta will result in more stringent Permit restrictions on the discharges that Regional San makes through its diffuser to the Delta.

And the last slide -- the next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: Again, looking at testimony submitted by Antioch and Stockton which details the increases in salinity, Scenario CWF H3+ is expected to change the composition and the quality of water within the Delta.

We know that, under most -- many of these scenarios, more water and more Sacramento River water will be diverted from the Delta. And because of the increased residence times, flushing in the interior of the Delta will decrease.

So, again, the concern is that degraded water

quality within the Delta in the form of higher salinity, increased residence times, increased temperature, has the potential to lead to more restrictive NPDES permit conditions.

And that concludes the summary.

Thank you.

CO-HEARING OFFICEER DODUC: Thank you.

Miss Taber, Mr. Emrick, are you suggesting that we now go to cross-examination based on this particular direct testimony from Dr. Paulsen, or might we have her present all three direct testimony and then do cross-examination on all three?

MS. TABER: We felt it might be cleaner for her to go -- take them individually rather than have her present them altogether in terms of the record and the transcripts later.

I also didn't know if parties who might have cross-examination, for example, for Antioch were planning to come later in the day based on the cross-examination estimates that we had.

CO-HEARING OFFICEER DODUC: I ask because, obviously, in her testimony, she referenced other testimony from the other two parties.

So any thoughts?

MS. ANSLEY: I think that the DWR is fine with

that -- proceeding in that vein. I will just note, though, however, that Mr. Mizell --

CO-HEARING OFFICEER DODUC: I'm sorry. Which vein?

MS. ANSLEY: In doing it separately is fine if Miss Taber would prefer it that way. We do feel that the testimony is pretty intertwined between Sac Regional and Stockton, obviously. She noted it herself.

So, I beg a little indulgence if one of our two questions seems similar only because Mr. Mizell and I took different parties. But I believe we've got it down to very few questions.

CO-HEARING OFFICEER DODUC: All right.

MS. TABER: Well, we're amenable to going in any order that is your preference. It really doesn't matter to Dr. Paulsen, and she's prepared to present Stockton's testimony right now if you think it would be -- make things more clear.

CO-HEARING OFFICEER DODUC: Because I think everyone had requested cross-examination time as one block -- well, with the exception of Mr. Jackson, who requested three blocks of 20 minutes each -- it might be to easier just go through the entirety of Dr. Paulsen's direct and then get to cross.

MS. TABER: Just, if you'll allow us just a minute to --

CO-HEARING OFFICEER DODUC: Sure.

MS. TABER: -- change gears here.

(Pause in proceedings.)

CO-HEARING OFFICEER DODUC: Miss Meserve.

MS. MESERVE: Good morning.

Yeah. Just while we're getting ready, Mr. Jackson will not be here today. Thank you.

CO-HEARING OFFICEER DODUC: All right. We might be able to get through fairly quickly, although we all miss Mr. Jackson, of course.

MS. TABER: Thank you.

Okay. Turning to Dr. Paulsen. Your testimony on behalf of the City of Stockton, Group 22.

Is Exhibit STKN-61 a true and correct copy of your testimony for this Part 2 Rebuttal?

WITNESS PAULSEN: Yes.

MS. TABER: And did you rely on Exhibits STKN-62, -63, -64 and -65 in preparing your testimony for this rebuttal?

WITNESS PAULSEN: Yes, I did.

MS. TABER: And is Exhibit STKN-66 a PowerPoint presentation that summarizes your testimony for Stockton?

WITNESS PAULSEN: Yes.

MS. TABER: Thank you.

Can you please summarize your testimony.

WITNESS PAULSEN: Sure.

Would it be possible to bring up STKN-66, please.

MS. TABER: 66.

(Exhibit displayed on screen.)

WITNESS PAULSEN: Thank you.

All right. Next slide.

(Exhibit displayed on screen.)

WITNESS PAULSEN: Thank you.

Similar to what we just discussed for Regional San, for Stockton, in the Part 1 case in chief, we examined the water quality impacts of scenarios H3, H4, Boundary 1 and Boundary 2 and, in Part 2, we've supplemented that analysis by adding the new scenario CWF H3+.

And that differs from the other operational scenarios in a -- in several ways, including that the CWF H3+ scenario includes higher spring outflow requirements, which are met by reducing South Delta exports so that less Sacramento River water is moved through the Delta.

Another difference is that the fall export

restrictions are removed, which results in lower net Delta outflow and higher salinity in the fall and winter months.

So, in this testimony, we will look at the water quality impacts of CWF H3+ focusing as we did in the case in chief on salinity residence time, temperature and the potential for Microcystis blooms.

So, in summary, at Stockton's intake, the CWF H3+ is expected to have greater impacts with respect to salinity than the other Project scenarios, and comparable impacts with respect to residence time and temperature.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: In Part 1, we evaluated the salinity impacts at Stockton's intake by counting the total amount of time that chloride concentrations exceed the city's operational threshold of 110 milligrams per liter.

And we've done the same thing here. And the column on the right adds the results for the CWF H3+ scenario. And the row along the bottom adds all of the -- the number of days of exceedance for all of the scenarios over the 16-year model period.

The columns are ordered in the order of the

number of days of exceedance as well. So the leftmost column, the existing condition EBC2 run had a total of 454 days of exceedance in the 16-year period, followed by the others. And then on the right side, the CWF H3+ scenario, which had a total of 848 days of exceedance of that chloride threshold.

So, what you see is that relative to the EBC2 existing condition run, Scenario CWF H3+ increases the time that Stockton can't use water at its intake because it exceeds the threshold by 87 percent.

Relative to the No-Action Alternative, the CWF H3+ scenario increases the number of exceedance days by 48 percent.

Relative to the Boundary 1 scenario, the CWF H3+ scenario increases the number of days by 35 percent.

And relative to the Boundary 2 scenario, which we had previously described as the one that resulted in the highest salinity increases at Stockton's intake, relative to that Boundary 2 scenario, the CWF H3+ scenario increases the number of days by 12 percent.

So, again, the CWF H3+ scenario shows that the water at Stockton's intake will exceed that threshold more frequently than the other scenarios that have been evaluated to date.

The next -- next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: Thank you.

In DWR-1035, DWR concluded that the in-channel velocities, and they said all technical assessment findings and conclusions for CWF H3+ would be similar to the conclusions for scenarios H3 and H4.

But DWR's velocity analysis looked at 16-year cumulative probability diagrams that, as we previously discussed, did not fully consider the sloshing nature of flows within the Delta.

So what we did here was to also calculate a generalized measure of residence time for CWF H3+, as we did for the other scenarios.

And what we see is that -- The prior scenarios that we had evaluated had increased the residence times for the WaterFix scenarios by up to about 37 percent. And the greatest increases were in the months July, August, September and October, which is when the water temperatures in the Delta generally are highest.

For the Part 2 -- this Part 2 Rebuttal testimony, we repeated that analysis for the CWF H3+ scenario and confirmed that the increases in residence time under that new scenario will be similar to the increases that we saw for the other WaterFix scenarios.

Again, we expect to have the -- the scenario CWF H3+ impacts with respect to residence time and the associated potential for Microcystis growth to be similar to the other scenarios.

And the next slide, please, last slide.

(Exhibit displayed on screen.)

WITNESS PAULSEN: We've already discussed that increased residence times will reduce flushing and are likely to lead to increased water temperatures within the Delta.

With respect to temperature, to my knowledge, I don't believe DWR has simulated water temperatures for the CWF H3+ scenario and, instead, they relied upon simulation results for BA H3+.

And we've already discussed this, but we had a concern with the way in which those temperature results were presented in terms of monthly averages and long-term period statistics.

Water temperature's a function of many factors, including solar radiation, air temperature, wind speed, humidity. And daily, weekly and monthly temperatures are expected to fluctuate significantly compared to 82-year averages and compared to the average temperature within a month.

DWR's temperature analysis was also for two

future conditions: The No-Action Alternative and the BA H3+ scenario. And so we don't have an existing-condition temperature run that we can compare to.

But what we do know is that Microcystis blooms occur now fairly frequently in the Delta. And the screenshot, the picture on the right, was a screenshot that we took pretty much when this testimony was submitted that showed that there were Microcystis blooms that were occurring in the Delta recently. So we know that blooms are now occurling (sic) -- occurring fairly frequently and occurring with greater frequency over time.

And so the conclusions that we presented in the Part 2 case in chief for Stockton-26 remain applicable to this scenario.

The CWF H3+ scenario and all of the WaterFix scenarios are expected to result in longer residence times in the Delta in all year-types, which may lead to increased water temperatures and lower flushing and, in turn, leading to an increased likelihood of Microcystis blooms with the Project.

CO-HEARING OFFICEER DODUC: Please hold on, Dr. Paulsen.

Miss Ansley.

MS. ANSLEY: Yes. And I realize this is a belated objection, so this is now the form of a Motion to Strike testimony.

I believe that the detail that Dr. Paulsen just went into regarding Microcystis is neither in her Stockton-61 testimony on Page 7 or on the slide in front of you.

So, you know, usually Dr. Paulsen is right on her slides, and perhaps I should have been paying better attention as she was speaking. But in terms of current occurrences of Microcystis and trends in Microcystis, these are not in either that slide or this testimony.

CO-HEARING OFFICEER DODUC: I thought she made that statement in reference to the image captured here.

MS. ANSLEY: And that's fine. I see the image there.

I do think that she did go on to provide more detail and more testimony. And, typically, we've had issues with that in the past where, if someone's talking about trends in Microcystis, or someone is talking about -- I mean, I do see the recent occurrences.

But I do believe that a lot more detail was just in the last couple minutes of testimony regarding

Microcystis in the Delta than is presented in this or her testimony.

And I'm fine with your ruling on that, but that's my objection for the record.

CO-HEARING OFFICEER DODUC: All right. Miss Taber, do you wish to respond?

MS. TABER: Well, Dr. Paulsen's testimony summarizes her previous testimony in relation to CWF H3+.

It references the prior testimony for efficiency and purposes of drawing a conclusion about the impacts of CWF H3+.

And all of the information that's presented in the slides is in the prior testimony that she cites as a basis for her opinion about CWF H3+.

WITNESS PAULSEN: With the exception of this slide. This was -- The figure --

CO-HEARING OFFICEER DODUC: The figure.

WITNESS PAULSEN: -- on this slide wasn't in previous testimony because it was just captured, downloaded from the web.

CO-HEARING OFFICEER DODUC: Exactly.

Objection noted but overruled, Miss Ansley.

WITNESS PAULSEN: Thank you.

I think that concludes -- sorry -- the summary

for the Stockton testimony.

MS. TABER: Thank you.

CO-HEARING OFFICEER DODUC: Moving on to Antioch.

MR. EMRICK: Good morning, Board, staff. Matthew Emrick, City of Antioch.

I'm going to have Dr. Paulsen provide some testimony with respect to rebuttal for City of Antioch.

DIRECT EXAMINATION BY

MR. EMRICK: Dr. Paulsen, Antioch-600, that's a true and correct copy of your written testimony?

WITNESS PAULSEN: Yes, it is.

MR. EMRICK: And Antioch Exhibit 601 is a PowerPoint that summarizes that testimony?

WITNESS PAULSEN: Yes.

MR. EMRICK: And then Exhibit 602, those are charts and graphs in support of your testimony regarding Delta exports?

WITNESS PAULSEN: Yes, that's correct.

MR. EMRICK: And you created that document?

WITNESS PAULSEN: Yes.

MR. EMRICK: And it's incorporated into your testimony?

WITNESS PAULSEN: Yes.

MR. EMRICK: Can we have you summarize your

findings and testimony with respect to the City of Antioch.

WITNESS PAULSEN: Yes. Would it be possible to have the slides for Antioch 601, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: All right. I think we can go to the next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: Thank you.

For Antioch's Part 2 case in chief, we developed four opinions.

And for this testimony, again, as with the other two pieces of testimony, we extend -- expanded that analysis to look at the new scenario CWF H3+ and developed three new opinions which we've just numbered sequentially, so it's 5, 6 and 7. And they deal with salinity impacts, the amount of water exported from the Delta, and then the adaptive management of the Project operations as well.

So, the major changes in operations for CWF H3+ include changes to the OMR requirements. So, for CWF H3+, the OMR requirements for October and November are defined by the No-Action Alternative, and for the other months, they're defined by H3.

The South Delta export restrictions were

removed for the months of October and November for Scenario CWF H3+, which results in lower net Delta outflow and higher salinity in the fall and winter.

And then the screen Delta outflow requirements are higher for CWF H3+ than for the other Project scenarios, which results in less water exported from the South Delta and higher salinity in portions of the Delta.

So those are the major operational changes that affect water quality at Antioch.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: So the -- Opinion 5 will look at salinity in the Western Delta and at Antioch's intake location through a few different steps and, again, building on the prior testimony.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: The -- The first thing that we did in evaluating the impacts of CWF H3+ was to look at DWR's analysis of that scenario.

And this slide is a screenshot from DWR-1015, their Figure CL1, which shows 16-year average monthly chloride concentrations at Contra Costa Canal.

And Contra Costa Canal is located in the

Western Delta and is also one of the main sources of water -- Supplemental water for the City of Antioch. When water at their own intake is too salty for use, they purchase Supplemental water, much of which comes through this location.

What this slide shows is the -- again, the 16-year monthly average chloride concentrations for five different scenarios. There's the No-Action Alternative, H3 and H4, and then the BA H3+ and the CWF H3+.

So the CWF H3+ scenario is the pink bar.

And what we see is that in a number of months, the 16-year average monthly chloride concentration for CWF H3+ is higher than it is for the other Project scenarios and for the EBC2 and the No-Action -- sorry -- for the -- they didn't evaluate EBC2 -- for the No-Action Alternative.

And, specifically, it is higher than all the other Project scenarios in seven of the 12 months, so that's 58 percent of the months of 16-year average monthly concentrations.

And the chloride concentrations for CWF H3+ are higher than the No-Action Alternative in five of 12 months, so that's 42 percent of the months.

So this by itself indicates that the chloride

concentrations in the Western Delta are likely to be higher under the CWF H3+ operations than the other scenarios that were evaluated.

The next thing we did was to use the model results, DSM-II model output, for CWF H3+ --

And, I'm sorry, next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: -- to evaluate the salinity at Antioch's intake.

So we had previously in the Part 2 case in chief presented some colored bar charts that looked like this that look at different hydrologic exceedance frequencies and that can be used to graphically dispay (sic) -- display the periods of time when water at Antioch's intake will have a salinity -- or a chloride level of less than 250 milligrams per liter at slack current after higher high-tide, which is how usable water is defined in Antioch's 1968 agreement.

We discussed in the Part 2 case in chief that the Boundary 2 scenario was the scenario that had the freshest water and -- but was still significantly saltier than salinity levels that were observed prior to about 1920.

It may be most useful --

If you'd go to the next slide.

(Exhibit displayed on screen.)

WITNESS PAULSEN: We also tabulated the results with respect to the hydrologic exceedance frequency data.

I'll skip over this in the interest of time. There's more information on the next slide --

(Exhibit displayed on screen.)

WITNESS PAULSEN: Thank you.

-- which summarizes the number of days of usable water, as defined by the 1968 agreement, for each of the water years and for each of the scenarios that we evaluated.

So, here, all of the information on this slide was presented previously, except we added results for CWF H3+ -- that's the middle column -- and for the BA H3+ scenario. That's two to the right of the CWF BA H3 -- sorry -- the BA H3 -- The BA H3+ is two columns to the right of the CWF H3+. Sorry.

So what we see is, for the 16-year period as a whole, the existing conditions EBC2 scenario has 1,968 days of usable water. The No-Action Alternative has 1,878 days of usable water. CWF H3+ has 1903 days. And the Boundary 1 scenario has the greatest increase in salinity and the fewest number of usable days with 1538 days of usable water.

So, with respect to the other scenarios, the CWF H3+ scenario has 327 fewer days of usable water than Boundary 2 and is more comparable to the H3 and H4 scenarios. It has one fewer day -- one less day of usable water compared to H3 and 39 fewer days of usable water compared to H4.

And we evaluated the BA H3+ scenario which was shown on that earlier DWR slide, and you can see that that one lies between H3 and H4.

The next slide --

(Exhibit displayed on screen.)

WITNESS PAULSEN: -- shows the results for the D-1641 chloride concentration of 250 milligrams per liter, which is evaluated at Contra Costa Canal. And, again, the scenarios are presented in largely the same order.

What we see is that, over the 16-year period, the CWF H3+ scenario has a total of about 113 more days of exceedance than the H3 scenario, has 118 days of exceedance compared to the H4 scenario, has 276 more days of exceedance compared to the Boundary 2 scenario, and has 87 more days of exceedance compared to the BA H3+ scenario.

The other thing I noticed, that the D-1641 objectives for municipal and industrial use chloride

thresholds are also intended to reflect recreational uses within the Delta.

So, these increases in salinity and increased frequency of exceedance of these objectives are expected to impact recreational uses as well.

The next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: This figure is taken directly from DWR-1008, and it lays out some of the various scenarios that have been evaluated here.

And what you see is that the CWF H3+ scenario shown in the largest box on the bottom. And this figure implies that that CWF H3+ scenario, sort of the middle-of-the-road scenario, in the middle of these others, between the other operating scenarios.

And this is also, if you notice the gray boxes near the top of the figure, comparing these different scenarios to the Delta outflow requirements, whether they're comparable to existing Delta outflow requirements or would involve higher Delta outflow requirements.

The figure implies, at least to me, that the CWF H3+ scenario may have similar or slightly higher Delta outflow requirements as we see in existing conditions.

DWR didn't evaluate an existing conditions run, so that's one reason that we've added that, and why we've compared the -- this scenario to the existing conditions.

What you see from the salinity results, though, is that the CWF H3+ impacts really don't lie, at least in Antioch's intake, between H3 and H4 but, rather, closer -- more on the Boundary 1 side of things.

And so --

Next slide, please --

(Exhibit displayed on screen.)

WITNESS PAULSEN: -- the next thing we did was to look at the amount of water exported from the Delta under these various scenarios.

And what we see is that the total exports for Scenario CWF H3+ are greater than the exports for the Boundary 1 and Boundary 2 scenarios -- those are the months that have a single X in the box -- for 28 out of 192 of the months. That's 15 percent of the simulation period.

And we also looked to see if the exports were greater than either the EBC2 existing condition or the No-Action Alternative and found that the CWF H3+ export volumes were greater than both of those two baseline

scenarios in eight of 192 months, which is 4 percent of the simulation period.

And just looking at where the Xs fall on this chart, you can see that these changes are particularly pronounced in the months of June, July and August.

So, we concluded on the basis of this analysis that the operations of Scenario CWF H3+ are not bound by the Boundary 1 and Boundary 2 scenarios.

And for a significant portion of the simulation period, the amount of water exported under the CWF H3+ scenario exceeds the amount of water exported under all the simulated scenarios, including Boundary 1, Boundary 2, H3, H4 and, in some months, the baseline scenarios of the No-Action Alternative and the existing conditions EBC2 run.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: Just briefly, this goes to the potential impacts resulting from adaptive management.

DWR stated in DWR-1010 that adaptive management may result in operations to the Boundary 1 scenario in the future. And as we saw on the prior slides, the Boundary 1 scenario has greater salinity impacts at Antioch's intake than the other scenarios

do.

We also know that adaptive management will consider fish and wildlife in making adaptive management decisions and will not explicitly consider municipal and industrial uses or the water quality needed for those uses. So, the effects of adaptive management are of concern to the City for that reason.

Even though DWR evaluated -- Well, DWR evaluated only CWF H3+ in the Part 2 testimony. They didn't evaluate the other scenarios, even though they said that they may operate to those other scenarios.

For Antioch, the Boundary 1 operations would reduce the number of usable water days by 430 compared to existing conditions EBC2 and by 365 days compared to the CWF H3+.

So, in other words, if adaptive management is used to shift operations to the Boundary 1 conditions, Antioch would use a full year -- lose a full year worth of usable water over the 16-year simulation period.

And, clearly, if the Project is operated to Boundary 1 or similar operations, the water quality impacts will be greater than those that have been disclosed for CWF H3+.

Thank you.

CO-HEARING OFFICEER DODUC: Thank you,

Dr. Paulsen.

All right. Mr. Mizell, Miss Ansley.

(Pause in proceedings.)

CO-HEARING OFFICEER DODUC: And what I'd like to do is take a short break around 10:45-ish so if there's a good time to interrupt your cross-examination questioning, please keep that timing in mind. And it'll be a short break.

MS. ANSLEY: If you'll just give us a moment to set up.

CO-HEARING OFFICEER DODUC: Actually, let's take a really, really short break right now.

We'll return at 10:25.

(Recess taken at 10:18 a.m.)

(Proceedings resumed at 10:31 a.m.:)

CO-HEARING OFFICER DODUC: All right. Thank you. We're back.

I'll note for the record that, in all these months, years of hearings, this is only the second time that I've been late.

So I think I'm allowed a third time. I'll find a right moment.

In any case, thank you for -- for waiting.

We'll now turn to DWR for cross-examination of Dr. Paulsen.

MR. MIZELL: Is it still your hope that we break in 15 --

CO-HEARING OFFICER DODUC: You know what? Let me check with the court reporter.

THE REPORTER: (Shaking head.)

CO-HEARING OFFICER DODUC: No? You good?

THE REPORTER: (Nodding head.)

CO-HEARING OFFICER DODUC: Okay. Since that was a longer break than anticipated, please go ahead and just proceed.

MR. MIZELL: We're going to start with -- with cross on Antioch.

Okay. If we could bring up Antioch-600, please.

(Exhibit displayed on screen.)

MR. MIZELL: I'm looking at Page 3, Opinion 5.

(Exhibit displayed on screen.)

MR. MIZELL: I think it's right around Line 13.

(Exhibit displayed on screen.)

MR. MIZELL: There you go.

CROSS-EXAMINATION BY

MR. MIZELL: Dr. Paulsen, do you compare the California WaterFix H3+ with the No-Action Alternative for the purposes of Opinion 5?

WITNESS PAULSEN: When you go into the detail of Opinion 5, the No-Action Alternative is included in all of the tables. We provided results for all of the different scenarios.

MR. MIZELL: And is your conclusion based upon a comparison of H3+ to the No-Action Alternative?

WITNESS PAULSEN: I think the conclusion is pretty clear here. It spells out which alternatives are being looked at.

But, again, if you want to compare it to the No-Action Alternative, the information's all here.

MR. MIZELL: I understand.

But your conclusion is not based upon that comparison; correct?

WITNESS PAULSEN: The conclusion is just as stated. It's looking at the other WaterFix scenarios primarily.

MR. MIZELL: So that's a no?

WITNESS PAULSEN: No, not in that we did consider the results for the No-Action Alternative in formulating this. They're all here. But, here, we were comparing the different operational scenarios.

So, we certainly considered the No-Action Alternative in formulating these opinions.

MR. MIZELL: And could we go to Page 9,

please, looking at Table 3.

(Exhibit displayed on screen.)

MR. MIZELL: Thank you.

Isn't it true that there are six years in which the California WaterFix H3+ has fewer number of days of modeled exceedance as compared to the No-Action Alternative?

WITNESS PAULSEN: I haven't counted them. Would you like me to count them right now?

MR. MIZELL: Sure.

WITNESS PAULSEN: Okay. And, again, it's when the CWF has fewer?

MR. MIZELL: Yes.

(Pause in proceedings.)

WITNESS PAULSEN: I count five.

MR. MIZELL: And what years would those be?

WITNESS PAULSEN: If I'm looking at this correctly, it would be 1977, 1979, 1980, 1986, and 1990.

MR. MIZELL: Is 1982 fewer days of exceedance than the No-Action Alternative?

WITNESS PAULSEN: Ah. There's the sixth. Yes, it is, by two days.

MR. MIZELL: And in looking at the total number of days out of the 16-year simulation, isn't it

true that California WaterFix H3+ shows 68 fewer days of exceedance than the No-Action Alternative?

WITNESS PAULSEN: If -- If you've done the math correctly, that looks about ballpark right, yes.

MR. MIZELL: If we go up to Page 8, please, looking at Table 1.

(Exhibit displayed on screen.)

MR. MIZELL: And just so I understand this table correctly:

This is the -- This is calculating the total number of days that are usable as defined by the 1968 Antioch agreement with the Department; is that correct?

WITNESS PAULSEN: Where usable water is defined consistent with that agreement, yes.

MR. MIZELL: And does the California WaterFix H3+ show an equal or greater number of days of usable water as compared to the No-Action Alternative?

WITNESS PAULSEN: In all but the wettest 10 percent, that appears to be the case.

MR. MIZELL: And in total, when you look at the total number of days, isn't it true that California WaterFix H3+ has four additional days of usable water under the contract than the No-Action Alternative?

WITNESS PAULSEN: Four?

I'm sorry. You wouldn't see that from

Table 1. You'd calculate that from Table 2.

If you could scroll down, please.

(Scrolling through document.)

WITNESS PAULSEN: And here, it looks like the CWF H3+ scenario has 1903 days, and the No-Action Alternative has 1878 days.

So there would be a difference, I think, of 25 if I --

MR. MIZELL: That's 25, correct.

WITNESS PAULSEN: -- do the math.

MR. MIZELL: For Table 2? Thank you.

If we go to Page 3, Opinion 7, please.

(Exhibit displayed on screen.)

MR. MIZELL: In Opinion 7, your concern is focused on Boundary 1; is that correct.

WITNESS PAULSEN: Well, yes. We evaluated what the change in water quality would be at Antioch's intake for the Boundary 1 scenario and compared that to the CWF H3+ scenario.

MR. MIZELL: And isn't it true that the primary driver of water quality differences between the Boundary 1 and the H3 -- the California WaterFix H3+ scenario is the implementation of Fall X2?

WITNESS PAULSEN: That is one of the differences, yes.

MR. MIZELL: And is Fall X2 a Biological Opinion standard for the protection of fish?

WITNESS PAULSEN: That's my understanding, yes.

MR. MIZELL: If the fis -- fish agencies were to determine there is no need for Fall X2, wouldn't that eq -- apply equally to both the California WaterFix H3+ and the No-Action Alternative scenarios?

WITNESS PAULSEN: Well, we make -- I mean, that decision will be made either with or without the Project.

I don't know enough about biology to know whether the fish would be distributed similarly under those two different conditions. I don't -- I don't know how to answer that question.

MR. MIZELL: Certainly. I'm not asking you to put yourself in the place of fish agencies.

I'm saying, under the hypothetical, if the fish agencies decide Fall X2 is no longer necessary, wouldn't that be true under both the No-Action Alternative and the California WaterFix H3+?

WITNESS PAULSEN: I don't know.

MR. MIZELL: Okay. Did you incorporate into your assessment for Opinion 7 the payment provisions of the contract between DWR and Antioch?

WITNESS PAULSEN: The payment provisions?
MR. MIZELL: Yes.
WITNESS PAULSEN: No. This was an analysis of salinity at Antioch's intake.
MR. MIZELL: Thank you.
If we could go to Page 11, please.
(Exhibit displayed on screen.)
MR. MIZELL: Looking at Lines 8 and 9, the sentence that starts with (reading):
"Results of this analysis are summarized in Table 4."
WITNESS PAULSEN: Yes.
MR. MIZELL: Which DSM-II model input or output data did you use to compute the Delta exports for the No-Action Alternative and the California WaterFix H3+ scenarios?
WITNESS PAULSEN: We were using information from the DSM-II model runs that were provided by DWR at various points in time throughout this -- Well, most of them through this proceeding. The EBC2, although that's . . . No, that was compared here. That was from, I believe, 2013.
MR. MIZELL: EBC2 is from 2013?
WITNESS PAULSEN: I -- I -- I'm not exactly sure of the date. I think it was 2013.

MR. MIZELL: And, otherwise, you used -- With the exception of the EBC2 run, you were using DSM-II model runs that were produced by the Department.

WITNESS PAULSEN: I believe so, yes.

MR. MIZELL: Okay.

(Pause in proceedings.)

MR. MIZELL: Did you perform an analysis on annual exports?

WITNESS PAULSEN: If you look at Antioch-602, those are the bar charts that summarize the amount of water exported in every month in the 16-year period under the various scenarios. That does have an annual average result.

MR. MIZELL: And isn't it true that, for annual Delta exports, CWF H3+ falls between Boundary 1 and Boundary 2 in all the years evaluated except for 1983?

WITNESS PAULSEN: Let me take a look.

I believe that's the case but I want to confirm.

(Examining document.)

WITNESS PAULSEN: I don't think that's the case.

If you look at Antioch-602, the results that are --

(Exhibit displayed on screen.)

WITNESS PAULSEN: -- on Page 3 for Water Year 1983, it looks like there, the annual average exports for CWF H3+ are greater than both Boundary 1 and Boundary 2.

(Examining document further.)

WITNESS PAULSEN: The others do, I think, appear to be between Boundary 1 and Boundary 2.

MR. MIZELL: Okay. So you would agree with the statement that, in all years but 1983, they fall between the Boundary -- CWF H3+ falls between the Boundary 1/Boundary 2 scenarios for exports.

WITNESS PAULSEN: When evaluated as an annual average, yes.

MR. MIZELL: Okay. If we could go to Antioch-601, please.

(Exhibit displayed on screen.)

MR. MIZELL: Slide 10.

(Exhibit displayed on screen.)

MR. MIZELL: When summarizing this slide today, you made the statement that, 15 percent of the time, exports were higher than under the other scenarios.

Is that a -- Is that an accurate recollection of what you were saying this morning?

WITNESS PAULSEN: I believe I said, in 28 of 192 months in the 16-year simulation period, so that would be 15 percent of the months in the 16-year simulation period.

MR. MIZELL: So, in the remaining 85 percent of the months, it would either be lower or the same?

WITNESS PAULSEN: Yes.

MR. MIZELL: Your analysis for this slide does not identify if these exports were ever releases from storage; does it?

WITNESS PAULSEN: No. We didn't look at those operational aspects.

MR. MIZELL: Thank you.

I'm going to now turn it over to Jolie -- Miss Ansley.

CO-HEARING OFFICER DODUC: Miss Ansley, welcome back. We've missed you during the rebuttal phase.

MS. ANSLEY: Thank you. I had to do a quick trip to North Carolina to pick up a kid at a program, so . . .

I missed you all as well.

CO-HEARING OFFICER MARCUS: Really?

(Laughter.)

MS. ANSLEY: Well, rural North Carolina is a

kind of a hard trip.

CROSS-EXAMINATION BY

MS. ANSLEY: So these questions are going to be with regards to Stockton if you'd like to get the Stockton materials in front of you. I don't know if we made that clear.

And after that, Mr. Mizell will do Sac Regional because these two are very interrelated and call on the earlier testimony.

And that's Stockton-61 if that's what's up on the screen.

(Exhibit displayed on screen.)

MS. ANSLEY: Thank you.

We can go to Opinion 1, which begins on Page 2. We can start with Line 20 just to orient everyone to what Opinion 1 is.

(Exhibit displayed on screen.)

MS. ANSLEY: This is your opinion, Dr. Paulsen, regarding water quality impacts. But -- But I take this to be mainly Chloride impacts; is that correct.

WITNESS PAULSEN: Right, as a surrogate for salinity, yeah.

MS. ANSLEY: And looking on Page -- Let's see.

(Pause in proceedings.)

MS. ANSLEY: Looking on Page 2, Line 26, which carries over to Page 3, Line 1, you state that the (reading):

". . . California WaterFix includes higher spring outflow requirements which are met by reducing South Delta exports, and therefore less Sacramento River water is moved through the Delta."

Did I read that correctly?

WITNESS PAULSEN: Yes.

MS. ANSLEY: And, in essence, less pumping is drawing less Sacramento River water across the Delta; correct? Did I sum -- Did I paraphrase that correctly?

WITNESS PAULSEN: Right, under those conditions, yes.

MS. ANSLEY: Isn't it true that the City of Stockton's Water Right Permit is for diversions from the San Joaquin River?

And we can pull that up if you like.

WITNESS PAULSEN: I don't recall.

MS. ANSLEY: Can we look at Stockton-14.

(Exhibit displayed on screen.)

MS. ANSLEY: And can we scroll down.

You don't have to go very far. It's kind of blown out.

(Exhibit displayed on screen.)
MS. ANSLEY: Okay. Stopping right there.
Does this refresh your recollection of the City of Stockton's Water Right Permit. I believe it was issued in -- and Mr. -- Miss Taber can correct me -- in 2012; is that correct?
MS. TABER: (Nodding head.)
MS. ANSLEY: Does this refresh your recollection of the source of Water -- the City's Water Right Permit?
WITNESS PAULSEN: Well, it reads (reading):
"Source of water: San Joaquin River."
But as we've presented in prior testimony, the water that is diverted by the City originates from multiple sources, not just San Joaquin River water, so I want to be very clear about that.
MS. ANSLEY: And on Page 3, the threshold that we are still talking about, which was the threshold I believe you and I talked about in Part 2 case in chief and was also the subject of testimony in Part 1, is the 110 milligrams per liter Chloride operational thresholds of the City of Stockton; is that correct?
WITNESS PAULSEN: Yes.
MS. ANSLEY: And we confirmed in Part 1 that

the one -- and in Part 2, I believe, you and I on cross, that the part -- that the 110 milligrams per liter Chloride level is not an adopted Federal or State water quality objective; is that correct?

WITNESS PAULSEN: I don't remember us talking about that but I think the statement is correct. It is an operational threshold that's used by the City.

MS. ANSLEY: And in this proceeding, both you and Mr. Granberg have testified in Part 1 that the 110-milligram per liter limit is actually a function of the City's ability to discharge wastewater, effluent, to the San Joaquin River; is that correct?

WITNESS PAULSEN: I believe that's a large part of why they use that threshold, yes.

MS. ANSLEY: Is it also your understanding that the City of Stockton's NPDES Permit permits discharges to ground?

WITNESS PAULSEN: I haven't looked at that. I don't know.

MS. ANSLEY: You're not familiar with the NPDES Permit?

WITNESS PAULSEN: I have reviewed it in the past. I don't remember that -- the answers to that question.

MS. ANSLEY: Okay. Do you have any

understanding about the alternate areas that City of Stock -- or the alternative places to which City of Stockton can discharge its wastewater effluent other than San Joaquin River?

WITNESS PAULSEN: I haven't looked into that recently, no.

MS. ANSLEY: Do you recall what the effluent discharge limit is for electrical conductivity?

MS. TABER: I'm going to object to these questions.

Dr. Paulsen's testimony doesn't address the specifics of the -- Stockton's Wastewater discharge requirements, and this goes beyond the scope of her testimony, this line of questioning.

MS. ANSLEY: And I'd respond.

This is my last question and this is indeed the final piece of the -- sort of the testimony where Dr. Paulsen is testifying regarding impacts and injury to the City of Stockton but continuing to apply the 110-milligram-per-liter threshold, which is not a State or Federal objective and that was my last question regarding kind of making sure that we understand this 110 milligrams per liter is coming from.

CO-HEARING OFFICER DODUC: Understood.

Overruled.

WITNESS PAULSEN: I'm sorry. Could you reask the question, please.

MS. ANSLEY: Could we read that question back?

(Record read as follows:)

"Do you have any understanding about the alternate areas that City of Stock -- or the alternative places to which City of Stockton can discharge its wastewater effluent other than San Joaquin River?"

WITNESS PAULSEN: I do not.

MS. ANSLEY: And I think, actually, my last question was whether you're aware of the EC effluent limit in the NPDES Permit issued to the City of Stockton for wastewater discharge.

WITNESS PAULSEN: And, again, I've reviewed that permit in the past. I don't recall the number sitting here today. I did not review that permit prior to today's testimony.

MS. ANSLEY: Looking at Table 1 on Page 3, the top of Page 3 of your testimony.

(Exhibit displayed on screen.)

MS. ANSLEY: And this is just in the nature of a quick confirmation to make sure we're still talking about the exact same analysis that we've been talking about through the various phases of this hearing.

You started with the DSM-II electrical conductivity results for the 16 years of simulation; is that correct?

WITNESS PAULSEN: Yes. And I think you mean the top of Page 4.

MS. ANSLEY: I apologize. Is it Page 4? Thank you for correcting me.

(Exhibit displayed on screen.)

MS. ANSLEY: Yes, that's fine.

And you converted the EC to estimate chloride concentration using EC-chloride conversion --

WITNESS PAULSEN: Yes.

MS. ANSLEY: -- formulas?

And you base those estimates you looked at -- And based on those estimates, you looked at the number of equivalent days per year at Stockton's intake for drinking water that exceeds hourly average chloride thresholds of 110 milligrams per liter?

WITNESS PAULSEN: Yes, I believe you said that right.

MS. ANSLEY: And at the bottom of Page 4, there's the footnote there showing it's where you got the conversions.

And I believe that there's a typo that you can maybe correct but . . .

And these are the -- the same conversion formulas that you used in Stockton-26; is that correct? It was the same methodology?

WITNESS PAULSEN: Yeah.

Well, as indicated in this footnote, we became aware while doing this that we had used -- The Guivetchi 1986 expresses several different ways of relating the conversion factors one to another. And there are a forwards way of relating EC to chloride and a backwards way. And we had been using those expressions slightly differently, so they result in slightly different conversions.

So, Guivetchi calculated the conversion from EC to chloride using a dataset and then, using the same dataset, calculated the conversion from Chloride to EC, and they yield very slightly different results.

And, so, here we're acknowledging that we used two different interpretations of the numbers in Guivetchi 1986 to calculate the Chloride concentrations that are based on the DSM-II model results for EC. And so we're just acknowledging those differences.

MS. ANSLEY: That there are two different equations, but the equation -- And I realize here it says Equation 2 was the one you used but it was actually Equation 1; right? Chloride from EC.

WITNESS PAULSEN: Well, the two equations are shown here.

MS. ANSLEY: Um-hmm. But it says Equation 2 was used to generate this table, but it was actually Equation 1; wasn't it? Equation 1 was the formula also reported in the Stockton-26 as the Chloride conversion formula.

WITNESS PAULSEN: I believe the footnote is correct. I would have to go back into the underlying source data to -- to confirm that.

But we did -- When we wrote this, we looked at those and I believe the footnote is correct.

MS. ANSLEY: That you used the formula where the resultant was EC. EC equals factors including slope, obviously, intercept, that -- I believe you said you started with the DSM E -- electroconductivity levels; is that correct?

WITNESS PAULSEN: Right.

But certainly you could solve Equation 2 for chloride.

MS. ANSLEY: Certainly.

WITNESS PAULSEN: And that's what we did.

MS. ANSLEY: You used Equation 2 here to generate Table 1? That's correct?

WITNESS PAULSEN: I believe that's correct,

yes.

MS. ANSLEY: If I -- If I could have a just a moment, I'd like to pull out Stockton-26 which I have in my pile here.

CO-HEARING OFFICER DODUC: Okay.

MS. ANSLEY: Do you recall offhand which formula you used for Stockton-26 generation of tables? Because my memory is that it's Equation 1.

WITNESS PAULSEN: It very well may be. That's what we're trying to acknowledge here.

Let me find it.

MS. ANSLEY: Apologies. Let me find it.

(Pause in proceedings.)

CO-HEARING OFFICER DODUC: And let us find Stockton-26 as well.

(Exhibit displayed on screen.)

MS. ANSLEY: And when you have Stockton-26, I believe the pages that I was thinking of in my head are Pages 10 and 11 where the EC-to-Chloride conversion is discussed.

(Exhibit displayed on screen.)

WITNESS PAULSEN: Yes, that's correct.

(Pause in proceedings.)

MS. ANSLEY: Okay. And so -- I apologize, Dr. Paulsen.

That is where you were thinking as well?

Could you scroll down a little further, please.

(Scrolling through document.)

MS. ANSLEY: And then keep scrolling to the top of the next page.

(Scrolling through document.)

MS. ANSLEY: And, there, we see the formula that we believe was used for all of the data in Stockton-26's conversion of DSM-II EC to chloride by you; is that correct?

WITNESS PAULSEN: Yes, I believe that's correct.

But, again, in preparing the current testimony, we became aware that we had used two different equations, one where it was the -- let me make sure I say this right -- the EC equals slope times Chloride plus intercept, where we had solved that for chloride and used that conversion to calculate the Chloride concentrations from EC rather than using the equation that's expressed as chloride equals slope times EC times -- plus intercept.

MS. ANSLEY: Okay. And I'm going to a little bit pedantic but I'm going to try and dispense with this in just a couple questions.

For Stockton-26, is this the correct formula that you see here on the screen that was used to generate the data that you relied on in Part 1 for Chloride?

WITNESS PAULSEN: Sitting here today -- I worked through this in the Part 2 testimony. I would have to work through it again to answer that question precisely.

The differences between the two -- The two equations are based on the same dataset --

MS. ANSLEY: Right.

WITNESS PAULSEN: -- and the differences are relative small. So I --

MS. ANSLEY: Okay. I'm sorry.

WITNESS PAULSEN: I'm sorry.

MS. ANSLEY: So, sitting here today, you can't -- you can't -- you can't commit to telling me that that is the formula that was used for the dataset in Part 1.

WITNESS PAULSEN: I believe it is.

MS. ANSLEY: Yeah.

WITNESS PAULSEN: But, again, I'd want to go back and confirm.

MS. ANSLEY: And then when we spoke in Part 2, I believe you had come back and done further analysis.

Is that Stockton-48? Did you do further analysis on . . . Chloride?

WITNESS PAULSEN: I need to find Stockton-48.

MS. ANSLEY: I'm sorry. Me as well.

(Exhibit displayed on screen.)

MS. ANSLEY: And I'm just trying to make sure that I understand. I'm not trying to, like, pull any -- I'm trying to understand where your analysis is and -- so I can understand which formulas were just applied in each of the pieces since they all sort of sum up to Stockton-61 here, in a way.

WITNESS PAULSEN: What the -- The point that I would make with respect to Stockton-61 is that, to the extent that there were any discrepancies, they are fixed in Stockton-61, and all of the data that are shown in that table in Stockton-61 were computed using the same conversion formula.

MS. ANSLEY: Okay. So --

WITNESS PAULSEN: And, so, relative to each other, the analyses that are shown in that table are consistent.

MS. ANSLEY: And the analyses -- So, for each of the modeling scenarios shown in Table 1, the data was wholly rerun again using Formula 2. But it wasn't pulled from, like, the -- it wasn't pulled from

Stockton-26 or, if applicable, Stockton-48, and then you just completed CWF H3+, which would be the rightmost column of this, using equa -- There is not a mixture of equations in this table is what you're telling me.

WITNESS PAULSEN: I don't believe so. I believe that we fixed any discrepancies in the preparation of this table.

MS. ANSLEY: And is there a reason -- I'm just asking:

Is there a reason why you chose to use Equation 2 for this table as opposed to Equation 1? Understanding what you're saying that they're pulling from the same dataset.

But is there a reason why you put in a different equation, then, into your spreadsheets?

WITNESS PAULSEN: Honestly, we didn't realize that the two equations would give slightly different results until we got to this stage, because they're all generated using the same Chloride EC-TDS dataset is my understanding.

And when we did figure that out, we were surprised and so put everything on a common basis.

MS. ANSLEY: Is there anywhere you can point to in this testimony that would have alerted me to the

fact that this was -- Indeed, I assumed this was a bit of a typo because I read all the prior testimony and the equations that were used.

Is there anywhere you -- where you report that there were differences between the two occasion -- equations or that, indeed, two different equations were used in your analysis?

WITNESS PAULSEN: Here in this footnote.

MS. ANSLEY: Here in this footnote, you say that Equation 2 was used to generate Table 1.

WITNESS PAULSEN: Yes.

MS. ANSLEY: But it doesn't make any reference to Stockton-26 or any other analysis that you did.

WITNESS PAULSEN: Stockton-26 is referenced in the header to that table.

(Exhibit displayed on screen.)

MS. ANSLEY: Yes. But can you see where it says "update to Stockton-26"? It was just sort of generally implied that you were adding CWF H3+ and not employing different formulas.

WITNESS PAULSEN: The footnote was intended to clarify that the update to Stockton-26 Table 4 was to make sure the salinity or the -- sorry -- the EC-to-Chloride conversions were consistent with all of the data points that are in this table.

Apologies if it was a clunky way of doing it, but it was our attempt to be as clear as we could.

MS. ANSLEY: Okay. Two questions and I believe I can then move on.

And just to make sure I heard the answer clearly:

When you created Table 1, all of the numbers in Table 1 were used -- were generated with Equation 2. All of them. All of the modeling scenarios. Just to make sure I heard that answer correctly.

WITNESS PAULSEN: I believe so, yes.

MS. ANSLEY: Okay. Would it be possible to -- Did you do an analysis comparing the differences between the two equations?

WITNESS PAULSEN: We did. We created a couple of graphs that showed the different lines and slopes to understand how significant the difference was and, on the basis of that, concluded that it really wasn't very significant in terms of calculating these numbers.

MS. ANSLEY: Would it be possible to obtain that analysis and the spreadsheets that went into the creation of Table 1?

WITNESS PAULSEN: We have that information. I don't have it here with me.

MS. ANSLEY: Sure. Your -- Your attorney

can -- can forward it to me.

I would ask, though, that it's actually forwarded to Mr. Mizell because our private law firm does have problems with certain programs like Dropbox.

MS. TABER: Well, I'm going to object to that request because Dr. Paulsen didn't rely on that comparison to present the information that's shown in Table 1.

She's indicated that she completely reran Table 1 and she doesn't draw an opinion regarding the differences in the use of Equation 1 versus Equation 2 in her testimony.

CO-HEARING OFFICER DODUC: But she also, if I remember correctly, didn't address Miss Ansley's question as to whether there was a reason why she picked Equation 2 to demonstrate that in Table 1.

Why did you go with Equation 2 in Table 1?

WITNESS PAULSEN: In short, because we didn't realize there was a difference between the two equations until we got to this stage, because --

CO-HEARING OFFICER DODUC: So let me understand, then.

So you applied Equation 2 before you determined that there was a difference.

WITNESS PAULSEN: When we were generating this

table and adding CWF H3+ to the prior results, we became aware that the two different conversions yielded slightly different results in terms of the Chloride concentration that you compute from the EC that's generated by DSM-II.

CO-HEARING OFFICER DODUC: And when you became aware of that, why did you choose -- is there a reason that you chose to go with Equation 2?

WITNESS PAULSEN: No. And the difference between the two is very slight. They do yield slightly different results.

Here, we wanted everything to have a uniform basis. And, honestly, it probably doesn't matter whether you choose Equation 1 or Equation 2 because the difference -- I mean, the calculated results are nearly the same.

But we did feel that it was important to acknowledge that difference and to make sure that the results that we were presenting were on a common basis exactly to avoid this kind of questioning.

CO-HEARING OFFICER DODUC: Didn't work.

Miss Ansley, what is the basis for your request?

MS. ANSLEY: Well, my request is that if we are permitted to do surrebuttal now, we have tables

from both Stockton-26, and we have this table which I'm assuming she reran -- from her answer that she reran all the modeling scenarios, but that have different equations being used.

And I would like the opportunity to see -- to make sure:

One, that the -- that mathematically it's correct. That's usually why we ask for the spreadsheets, to make -- to see the actual methodology used by an expert.

But, two, I would like to see as well that there is not a significant difference between the two equations.

And work product by experts in a proceeding, whether it's an administrative proceeding or a court, are usually discoverable. And so if it needs to be formal, I'm happy to have a formal request drafted but typically in this proceeding, you know, experts are not reluctant to hand over their spreadsheets, nor if they had a change in the analysis which is not apparent in their testimony, the graphs that might show that there's not a significant difference in the two equations generated by Guivetchi in his article, which is also -- His article is in the record as well. I just would like to see . . . that analysis.

CO-HEARING OFFICER DODUC: All right.

MS. TABER: And my response is that if the Department would like to understand the differences, they're welcome to make that calculation in surrebuttal, but it's not Stockton's obligation to create -- or provide an analysis that didn't form the basis for the opinion that Dr. Paulsen has offered here in Part 2 rebuttal.

MS. ANSLEY: And I'd also like to add that I thought it was part of the Hearing Officers' -- I thought it was part of the Notice of Hearing -- rules regarding conduct of the proceeding, and perhaps even in the rules and regs, that analysis by experts are usually supposed to be provided with their testimony so they can be analyzed. This is --

CO-HEARING OFFICER DODUC: Enough.

MS. ANSLEY: -- a summary table.

CO-HEARING OFFICER DODUC: Enough.

Miss Des Jardins.

MS. DES JARDINS: I would like to point out that there is a precedential hearing ruling.

Miss Suard asked for the analysis of Petitioners' witnesses of -- when comparing Steamboat Slough salinities under -- They gave oral testimony that they were roughly equivalent.

She asked for them to produce the analysis and the Hearing Officers ruled that they didn't have to.

It was a compare -- They gave oral testimony that they had looked at the results of CWF H3+ and compared it with what was analyzed in Part 1.

But the basis of that was not required to be produced.

CO-HEARING OFFICER DODUC: Okay. In any case, we have not determined that there will be surrebuttal.

At the time that we make that decision, should surrebuttal be required, we will ask Dr. Paulsen to provide that information.

MS. ANSLEY: Okay. Thank you.

Let me try and get back into the flow of my questions.

In looking at Footnote 1 there -- and this is moving on -- the location listed RSAN035.

I believe in the parlance that we've been speaking so far in the proceeding, that that's Site 16 in the Guivetchi article; is that correct?

WITNESS PAULSEN: We'd have to pull up Guivetchi. I don't remember.

MS. ANSLEY: Can we pull up Antioch-205, please.

(Exhibit displayed on screen.)

MS. ANSLEY: And I think it's Page 6, thereabouts, so not far in.

(Exhibit displayed on screen.)

MS. ANSLEY: Oh, yes. Can you scroll down . . . to this map.

(Scrolling through document.)

MS. ANSLEY: Does this refresh your recollection that the site that we're -- that you are using as your EC-Chloride conversion location, where the formulas were derived, is for Site 16?

WITNESS PAULSEN: I believe that's the case. We should look at the data tables to confirm that.

MS. ANSLEY: I believe that's the next page.

(Scrolling through document.)

MS. ANSLEY: Oh, I'm sorry. It's not. If you'd give me a moment.

WITNESS PAULSEN: The tables that have the conversion equations sort of list both . . . side-by-side.

MS. ANSLEY: Yeah. They're -- They're -- They're right around here somewhere.

I apologize. I wasn't expecting --

(Scrolling through document.)

MS. ANSLEY: There we . . .

(Pause in proceedings.)

MS. ANSLEY: There we go. Go slower.

So this is hard to read but keep scrolling down, please.

(Scrolling through document.)

MS. ANSLEY: Actually, it's all right.

Can we go back to the map on Page 6. I think I can skip over these questions because they were subject of cross-examination previously, if you don't recall, Dr. Paulsen.

Do you recall testimony in Part 1 regarding the choice of locations to do EC-Chloride?

WITNESS PAULSEN: I do.

MS. ANSLEY: You do recall that.

WITNESS PAULSEN: Generally, yes.

MS. ANSLEY: General things.

So you're -- Not committing you to Number 16, because I realize you said you did not recall, but in . . .

Is it your understanding that none of these blue sites are exactly the Stockton intake?

WITNESS PAULSEN: That's correct.

MS. ANSLEY: And you chose the site that you felt was the most representative?

WITNESS PAULSEN: Yes.

MS. ANSLEY: Is it -- Do you have any

understanding of how far the site that you chose is from the Stockton drinking water intake.

WITNESS PAULSEN: Is there a scale on this map?

MS. ANSLEY: And I'm not committing you to 16.

Is it now refreshing your recollection that it's 16?

WITNESS PAULSEN: I believe it is.

MS. ANSLEY: Okay.

WITNESS PAULSEN: The drinking water intake is basically on the southwest edge of Empire Tract.

The thing that I -- I can point to it to this map, but I don't have a scale here to know how many feet or miles or whatever it is away.

MS. ANSLEY: But you don't know generally off the top of your head how far away it is.

WITNESS PAULSEN: If there were a scale on the map, we could estimate it with some better accuracy than my guessing.

I would guess a few miles, a couple of miles. I'm not sure exactly.

MS. ANSLEY: Does 5 miles sound around the correct order of magnitude?

WITNESS PAULSEN: It may be. Again, there's not a scale on this map.

MS. ANSLEY: And you did not -- Did you not perform a -- sort of a bookend analysis using the -- a range generated by the EC-Chloride conversions at more than one site, say Site 16 and Site 17? You did not consider doing that?

MS. TABER: Objection: I don't understand the question.

MS. ANSLEY: Dr. Paulsen, do you need me to rephrase the question?

WITNESS PAULSEN: Well, let me see if I can do that with an answer.

I think you asked whether we used a conversion derived from Site 16 and a conversion derived from Site 17 in order to estimate salinity at the Stockton intake.

Is that --

MS. ANSLEY: Well, whether you looked at a sort of a bookend analysis -- Since the Stockton -- since none of these sites for which an EC-chloride conversion was derived, did you consider using a range of Chloride results in a bookend analysis using Site 16 and Site 17?

WITNESS PAULSEN: We considered using several sites. We concluded that Site 17 and Site 26, which on the map are still fairly close to Stockton's intake

location, were not appropriate because the composition of water at those stations is different than it is at Antioch's intake.

Those stations have a higher proportion of San Joaquin River water, specifically.

MS. ANSLEY: Hypothetically speaking, if -- if under the CWF scenarios there's a shift in source of water at the Stockton intake compared to the No-Action Alternative, or perhaps even compared to the existing conditions alternatives, couldn't the use of the EC-Chloride based on historical observations at -- at Site 16 have had different effects?

WITNESS PAULSEN: Well, it would be slight.

As we discussed in Part 1, we did explicitly look at the source of water and how that changed over time as a result of the different model scenarios. And, you know, we considered that in evaluating this.

We did use one EC-Chloride to con -- EC-to-Chloride conversion to interpret the model results produced by DSM-II at that location.

So you're correct that the composition of water will change over time, and that we used one conversion to compare those.

However, in our judgment, that was an appropriate way to estimate the effects of WaterFix at

this location.

MS. ANSLEY: Did you do any further analysis to show that the use of EC-Chloride based on historical measurements is still appropriate?

WITNESS PAULSEN: I don't know how to answer that except that . . .

The EC that is computed in DSM-II takes into account by definition the EC of the various sources of inflow. And so the EC values that are given by the model are essentially independent of that conversion.

And the conversion is then used in order to convert the EC results into a Chloride concentration that can be compared to the City's threshold.

I don't know how else to explain that except to say that I think that DWR also made a similar or perhaps even simpler conversion in its analysis of the model results.

MS. ANSLEY: I'm merely asking.

Is the Guivetchi equations, they're based on historical measurements; is that correct?

WITNESS PAULSEN: Yes.

MS. ANSLEY: And I just wanted to know if you had made any further analysis to verify that those historical measurements and that indeed the EC-Chloride conversions were accurate for Site 16 or the Stockton

drinking water intake.

And --

WITNESS PAULSEN: We --

MS. ANSLEY: -- if you didn't do the analysis, it's a yes-or-no question.

WITNESS PAULSEN: I don't think it is a yes-or-no question.

We did do extensive evaluations of the fingerprints of water at various locations in the Delta and looking at how those would change under the different scenarios.

Based on that analysis . . .

Well, first of all, it didn't seem appropriate for us to make changes to those results because those results were derived for data calculated over a range of conditions and over a relatively long time period where the mix of water at the various locations within the Delta would be changing.

So it's not a perfect linear relationship. Those are lines that are drawn through, essentially, a scatter plot or datapoints that are generated from measured data at the various locations.

And the reason that it varies with location in the Delta is because of the composition of water interior to the Delta changes. That's why you need

different conversions for different locations within the Delta.

MS. ANSLEY: I guess I could ask it in a simpler way.

I understand that you feel that it wasn't necessary or appropriate, but you did not do any further work to verify the EC-Chloride conversion that Guivetchi in 1986 published.

WITNESS PAULSEN: We did not do any further work to judge whether or not the Guivetchi equations continued to be appropriate for measurements that have been made more recently. We did not do that.

MS. ANSLEY: Okay.

And then I'd like to move to your Opinion 2, which is starting on Page 4, Line 18.

(Exhibit displayed on screen.)

MS. ANSLEY: Oh. Thank you. You're faster than I am.

And, then, looking at -- Actually, scrolling down to Page 5, Line 6 through 9, you assert that the DWR used maximum channel velocity as a surrogate for residence time.

Do you see that?

WITNESS PAULSEN: Yes.

MS. ANSLEY: Isn't it true that the DWR used

maximum channel velocity to further characterize the degree of within-channel mixing?

WITNESS PAULSEN: If we go back to, just to -- Some of the testimony that we presented in -- I believe in Part 1 looked at DWR's use of velocities in those channels. And, specifically, we produced some of DWR's figures.

MS. ANSLEY: Well, I'm happy to rephrase.

Isn't it true that it dictates within -- within-channel mixing but not Delta-wide residence time. It's not a surrogate for residence time which we also calculated; is that correct?

MS. TABER: Objection:

Could you rephrase that and define "it." I lost track of the question.

MS. ANSLEY: Maximum velocity was used to characterize within-channel mixing but not Delta-wide residence -- it wasn't a surrogate for Delta-wide residency time; is that correct?

WITNESS PAULSEN: We could go back to the original DWR exhibit, which is -- Shoot. I believe it's DWR-652.

Just a moment.

(Pause in proceedings.)

WITNESS PAULSEN: In DWR-652, DWR presented --

(Exhibit displayed on screen.)

WITNESS PAULSEN: -- both a probability of exceedance of daily maximum velocity, and probability of exceedance of absolute values of daily velocities on a 15-minute time step, for a few different locations within the Delta.

MS. ANSLEY: And this is in -- This is not -- You do not -- You're looking at DWR-652, which is the water quality impacts as opposed to DWR-653, which is Microcystis formation in the Delta.

WITNESS PAULSEN: I have excerpts from DWR-653 as well.

(Exhibit displayed on screen.)

MS. ANSLEY: And it -- And I'm -- I'm happy also to move on if that question is just too ambiguous. If you're -- If you don't agree, that's fine.

WITNESS PAULSEN: Just give me a moment. It's been awhile since I've reviewed these.

MS. ANSLEY: Well, if we could look at DWR-653, Page 13.

WITNESS PAULSEN: Exactly.

(Exhibit displayed on screen.)

WITNESS PAULSEN: At the top of that -- Oh.

Is this DWR-653 at Page 13?

MS. ANSLEY: I believe it's --

WITNESS PAULSEN: It doesn't look right.
MS. ANSLEY: This is .pdf 13. I think we need Page 13.
(Exhibit displayed on screen.)
MS. ANSLEY: And can you zoom out a little so we can see some of the page?
(Exhibit displayed on screen.)
WITNESS PAULSEN: This is the page.
MS. ANSLEY: And the section that I was thinking of -- hopefully, I can identify it quickly -- says "channel" -- It's at the very top.
(Reading):
"Channel velocity also dictates residence time within a channel reach" --
Because we're talking within specific channel reaches; is that correct?
WITNESS PAULSEN: Yes. It reads (reading):
"Channel velocity also dictates residence time within a channel reach because velocities dictate the flushing rate for the reach."
MS. ANSLEY: Right.
WITNESS PAULSEN: And then two paragraphs down, it talks about how (reading):
". . . The CWF would affect daily maximum

velocity and 15-minute absolute velocity (regardless of direction) . . ."

And looks at -- uses those two parameters and graphs of the same to infer information about flushing rates.

And it's my opinion that it is not appropriate to evaluate flushing rates, which are related to residence time, using this type of velocity information.

MS. ANSLEY: And your residence time calculations were Delta-wide; is that correct?

WITNESS PAULSEN: Yes. As explained in the testimony. I believe we first did those in Part 1 if I remember night.

MS. ANSLEY: Yes. Section 4.5 of Stockton-26?

WITNESS PAULSEN: That could be.

What we did was, we look a -- an average volume of the Delta and divided by -- that by the total inflows to the Delta in order to estimate the residence time for the Delta as a whole.

MS. ANSLEY: And this residence time methodology that you employed in Stockton-26 is the same residence time methodology that you're employing here in Stockton-61.

I want to just confirm that we're on the same

methodology.

WITNESS PAULSEN: Yes.

MS. ANSLEY: Okay. And you didn't use any other approaches or methodology to calculate residence time.

WITNESS PAULSEN: No, although I reviewed in detail DWR's calculations of residence time in the FEIR and --

MS. ANSLEY: I understand that, but --

WITNESS PAULSEN: -- and --

MS. ANSLEY: -- my question was, you didn't do any further analysis or approaches to calculate residence time.

WITNESS PAULSEN: The further analysis that we did was to review DWR's calculations of residence time and confirm that our approach yielded substantially similar results.

MS. ANSLEY: On Slide 2 of your slide show, Stockton-66 --

And if you're -- We can -- I'm happy to bring it up if you remember it.

(Exhibit displayed on screen.)

MS. ANSLEY: You said that (reading):

"The residence time of water in the Delta is expected to increase

significantly . . ."

Do you recall that bullet point?

WITNESS PAULSEN: (Reading):

". . . Relative to the (sic) existing conditions and the No-Action Alternative."

MS. ANSLEY: Was there any sort of statistical analysis you did to support the use of the word "significant" or is that just your opinion of the word "significant"?

And I'd ask whether we should be looking for a statistical analysis that I didn't see.

WITNESS PAULSEN: If you look at Stockton-62, those are the tabulated results of residence time. And they show the changes in residence time for the different scenarios in the different year-types, et cetera.

(Exhibit displayed on screen.)

WITNESS PAULSEN: We did not do an additional statistical analysis, but you can see clearly that the residence time increases relative to the baseline conditions.

MS. ANSLEY: I'd like to move on to your Opinion 3, which is on temperature.

I believe on Page 6 . . . Hmm.

Page 6, Line 14 to 15 --
(Exhibit displayed on screen.)
MS. ANSLEY: -- you said it was impossible (reading):
". . . To determine how . . . DWR . . . adjusted air temperatures and other meteorological parameters . . ."
Do you see that testimony?
WITNESS PAULSEN: It doesn't say "impossible." It says (reading):
". . . It does not appear to be possible."
MS. ANSLEY: Okay. I'm sorry. I didn't mean to mis --
WITNESS PAULSEN: Right.
We don't have model results for an existing condition for temperature.
And this goes to the point of wondering how DWR's -- what the difference would be between the parameters of the temperature model for an existing condition and the parameters used in the temperature model for future conditions, such as the No-Action Alternative or, in this case, the BA H3+.
MS. ANSLEY: Are you familiar with the testimony of Dr. Marianne Guerin in this proceeding --

WITNESS PAULSEN: I have --
MS. ANSLEY: -- on temperature modeling?
WITNESS PAULSEN: I have reviewed generally some of the analyses. I don't remember the specifics of that one.
MS. ANSLEY: Did you review DWR-1039?
And we can call up the cover page, if you like, of that one.
WITNESS PAULSEN: Remind me which one that is.
MS. ANSLEY: Yeah. That's why I asked for the hard page because --
WITNESS PAULSEN: Thank you.
MS. ANSLEY: -- so I don't trick you into a number.
(Exhibit displayed on screen.)
MS. ANSLEY: Do you recall reviewing this testimony that she provided regarding water temperature calculations performed?
WITNESS PAULSEN: I did a general review of it.
MS. ANSLEY: You do not recall her testimony on meteorological and water temperature boundary conditions?
WITNESS PAULSEN: I didn't watch her testimony when she gave that. I don't remember the specifics

from this document.

MS. ANSLEY: And I believe that we discussed this in Part 2, you and I, with regards to Sac Regional, but because this is a different party and updated testimony, I have to ask again:

You yourself did not perform any analytical temperature modeling of the impacts of the California WaterFix and, in specific, CWF H3+?

WITNESS PAULSEN: That's correct.

Our analysis of temperature focused on the summary results that were provided by DWR. We did review some calibration information for temperature models.

We also reviewed some literature about the factors that affect temperature in various systems, including in the Delta.

And we reviewed information on the observed temperature fluctuations of water in the Delta and the time-scales of those fluctuations.

MS. ANSLEY: And I'm down to my last three questions now.

Would you agree -- And I believe we've discussed this before.

Would you agree that there are many environmental factors that affect Microcystis bloom

formation?

WITNESS PAULSEN: I would.

MS. ANSLEY: And besides residence time and temperature, did you analyze or study any other factors that affect Microcystis bloom formation?

WITNESS PAULSEN: We certainly reviewed literature and information on other factors.

Those two seem to be the most strongly correlated or the most determinative of Microcystis blooms, and so we focused on those.

MS. ANSLEY: Are you familiar with research demonstrating that one factor that was responsible for Microcystis bloom formation in the Delta, particularly in 2014, is the availability of ammonium as a nitrogen source?

WITNESS PAULSEN: I'm generally familiar with that.

MS. ANSLEY: Is it your understanding that Stockton's Wastewater Treatment Plant is a source of ammonia in the Delta?

WITNESS PAULSEN: I'm sure it is somewhat of a source. However, I've reviewed extensive information showing that, when Stockton upgraded their treatment process -- and, I'm sorry, I don't remember the year -- but that the nutrient concentrations that they

discharged in the Delta fell precipitously.

MS. ANSLEY: So final question.

Is it your understanding that the current NPDES discharge permit allows a certain level of ammonia to be discharged in the effluent?

MS. TABER: Objection: Dr. Paulsen's testimony doesn't go into the details of Stockton's NPDES permit or ammonium or other factors, other than temperature and residence time for HABs formation. This goes beyond the scope of her testimony.

CO-HEARING OFFICER DODUC: Miss Ansley.

MS. ANSLEY: Dr. Paulsen provides a generalized conclusion that Microcystis formation will increase in the Delta, and I'm assuming what she's saying is increase in the vicinity of the Stockton intakes, whether for discharge or drinking water uptake, I guess.

And so my question merely is: She has said that she did not look at any other factors analytically other than temperature and residence time, but that she is generally aware and has reviewed the literature on other factors that drive Microcystis bloom formation in the Delta.

And so my final questions were:

One of -- One of the focuses of that

literature has been available nitrogen sources.

And my final question is, is she aware that Stockton continues to have ammonia in its effluent discharge, which is a driver of Microcystis blooms.

And that's the final question.

CO-HEARING OFFICER DODUC: Over --

MS. TABER: If she has --

CO-HEARING OFFICER DODUC: Overruled, Miss Taber.

WITNESS PAULSEN: Okay. We did review the various causes, and one of the papers that we relied upon most is Berg and Sutula 2015 --

MS. ANSLEY: I'm sorry, but my question -- My final question --

WITNESS PAULSEN: I'm trying to answer your question.

CO-HEARING OFFICER DODUC: Hold on. One at a time.

WITNESS PAULSEN: Sorry.

CO-HEARING OFFICER DODUC: The question, Miss Ansley, again is?

MS. ANSLEY: The question is: Are you aware that the NPDES Permit for the City of Stockton permits the -- a certain amount of ammonia to be discharged in the effluent?

WITNESS PAULSEN: And my answer to that is, that I have not reviewed the details of the NPDES Permit but I would not be surprised if level is allowed to be discharged.

However, we did review the literature and found that the greatest correlations and the ones that we could evaluate were related to water temperature and residence time, and that there is not a scientific consensus of whether ammonium is a driver for Microcystis blooms, and, therefore, we did not focus on that factor.

MS. ANSLEY: And -- And I would move to strike that. That's nonresponsive to my actual question.

CO-HEARING OFFICER DODUC: But it is helpful.

Denied, Miss Ansley.

MS. ANSLEY: And, then, I believe now we're going to turn over to Sac Regional and hopefully we won't -- we'll be able to coordinate.

MR. MIZELL: And I expect we'll be able to do this in the remaining eight minutes.

MS. ANSLEY: Sorry.

CROSS-EXAMINATION RESUMED BY

MR. MIZELL: So if we could bring up SRCSD-40, please, looking at Page 1.

(Exhibit displayed on screen.)

MR. MIZELL: And if we could zoom out, please.
(Exhibit displayed on screen.)
MR. MIZELL: And could we scroll down, please.
(Scrolling through document.)
MR. MIZELL: Thank you.
So, looking at the second paragraph, does the analysis presented in SRCSD-40 use identical assumptions to those described in SRCSD-31?
WITNESS PAULSEN: Yes. It uses the same methodology and the same code.
What is new is running the CWF H3+ model results or using the CWF H3+ modeling results within that code to generate the results.
MR. MIZELL: So, going to Page 2, looking at Table 1.
(Exhibit displayed on screen.)
MR. MIZELL: Looking at the third row that's labeled, "Percent of time diversion required" by percent.
WITNESS PAULSEN: Yes.
MR. MIZELL: Is it true that the California WaterFix H3+ as compared to the No-Action Alternative shows only a 0.7 percent increase?
WITNESS PAULSEN: No. It is true that there is an increase in 0.7 percent of the time in the

simulation period.

But if you were to compare those two numbers to each other, the increase is greater as a percent of the original number.

MR. MIZELL: Yes. But we're only looking at percentage of time in this row; is that correct?

WITNESS PAULSEN: That wasn't the question that you asked me. I mean, it was based on these numbers.

MR. MIZELL: Looking at this row, is the difference 0.7 percent?

WITNESS PAULSEN: If you subtract the two of them, yes. If you look at the percent increase, no.

MR. MIZELL: And that would be a different row; correct?

WITNESS PAULSEN: Well, no. You can calculate a percent increase using . . . these numbers. And, specifically, we did that. I believe that -- Just a moment.

(Pause in proceedings.)

WITNESS PAULSEN: So, if you were -- I did this computation.

MR. MIZELL: But it's not in that row; is it?

So --

WITNESS PAULSEN: I did the computation using

the numbers in the row, yes.

MR. MIZELL: But it's not responsive to the question because I'm focusing on percent of time.

And that percent of time, I believe you've already answered, is correctly calculated as a 0.7 percent increase; is that true?

WITNESS PAULSEN: Let me be as clear as I can.

8.0 percent of the time for the No-Action Alternative, a diversion would be required.

For CWF H3+, a diversion would be required 8.7 percent of the time.

So there is an increase -- The difference between those two numbers is 0.7 percent of the time.

MR. MIZELL: Um-hmm.

WITNESS PAULSEN: But the increase is actually 9 percent -- from the 8 -- to go from 8 percent to 8.7 percent, that is an increase of 9 percent.

MR. MIZELL: I'd move to strike that last portion as nonresponsive.

CO-HEARING OFFICER DODUC: Overruled, Mr. Mizell.

It's a clarification in the record that any of us who can do math and understand percentage will get.

CO-HEARING OFFICER MARCUS: Everyone.

MR. MIZELL: All right. Looking at Table 2,

Page 3.

(Exhibit displayed on screen.)

MR. MIZELL: So looking at the second half of that table, the "average percent of time diversion required."

The average -- The above-normal and below-normal years comparison between the No-Action Alternative and the California WaterFix H3+ is one four -- 1.4 percent of the time; is that correct?

WITNESS PAULSEN: I would answer this in the same way.

The difference between the two is 1.4 percent. But if you're looking at the percentage increase between the two of them, that will be a different number. I didn't do that one before I got here but we could if you'll allow me to pull out my calculator.

MR. MIZELL: I'm just going to move on.

WITNESS PAULSEN: Okay.

MR. MIZELL: Did you analyze the salinity changes in the Sacramento River upstream of the Cache Slough complex as it relates to CWF H3+?

WITNESS PAULSEN: The salinity of the Sacramento River in the up -- upstream of all of this? No, I did not.

MR. MIZELL: How about the salinity in the

immediate vicinity of the Sa -- of the Regional Sanitation District's outflow -- outfall?

WITNESS PAULSEN: No. That is simulated within DSM-II and, therefore, to the -- The salinity evaluations that we did utilized the DSM-II model output, and that considers -- the modeling considers the salinity of the different sources.

We did not explicitly look at salinity at the location you just described.

MR. MIZELL: Is Regional Sanitation District's NPDES Permit subject to salinity changes at Antioch, Stockton, or Contra Costa Canal?

WITNESS PAULSEN: Subject to?

MR. MIZELL: That's correct.

MS. TABER: Objection: It's vague; the witness is unable to answer.

WITNESS PAULSEN: Well, what I would say is that the way in which the effluent limits of a permit are derived during consideration of a lot of factors, one is receiving water quality.

So, I don't know. I -- I doubt that the current NPDES Permit limits were calculated in consideration of those things.

But to the extent that salinity changes in the future and the salinity of the receiving water changes

in the future, salinity could be used in the derivation feature of effluent limits.

(Pause in proceedings.)

MR. MIZELL: And then just to -- This goes to, I believe, a part of your oral summary, so that I'm clear.

With regard to your Opinion 2, Opinion 2 is a restatement of the opinions you've offered on behalf of the Cities of Stockton and Antioch; is that correct?

WITNESS PAULSEN: Just a moment.

(Examining document.)

I think I worded it a little bit differently.

Opinion 2 relies upon the information from the Antioch and the Stockton exhibits, but we tried to tie back -- tie that back into what it means for Regional San.

(Pause in proceedings.)

WITNESS PAULSEN: In other words, the analyses that are in the Stockton and the Antioch testimony show that the salinity in the receiving water will change as a result of WaterFix, and that -- make sure I'm giving you the right opinion, Opinion 2 -- and that the residence times and temperatures and the likelihood of Microcystis will also change as a result of the WaterFix Project, and then to relate that back to what

that means to Regional San.

MR. MIZELL: Okay. I think I understand.

So, if I get this correctly, the underlying analysis is the same as for Antioch and Stockton but you've now taken that analysis and applied it to Regional San.

WITNESS PAULSEN: Well, the underlying analysis is based on DWR's modeling, so that's really the common basis of all of these conclusions.

But then that has implications for Regional San that relate out Regional San's Part 2 case-in-chief testimony.

And, so, our role here was to look and see if this new CWF H3+ scenario has similar impacts and, therefore, if the potential impacts to Regional San's Permits and operations are likely to be the same as they were for the other scenarios that were evaluated.

And, so, our conclusion is on that basis, that, yes, the same vulnerability is there.

MR. MIZELL: Okay. Thank you for that clarity.

That concludes our cross-examination.

CO-HEARING OFFICER DODUC: Thank you, Mr. Mizell, Miss Ansley.

Miss Meserve, you are up next and then

followed by Mr. Ruiz.

Mr. Ruiz, are we still expecting 20 to 30 minutes from you?

MR. RUIZ: Probably a little bit less. But if she goes -- If Miss Meserve goes till lunch, I can review over lunch and confer and might be able to shorten it.

CO-HEARING OFFICER DODUC: Actually, what I'm trying to determine is whether we take a lunch or not.

MR. RUIZ: I see.

Probably -- probably less, probably more like 15 minutes depending on --

CO-HEARING OFFICER DODUC: Okay.

MR. RUIZ: -- what Miss Meserve does.

CO-HEARING OFFICER DODUC: And Miss Des Jardins?

MS. DES JARDINS: I would like to request half an hour, please.

CO-HEARING OFFICER DODUC: Yes, we have that.

MS. DES JARDINS: Thank you.

CO-HEARING OFFICER DODUC: And at this time, Miss Taber, Miss Emrick -- Mr. Emrick, do you anticipate requesting redirect?

MR. EMRICK: Matthew Emrick, City of Antioch.

I -- I do not at this point.

CO-HEARING OFFICER DODUC: Miss Taber.

MS. TABER: I expect just a few short questions.

CO-HEARING OFFICER DODUC: On what topic?

MS. TABER: Related to the question of the Regional San NPDES Permit, and Chloride increases in the Delta.

CO-HEARING OFFICER DODUC: All right. Well, let's see how I feel after Miss Meserve completes her cross, and we'll determine then whether we take a break or we power through.

If we do power through, we'll take a short break for the court reporter.

MS. MESERVE: Good morning. Osha Meserve for Local Agencies of the North Delta, Friends of Stow Lakes and other Protestants.

I have a couple of questions from each of the three testimonies that Dr. Paulsen provided relating to residence time with respect to the Sac Regional.

Then, with Stockton, some of the statements that have to do with HABs and flows.

And then, with Antioch, the operational scenarios and adaptive management.

CROSS-EXAMINATION BY

MS. MESERVE: Just to clarify, Dr. Paulsen:

On Page 3 of your Sac Regional testimony, which is 31 (sic) -- And maybe this was explained elsewhere.

But up on Page -- Line 3, you mentioned "stored in the ESB." I heard you say "basin." I was wondering if you could explain that a little better. I didn't quite understand what that issue was.

WITNESS PAULSEN: Sure. I'm sorry. The "ESB" stands for "Emergency Storage Basin." Those are basins that are located at the Sacramento Regional Wastewater Treatment Plant. And, ordinarily, they would discharge treated effluent to the river.

When the river flows fall below a certain point, and certainly when they reverse, they can't discharge to the river so they divert the treated effluent into basins. And then when the river flows pick up again, they pump the water out of the basins, blend it with the plant -- the treated effluent from the plant, and discharge it to the river following that reverse flow event.

MS. MESERVE: And I'm sorry. I -- I messed up the projectionist. I was -- I'm asking questions off of Sac Regional's testimony, which is 39. Sorry about

that.

So, just to be clear: They're sized for a certain . . . certain assumptions regarding the need to hold that water. And the concern would be that there may not be enough capacity if conditions changed significantly?

(Exhibit displayed on screen.)

WITNESS PAULSEN: Yeah. Actually, it turns out the basins are large enough to accommodate the flows.

The real concern is that the basins take flows for a variety of reasons. We've only evaluated diversions that happened because of a change --

CO-HEARING OFFICER DODUC: Hold on, Dr. Paulsen.

WITNESS PAULSEN: I'm sorry.

CO-HEARING OFFICER DODUC: Miss Ansley has --

MS. ANSLEY: Yeah.

CO-HEARING OFFICER DODUC: -- an objection.

MS. ANSLEY: I think -- I think I'm objecting that this is outside the scope of Dr. Paulsen's rebuttal.

I do recall extensive case-in-chief testimony regarding the workings of the Sac Regional Plant and the -- the holding tanks, but I don't believe a

connection's been made to Dr. Paulsen's testimony here as opposed to -- I can't remember the name of the witness who -- who got in-depth about the size of the holding tanks and the discharge of the effluent.

CO-HEARING OFFICER DODUC: Miss Meserve, I don't think you were asking about the holding tanks, but --

MS. MESERVE: Well, yeah. I was just -- There was an undefined term and I heard her mention it, so I was just trying to clarify for my understanding what the concerns were.

I don't have any more questions about this issue. That was helpful what Dr. Paulsen provided, so . . .

CO-HEARING OFFICER DODUC: Then move on.

MS. MESERVE: And I'd like to go to the residence time portion of your testimony now for Sac Regional as well.

And I have an exhibit that's in the LAND index that's LAND-91, which is the Page 8-198 from the Final EIR. And it is a table from -- showing residence time, which I think is referenced and related to the testimony here.

Dr. Paulsen --

CO-HEARING OFFICER DODUC: Could we wait until

it comes up, Miss Meserve?

MS. MESERVE: Oh, I'm sorry.

CO-HEARING OFFICER DODUC: LAND number?

MS. MESERVE: It's LAND-91.

CO-HEARING OFFICER DODUC: 191.

MS. MESERVE: I'm sorry. 91.

CO-HEARING OFFICER DODUC: All right. Okay.

MS. MESERVE: Sorry. We're getting up there in the numbers.

(Exhibit displayed on screen.)

MS. MESERVE: And if you scroll to the table that's down a couple -- one or two pages.

(Scrolling through document.)

MS. MESERVE: There we go. That's Table 8-60a from the Final EIR.

Dr. Paulsen, have you reviewed this table from the Final EIR?

WITNESS PAULSEN: Yes.

CO-HEARING OFFICER DODUC: Hold on, please.

Miss Ansley.

MS. ANSLEY: Well, I was kind of waiting for a connection.

Dr. Paulsen never refers to the DWR's calculation of residence time. She refers to her own calculations of residence time, which are separate and

distinct, and she refers to DWR's use of velocity.

There may be an on-point question there generally about residence time and DWR calculations, but Dr. Paulsen does not provide any testimony regarding this chart or this analysis or these specific numbers.

CO-HEARING OFFICER DODUC: So let's see where Miss Meserve is going and, hopefully, she'll make that connection.

MS. MESERVE: Say, for -- And you're familiar with the data included in this testimony?

WITNESS PAULSEN: Yes.

MS. MESERVE: I'm sorry. The table.

WITNESS PAULSEN: This table. Yes. We -- We have reviewed them.

And, in response to a question earlier today, this is one of the pieces of information that we reviewed where -- Miss Ansley had asked about what additional analysis we had done of residence time.

This is the table I was referring to when I said that we had reviewed DWR's analysis of residence time and determined that our analysis was pretty consistent with theirs.

CO-HEARING OFFICER DODUC: But was this specifically in your rebuttal testimony?

WITNESS PAULSEN: I believe it was entered -- I don't know that it was referenced in the rebuttal testimony.

But we -- I believe it has been entered as an exhibit by Stockton as well at -- because we used it.

CO-HEARING OFFICER DODUC: My -- My question is to whether or not you actually referenced it in your rebuttal testimony because -- My attorney will probably have to write terminology for this.

But answers in response to cross does not expand the scope of rebuttal testimony.

So, was this specifically in your rebuttal testimony?

WITNESS PAULSEN: (Examining document.)

I don't think so. I'm just trying to confirm that.

I mean, it certainly was in our thoughts and in our mind when we prepared this.

CO-HEARING OFFICER DODUC: So it's part of the basis for your rebuttal testimony.

WITNESS PAULSEN: Oh, absolutely, yeah.

MS. MESERVE: Well, and I think it relates back to the table that she prepared, which she agrees with her prior opinions with respect to residence time.

So, this is related to the table in

Sac Regional-31, Page 10 --

CO-HEARING OFFICER DODUC: Miss --

MS. MESERVE: -- as well.

CO-HEARING OFFICER DODUC: -- Ansley, I'm going to allow it as it forms the basis of her rebuttal testimony.

MS. ANSLEY: And I would just like to, for the record, renew -- renew my objection as outside the scope.

MS. MESERVE: And, to your knowledge, Dr. Paulsen, did DWR model residence time for CWF H3+?

WITNESS PAULSEN: If they did, I haven't seen those results.

MS. MESERVE: And do you know which of the model scenarios presented by DWR in this table that we're showing, Table 8-60a, are closest to CWF H3+?

WITNESS PAULSEN: I believe it would likely be H3.

MS. MESERVE: And in this table, is the XC mean existing condition?

WITNESS PAULSEN: That's my understanding, yes.

MS. MESERVE: And then corresponds to EBC1 in the analysis that you did?

WITNESS PAULSEN: I believe that DWR's

existing condition is EBC1, whereas we looked at EBC2 for an existing condition. And the difference between the two of them is whether they include Fall X2 or not.

But both are current baseline as opposed to future baseline conditions.

MS. MESERVE: And, then, so EBC1 did not include Fall X or -- sorry -- did include Fall X2 to be clear.

WITNESS PAULSEN: Sorry. EBC1 did not include Fall X2. EBC2 did include Fall X2.

MS. MESERVE: And, then, do you -- does the State Water Project and the Central Valley Project currently operate to Fall X2 --

WITNESS PAULSEN: Yes.

MS. MESERVE: -- in real life?

CO-HEARING OFFICER DODUC: Miss Ansley.

MS. ANSLEY: Yeah. I'm going to renew my objection.

At no point has -- in her rebuttal testimony has Dr. Paulsen provided any critique of DWR's methodology or the modeling scenarios compared here for our calculation of residence time.

Again, her rebuttal testimony relies solely on her distinct and separate calculations of residence time done by a different methodology and then a

discussion of DWR's use of maximum and -- maximum channel velocities.

So, I still am objecting that this is well beyond the scope and now starting to stray into EBC1 versus EBC2 versus DWR's calculations here in the FEIR.

CO-HEARING OFFICER DODUC: I have to say I agree that it's starting to stray, Miss Meserve.

Before, I allowed you to continue because you were exploring the basis of Dr. Paulsen's testimony. Now you're going into further detail of what her opinion is in terms of what Petitioners did or didn't do.

So let's -- let's go back and focus, please.

MS. MESERVE: Right.

What I'm -- What I'm trying to focus on is the analysis that Dr. Paulsen did and to contrast or maybe it's similar to what was done in the Final EIR.

So I don't think that --

CO-HEARING OFFICER DODUC: But that's not in her rebuttal testimony.

MS. MESERVE: She does discuss residence time. And because we're kind of at a later phase of this hearing, obviously, we have to go back a couple layers, for instance, to the S -- Sac Regional-31 in order to see what these bases are. So --

CO-HEARING OFFICER DODUC: We've --

MS. MESERVE: -- I've been trying --

CO-HEARING OFFICER DODUC: -- gone through this. Cross is limited to the scope of the rebuttal testimony.

(Pause in proceedings.)

MS. MESERVE: So, are you saying that I would not be allowed to ask Dr. Paulsen to compare the results that she relied on in making her opinions that are provided in this piece of rebuttal testimony to the EIR table that I have asked to pull up?

CO-HEARING OFFICER DODUC: Beyond the scope of her rebuttal testimony.

MS. TABER: It's -- I heard Dr. Paulsen say that she considered this in forming -- this information in the Final EIR in forming her opinion and she's presented a comparative analysis.

We don't have information from the EIR about CWF H3+, but it -- It seems to me that Ms. Meserve's question's asking -- or if I -- I don't know exactly what she's intending to ask.

But she -- It sounds like she wants to compare the results -- seems within the scope of Dr. Paulsen's testimony because she's providing an overall opinion, and this was part of the basis for her opinion.

CO-HEARING OFFICER DODUC: But not a comparison between those two, unless Dr. Paulsen can point to that in her testimony.

WITNESS PAULSEN: No, it's not explicitly in the testimony.

I mean, again, as we discussed earlier, it informed the testimony, it informed our interpretation and confidence in our own calculations of residence time, but I did not discuss it explicitly. We were trying to keep our rebuttal testimony concise.

CO-HEARING OFFICER DODUC: Miss Ansley?

MS. MESERVE: Isn't a part of the testimony -- sorry -- that -- She's rebutting testimony that DWR presented in Part 2 case in chief, which talks about how CWF H3+ has the same results as the results that they got for these other scenarios that were presented earlier, so that's kind of also why it's relevant.

MS. ANSLEY: I would point out that nowhere in her rebuttal testimonial does she even cite this table.

That perhaps in her Part 2 case in chief, she may have provided a reason why had he chose to calculate residence time under a different methodology. And perhaps in that testimony, those questions were relevant.

But, here, what she is doing is presenting her

analysis of residence time and the conclusions from that.

MS. MESERVE: Well, can I ask --

CO-HEARING OFFICER DODUC: Hold on.

I have ruled. It is outside the scope of her rebuttal testimony.

Move on, Miss Meserve.

MS. MESERVE: May I ask her whether she relied on a similar methodology as the Final EIR did in calculating what she presented here in her rebuttal?

MS. ANSLEY: I would argue that she can ask her what she actually relied on, not framing it in terms of --

CO-HEARING OFFICER DODUC: We are going to take a lunch break. I've had enough of dealing with lawyers.

But, Dr. Paulsen, please answer the question of whether you rely on . . .

What was it again, Miss Meserve?

MS. MESERVE: I guess, yeah, what I was trying to get at is:

Do you consider the methodology you used in making your calculations to be similar as to what was in the Final EIR, Table 8-60a.

MS. ANSLEY: Same objection.

CO-HEARING OFFICER DODUC: Sustained. Because whatever you answer, it's -- the basis for that is not in your rebuttal testimony.

(Pause in proceedings.)

MS. MESERVE: She does discuss the number of days where residence time is increased in the comparison, so I --

CO-HEARING OFFICER DODUC: You are welcome to ask her about her rebuttal testimony.

MS. MESERVE: About -- Okay.

CO-HEARING OFFICER DODUC: I'm going to assume that, as lawyers, you all are more familiar than a mere Engineer with what "within the scope of rebuttal testimony" mean.

MS. MESERVE: Okay. Well, for now, let's move on and see if I can circle back to it.

So, looking at your testimony for Stockton, if we could, which also addresses some of the --

(Exhibit displayed on screen.)

MS. MESERVE: -- issues with residence time and HABs formation.

On Page 5 of that testimony, Stockton-61 --

(Exhibit displayed on screen.)

MS. MESERVE: -- you refer to the sloshing tidal system.

You disagree, however, on Page 4, with the DWR-1035 approach of considering the maximum velocity and absolute values to determine residence time; is that correct?

WITNESS PAULSEN: Yes. We disagree with how they used velocities to infer how much flushing would occur.

MS. MESERVE: And when you mention the sloshing in the tidal system, do you have any opinion as to whether the sloshing of the tides, as you frame it -- and maybe you can describe it better -- would help -- might help prevent HABs formation, or do you think that it doesn't prevent HABs formation?

WITNESS PAULSEN: I'm not sure I know exactly how to -- I'm not sure I understand exactly the question that you're ans -- asking.

The sloshing refers to the tidal motion of water within the system. And, so, you'll get a flood tied where water goes into the system; and then you'll get an ebb tide, where water moves out.

And the velocities will vary from positive to negative, and from high to low, over the course of the tidal cycle.

But, when we are talking about flushing or residence time, we need to look at the net motion of

the water. So not how fast it moves when the tide's coming in or when the tide's coming out, but as a net. As it sloshes around, how long it remains in the system.

That's the relevant parameter for algae formation.

MS. MESERVE: And the fact that the Delta, in most of it, is -- is tidal in nature doesn't preclude the formation of HABs, in your opinion; does it?

WITNESS PAULSEN: Oh, clearly not. I mean, it's been tidal since -- I mean, it's always tidal, because that's -- You know, I think we talked about this in the prior testimony in past sections of this.

That's a function of the pull of the sun and the moon on the earth, and so that's been happening for a long time. And, yet, even though that happens, we still get Microcystis blooms in the Delta.

So clearly the tidal velocities by themselves are not enough to prevent Microcystis blooms.

MS. MESERVE: And then still sticking with Page 5. On Lines 16 and 17, you mention that the residence times --

(Exhibit displayed on screen.)

MS. MESERVE: -- increase, particularly in July through October.

When you mention residence times, in what location or locations are you referring to?

WITNESS PAULSEN: The way we evaluated residence times, we were looking essentially at Delta mean residence times.

So we did not conduct independent modeling to evaluate residence times in different parts of the Delta, and they do vary somewhat.

But this was a Delta-wide mean in order to understand whether -- what general changes would occur in residence times as a result of the Proposed Project.

MS. MESERVE: And, then, are you aware that in the July-through-October -- or at least July-through-September time period is when the proposed northerly Delta bypass flows are only proposed to be 5,000 cfs under the initial Operating Criteria?

WITNESS PAULSEN: I would have to look at my Operating Criteria cheat sheet to confirm that.

MS. MESERVE: We could look at DWR-1143 Second Revised, which may help answer that question.

CO-HEARING OFFICER DODUC: And you're going to link that to her rebuttal testimony now?

MS. MESERVE: She's opining about the residence times going up in July through October. And so I'm trying to dig into what some of the reasons

behind that may be.

MS. ANSLEY: She -- She provides no opinion in her testimony to link residence time and -- and operations any deeper than . . .

I'm trying to find even where she linked residence time and operations in her testimony.

CO-HEARING OFFICER DODUC: So, Dr. Paulsen, what was the basis for your opinion in that line that Miss Meserve just referenced?

WITNESS PAULSEN: Oh, I'm sorry. Which line was that?

MS. MESERVE: 16 through 17.

CO-HEARING OFFICER DODUC: Can we go back to Dr. Paulsen's testimony.

MS. ANSLEY: Page 5, Line 13 to 20, is the complete paragraph.

WITNESS PAULSEN: Okay. I was relying on the information that we summarized for Delta residence time, which is contained in Stockton-62.

And I know we discussed the basis for that, that went into the DWR results and, you know, the consistency that I don't think --

MS. MESERVE: Well --

WITNESS PAULSEN: -- we should --

MS. MESERVE: -- wouldn't the --

WITNESS PAULSEN: -- talk about.
MS. MESERVE: Wouldn't the modeling for CWF H3+ include as an input the bypass flows that are applicable during those months?
WITNESS PAULSEN: Yes. I mean, each model run has its own Operational Criteria.
The thing that I don't remember off the top of my head is exactly which Operational Criteria pertain in which months to which scenarios. I would --
CO-HEARING OFFICER DODUC: Which would --
WITNESS PAULSEN: -- have to look that up --
CO-HEARING OFFICER DODUC: -- indicate to me that it's not relevant to your rebuttal testimony.
WITNESS PAULSEN: It's relevant in the sense that it's already incorporated in the DSM-II model runs --
CO-HEARING OFFICER DODUC: But it's not --
WITNESS PAULSEN: -- but I did not consider that separate and apart.
CO-HEARING OFFICER DODUC: Okay. All right.
WITNESS PAULSEN: Although we do talk about two or three things that make the CWF H3+ run different operationally from the other runs. And I think they're summarized in all three of these pieces of testimony very generally, but that's the sense in which I relied

upon it.

CO-HEARING OFFICER DODUC: Okay.

MS. MESERVE: Is it your opinion that the amount of water coming down the river, the Sacramento River, has an influence on residence time; does it not?

WITNESS PAULSEN: Yes, it does, because it's one of the main inflows to the Delta.

MS. MESERVE: And so if, hypothetically, the bypass flow was increased from, say, 5,000 cfs to some higher number, that could help decrease residence time; couldn't it?

CO-HEARING OFFICER DODUC: Miss Ansley.

MS. ANSLEY: I'm -- I'm happy if Miss Meserve links that to the calculation in the methodology that Dr. Paulsen employed.

So, the question as it stands, I'm not happy with going beyond the scope of her rebuttal testimony trying to alter hypo -- you know, if -- if inflows had been calculated differently by Dr. Paulsen, but I think that question could be linked potentially.

I'm not sure Miss Meserve is thinking the same way I am, but to what Dr. Paulsen actually assumed in her calculations.

But nowhere does Dr. Paulsen link operations of the Cal WaterFix. What she does is, she calculates

residence time for CWF H3+.

CO-HEARING OFFICER DODUC: Dr. Paulsen's testimony was fairly contained, I thought, and now we're expanding it into operations, which is definitely beyond the scope.

Miss Des Jardins.

MS. DES JARDINS: I would just like to say that, since CWF H3+ is an operational scenario and A is an operational scenario, that the assertion that Dr. Paulsen's testimony is not linked to operations is fundamentally incorrect.

So, you know, I -- I think one should look -- The basis of her opinions is looking at these operational scenarios and comparing them, and they do have multiple assumptions in there.

And I think to the extent that an Operational Criteria is directly -- potentially directly linked to residence time or another -- or velocity or something that she directly analyzes, that the question should be allowed.

CO-HEARING OFFICER DODUC: We're taking a lunch break.

We will return at 1:05.

(Lunch recess at 12:05 p.m.)

* * *

Friday, August 24, 2018 1:05 p.m.

PROCEEDINGS

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CO-HEARING OFFICER DODUC: All right. It is 1:05. We are back.

Housekeeping matter, Mr. Mizell?

MR. MIZELL: Yes, please.

So, earlier, you asked about any objections we might have to Mr. Williams' testimony. We will be objecting to large portions of his testimony but not in its entirety.

CO-HEARING OFFICER DODUC: Okay.

Miss Meserve, we are continuing with your cross-examination.

I will remind you again that we are not going to go beyond the scope of Dr. Paulsen's rebuttal testimony.

Yes, you may question the basis of her conclusions in her rebuttal testimony, but you may not then take that answer, ask her to do comparative analysis, and go beyond that.

Likewise, you are not allowed to delve deeply into operational aspects which Dr. Paulsen has already said she did not consider closely in preparing her rebuttal testimony.

MS. MESERVE: Good afternoon.

Well, I would like to start where I left off.

I think that, Susan, just to clarify -- And maybe we could look at Miss Paulsen's testimony for Stockton, which is Stockton-61.

(Exhibit displayed on screen.)

MS. MESERVE: And -- And I'm looking in particular down at Lines 24 to 26.

And she's discussing that the modeling uses the operational scenario that the modeling is using. And so I just want to make sure that we're on the same page.

But I think I'm allowed to ask about what goes into that and how her opinions relate to the operations, because she is a modeling expert and there are inputs into the modeling.

And then she cited DWR-1069, which is the modeling inputs for the various parameters.

And my question has to do with bypass flows again, and so I would like to proceed with that question, unless that somehow is not within the scope, which I believe it is.

CO-HEARING OFFICER DODUC: Repeat that.

MS. MESERVE: Okay. So, the question where we left off, which I believe I didn't get an answer to,

just with the background I just provided of the fact that her testimony is based on the operational scenario.

CO-HEARING OFFICER DODUC: A lot of things are based on operational scenarios.

MS. MESERVE: Well, let's look at DWR-1069, just --

CO-HEARING OFFICER DODUC: Let's not.

MS. MESERVE: Well, my question is --

MS. DES JARDINS: If --

CO-HEARING OFFICER DODUC: No.

MS. DES JARDINS: Could we --

CO-HEARING OFFICER DODUC: Let me -- Miss Meserve --

MS. DES JARDINS: -- pull up Miss -- her testimony?

CO-HEARING OFFICER DODUC: No, we cannot.

MS. DES JARDINS: Which is what Miss Meserve is referring --

CO-HEARING OFFICER DODUC: Let's let Miss Meserve conduct her cross-examination, please.

MS. MESERVE: Is there an objection right now?

CO-HEARING OFFICER DODUC: I'm still trying to understand, Miss Meserve, why -- if you are still proceeding down a path that is in direct conflict with

the ruling I just issued, so explain.

MS. MESERVE: Okay. I am -- I am not trying to do that. I am trying to ask questions that are within the scope of cross which I consider this is to be a modeling expert who has relied in her testimony on the DWR modeling of CWF H3+.

And so my question was -- where we left off, was:

Would increasing the North Delta bypass flows potentially decrease the residence times that you found in your analysis and are concerned about?

And the reason why I think it's within the scope --

CO-HEARING OFFICER DODUC: Hold on.

And where in her analysis does she reference bypass?

MS. MESERVE: Bypass flows are part of the Operational Criteria and CWF --

CO-HEARING OFFICER DODUC: And where in her analysis -- in her rebuttal testimony, does she include analysis and discussion and testimony about bypass flows?

MS. MESERVE: Bypass flows are included within CWF H3+.

We're talking about the modeling. And so if

we would like to go to the DWR-1069 that she cites on Page 2, Line 25 --

CO-HEARING OFFICER DODUC: And we have been here, and we've been here with previous witnesses and previous cross-examination.

The modeling for CWF H3+ is expensive -- expansive, yes, and expensive, too, I'm sure. And we are not going to delve into all the aspect and operational . . . assumptions involved with the modeling.

We are going to focus on what Dr. Paulsen testified to in her rebuttal testimony. And to the extent that these questions goes towards the basis of those opinion -- direct basis of those opinions, then they would be within the scope of cross-examination.

MS. MESERVE: She concludes on Page 5, Line 18 through 20, that the CWF H3+ would have impacts on residence time.

She based that testimony on her citation to DWR-1069, which is a similar table as to DWR-1143-Revised but is the prior version of that, potentially.

So, my question has to do with how you would change --

She's testified about a problem with increased

incidence of harmful algal blooms. I'm asking her about what might address that problem that she's identified.

CO-HEARING OFFICER DODUC: And that is outside the scope of her rebuttal testimony.

(Pause in proceedings.)

MS. MESERVE: I'll move on to my next question. I do not think it is outside the scope.

Are you aware, Dr. Paulsen, with respect to your concern about HABs formation, that the Final EIR includes no mitigation for potential impact of increases in HABs formation?

CO-HEARING OFFICER DODUC: Miss Ansley.

MS. ANSLEY: Jolie-Anne Ansley, Department of Water Resources.

I would raise the same objection.

Nowhere does Dr. Paulsen dis -- She discusses impacts that she has perceived for the Cal WaterFix, but nowhere does she talk about Mitigation Measures or, frankly, any of those measures in the FEIR.

Her -- Her presentation in Sections 2 and 3, which are her HAB formation sections, if we want to call them that, merely -- merely actually update her critique from her case in chief and now she is adding in the results of her analysis for CWF H3+.

There are actually very little conclusions -- I mean, there are conclusions.

There are very little conclusions expansively regarding mitigating -- Certainly there are no conclusions regarding mitigation of HAB formation.

CO-HEARING OFFICER DODUC: Sustained.

(Pause in proceedings.)

MS. MESERVE: For your conclusion, Dr. Paulsen, on Page 5, Lines 18 through 20 of the Stockton-61 testimony --

(Exhibit displayed on screen.)

MS. MESERVE: -- does that take into account any Mitigation Measures or other changes that would occur with respect to HABs formation?

WITNESS PAULSEN: We considered that only in the most general sense. So this analysis was focused primarily on residence times and temperature and the amount of flushing that would happen within the Delta, and how those factors would influence the likelihood -- likelihood of Microcystis blooms.

MS. MESERVE: And are you aware of any actions that would be taken by Petitioners to try to reduce HABs formation?

MS. ANSLEY: Same objection.

CO-HEARING OFFICER DODUC: Same ruling.

(Timer rings.)

MS. MESERVE: On Page 6 of your testimony --

CO-HEARING OFFICER DODUC: Do you have further questions that are beyond -- that are within the scope of Dr. Paulsen's rebuttal testimony?

MS. MESERVE: All of my questions are within the scope. I shall proceed with additional questions and try to wrap things up. If I may have 10 minutes, please.

CO-HEARING OFFICER DODUC: 10 minutes.

MS. MESERVE: On Page 6 of your same testimony, you mention that water temperatures -- this is on Lines 16 through 18 -- are expected to be warmer from the air temperatures, and residence times will increase.

And then on Page 7, you talk about the small differences as characterized by DWR.

Why don't you think -- if you don't -- that the -- quotes, these differences should not be considered, quotes, small in the context of HABs formation?

WITNESS PAULSEN: Well, my conclusion is that we don't have enough information on the changes in temperature that are expected in what DWR has presented here for us to be able to agree with their conclusion

that small differences in water temperature between these scenarios would not substantially increase the frequency or magnitude of blooms in the Delta.

In other words, I don't -- Based on the information, the way we have the temperature modeling summarized here, I don't think it's granular enough for -- to support this conclusion.

MS. MESERVE: Do you know numerically what is being referred to as small in the quote that you provide on Page 7 from DWR-1017?

WITNESS PAULSEN: I assume, based on the information that DWR's provided about temperatures, that they based this conclusion on the temperature information that they presented in some of the cited locations in some of the reports that we talked about already.

And those are presented not as daily or weekly or . . . They're long -- They're longer-term aggregate temperatures. All of the temperature information that I've seen is in the form of monthly average temperatures and, actually, long-term statistics generated from those monthly average temperature values.

And, in my opinion, that's not sufficient to support this conclusion.

MS. MESERVE: Would you agree that temperatures that may occur during shorter than monthly, say, averages could lead to HABs, say, over the course of a couple of days, for instance?

WITNESS PAULSEN: Yes.

The data that we have on temperature indicates that temperatures can fluctuate fairly significantly inside of a month's period of time, and that you -- For example, it would be possible to have a month where the monthly average temperature is below the 19-degree Celsius threshold for HAB growth but where a significant fraction of the days within that month have temperatures that exceed that threshold.

And so if you use a monthly average temperature, it isn't granular enough to capture the more detailed temperature signals that we see in the Delta.

And water temperature in the Delta responds to these meteorological inputs on fairly short time-scales. And we see that in the measurements. And you actually see it in temperature modeling when you look at it on those time-scales.

And so that's the reason that I -- In my opinion, the modeling -- The way DWR has presented the modeling does not provide sufficient information to

support the conclusions that they make based on that modeling.

Does that answer the question?

MS. MESERVE: I think so, yes. Thank you.

I'm going to move on to your testimony you prepared for City of Antioch, which is Antioch-600.

And on Page 11 of that testimony, and in Table 4, you discuss that the exports are higher much of the time than -- under CWF H3+ than under B1 scenario.

Do you recall that testimony?

WITNESS PAULSEN: Yes.

MS. MESERVE: And in thinking about the figure that you critique in your testimony, DWR-1010 Figure 2, does it indicate there would be more exports under CWF H3+ than under the boundary scenarios?

WITNESS PAULSEN: I don't remember which figure DWR-1010 --

MS. MESERVE: I think you --

WITNESS PAULSEN: -- is.

MS. MESERVE: -- have it -- Sorry.

I think you have it repeated on Slide 9 of your Antioch PowerPoint.

WITNESS PAULSEN: Oh, I'm sorry. Okay. I know which one you mean.

(Exhibit displayed on screen.)
MS. MESERVE: Sorry. 601, Slide 9.
WITNESS PAULSEN: Yes. Okay.
I'm sorry. Could you repeat the question? I'm with you now.
MS. MESERVE: Do you feel that this figure in your slide that's repeated from DWR's testimony, does it indicate that there could be more exports under CWF H3+ than under B -- Boundary 1?
WITNESS PAULSEN: I don't think that this slide goes directly to exports, per se. It's a -- And it's DWR-1008, just to be clear.
It's a fairly generalized, I think, attempt at summarizing CWF H3+ and where it falls in regard to -- or with relation to the other scenarios that have been modeled.
And because it is so general, I think it's hard to draw broad conclusions from this slide, and that's why we went into the details that are provided here with respect to the individual model runs.
So -- I'm sorry -- I think I lost your question in that --
MS. MESERVE: So --
WITNESS PAULSEN: -- answer.
MS. MESERVE: So would it be fair to say that

you don't believe that this figure shown on Slide 9 of -- of your PowerPoint depicts CWF H3+ as being in the middle of the range with respect to exports?

WITNESS PAULSEN: I don't think this figure was intended to show exports or to make a point about exports explicitly.

I interpret this as more of a -- a point about Delta outflow. And just sort of a general representation of, again, how CWF H3+ relates to the other scenarios.

MS. MESERVE: But it shouldn't -- It should not be taken to indicate exports.

Would that be correct?

WITNESS PAULSEN: Well, I would answer that question just by pointing to the analysis that we did of exports using the model results.

I mean, clearly, the volume of water that's exported from the Delta under CWF H3+ exceeds the volume of water exported under some of these other scenarios in specific months.

MS. MESERVE: On Page -- Back on Pages 2 to 3, you talk about -- in your Antioch 500 -- or 600 testimony, rather -- that you focus on the impacts to the City from CWF H3+.

And those initial Operating Criteria are in

DWR-1069; is that correct?

WITNESS PAULSEN: I believe that's right, yes.

MS. MESERVE: And those Operating Criteria, they comply with the Coordinated Operations Agreement between DWR and Reclamation?

CO-HEARING OFFICER DODUC: Hold on, please.

MR. MIZELL: Yeah. We'd object to the question as being beyond the scope of Dr. Paulsen's testimony.

At no point does she discuss the Coordinated Operating Agreement in her rebuttal.

CO-HEARING OFFICER DODUC: Where are you going with this, Miss Meserve? And link it back to her testimony, please.

MS. MESERVE: I'm trying to look at what the assumptions are in the modeling that she relied on and clarify what -- One of those ingredients is the -- the water quality allocation responsibility between the two Projects, which is --

CO-HEARING OFFICER DODUC: Definitely way beyond the scope of her rebuttal testimony.

MS. MESERVE: I believe it's a similar argument with respect to the other parameters of the modeling, so I won't repeat that since it didn't work before.

On Page 13 of your testimony for City of Antioch, you state that the Adaptive Management Plan only addresses fish and wildlife.

Are you aware of any protections for wildlife in the Adaptive Management Plan?

WITNESS PAULSEN: I don't know how to answer that, except to say that my understanding is that the adaptive management process . . .

There's been testimony here and in written material that it is designed solely for the protection of fish and wildlife.

And I believe it's been asked explicitly whether that adaptive management process will consider M&I uses, and it will not.

So I think that's about as far as I could go there.

MS. MESERVE: Given your concerns about the failure to consider M&I in adaptive management, would you recommend that operational adjustments not be left to the Adaptive Management Plan?

WITNESS PAULSEN: I don't have a recommendation in terms of the Adaptive Management Plan except as I've testified before, that it's unclear to me how that process will work and how decisions will be made that would shift operations away from one scenario

and more toward another scenario.

And so that's the reason that, throughout the testimony I've provided, as well as here, we've evaluated the boundary scenarios, because it appears that it would be possible for the Project to be operated to, in this case, the Boundary 1 scenario.

And I don't understand the criteria or the process that will be used to shift operations, how those decisions would be made, when they would be made, et cetera.

MS. MESERVE: But also given the testimony you provided today, you would also be concerned about even CWF H3+ operational impacts on the various water quality parameters that you looked at; right?

WITNESS PAULSEN: Oh, yes. And the point of the testimony today is to evaluate the water quality impacts of CWF H3+. And it's clear that -- And we don't need to go through it again, but there are impacts.

The point of this opinion is just to say that the other scenarios, as far as I'm aware, have not been evaluated in the context of the Part 2 testimony provided by the Petitioners and yet we know that they may operate to these scenarios.

So the point here is that if they do operate

to the Boundary 1 scenario, it will have water quality impacts.

MS. MESERVE: Thank you.

No further questions.

CO-HEARING OFFICER DODUC: Mr. Ruiz.

MR. RUIZ: I have good news.

Given what I consider to be the clarity of Dr. Paulsen's testimony at this point, I have no questions.

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

Miss Des Jardins.

MS. DES JARDINS: Thank you.

Dierdre Des Jardins with California Water Research.

I'd like to bring up Dr. Paulsen's Stockton testimony, which I believe is Stockton-61.

(Exhibit displayed on screen.)

CROSS-EXAMINATION BY

MS. DES JARDINS: And on Page 6, at 2 to 5 --

(Exhibit displayed on screen.)

MS. DES JARDINS: -- you discuss DWR presenting temperature information in the long -- in the form of long-term monthly averages and that this -- there's problems with this granularity.

I also wanted to ask if you're aware that the CalSim inputs to the DSM-II model are basically projecting monthly averages?

WITNESS PAULSEN: Yes, I am aware of that.

MS. DES JARDINS: So this -- this also has granularity? Does this also cause granularity issues?

CO-HEARING OFFICER DODUC: Let's hold on here.

I'm not sure where she's going with this, but let's -- let's hold on, Miss Ansley.

Are you able to answer, Dr. Paulsen?

WITNESS PAULSEN: Only to the extent that, consistent with prior discussions that we've had in these hearings, that we know that the models, CalSim in particular, uses a time step that, you know, is a monthly time step.

When that model output is used as input into DSM-II, we do get information on a more granular basis, and there are limitations to that approach, to using the monthly output as input to DSM-II. So I don't know how to answer it beyond that.

It's the system that we have, and I think those of you who work with these data sort of understand the limitations. And I think that's probably what DWR means when they talk about using things in a comparative sense, because we understand

there are limitations, but there's still value in using the model results to evaluate different scenarios.

I don't know if that's responsive to your question.

MS. DES JARDINS: Yeah.

But, like, for example, with temperature exceedances, there are limit -- are there limitations of the -- the monthly modeling that affect whether you would see particular temperature exceedances?

WITNESS PAULSEN: My understanding of the temperature modeling is that it is capable of producing output on a shorter time-scale -- it does produce output on a shorter time-scale -- but that DWR has chosen to present the information from the temperature model in terms of monthly averages.

MS. DES JARDINS: Okay. And then your -- I -- Your testimony for Stockton, part of your assertion is -- You refer to Stockton-63.

And I'd like to bring up Stockton-63.

(Exhibit displayed on screen.)

MS. DES JARDINS: And I'd like to go to the bottom of Page 13, please.

(Exhibit displayed on screen.)

MS. DES JARDINS: And are -- Did you see this paragraph about (reading):

"When the discharge of the inflowing rivers is reduced . . . the temperature . . . in . . . the entire Delta . . . increases . . ."

WITNESS PAULSEN: Yes.

MS. DES JARDINS: So -- So, did this partly inform your opinion that reduced inflows to the Delta could increase temperatures?

WITNESS PAULSEN: Yeah. There are other places in this report, too. Yes, this . . .

It's nice to have a modeling temperature study that does a sensitivity analysis and looks at the different inputs and the sensitivity of temperatures in the water in the Delta to changes in different inputs.

There are other places in this paper as well that lead me to the same conclusion. You know, for example, the paper discusses water temperature in the Southwestern Delta.

Temperatures there tend to be higher than in the rest of the Delta and residence time tends to be longer. And the paper does make an explicit connection between residence time and water temperature such that if -- if the discharge of inflowing rivers is reduced, that's when you increase the residence time of water within the system which, in turn, results in increases

in water temperature.

So, yes, I did review all of this and I think it's all consistent with the opinions that we provided.

MS. DES JARDINS: Let -- Let's go back up to the top --

(Exhibit displayed on screen.)

MS. DES JARDINS: -- to the -- to the first page.

(Exhibit displayed on screen.)

MS. DES JARDINS: And it's called -- It's by the U.S. Geological Survey; is that correct? Or some of the authors are.

WITNESS PAULSEN: One author --

MS. DES JARDINS: Yeah.

WITNESS PAULSEN: -- right.

MS. DES JARDINS: Yeah.

WITNESS PAULSEN: And he was a collaborative effort. I was not involved in it.

MS. DES JARDINS: So -- So would you consider this opinion to be fairly authoritative?

WITNESS PAULSEN: Oh, I -- Yes, clearly. It's a careful, special study. It's, you know, published in a reputable journal, has been through their process.

Yes, I -- I felt very comfortable relying upon it.

MS. DES JARDINS: Okay. Thank you.

And I also . . . You -- I'd like to go back to your testimony, Stockton-61, Page 6 at 19.

(Exhibit displayed on screen.)

MS. DES JARDINS: And you mention that Microcystis blooms occur, and there have been multiple blooms reported recently, and you refer to various locations.

Are you aware that sampling in the surface layer of the Delta showed that the phytoplankton in the San Joaquin River is almost pure Microcystis?

MS. ANSLEY: I'm going to object as beyond the scope of her rebuttal.

I'm not aware that she --

MS. DES JARDINS: Aren't Old and Middle Rivers in the San Joaquin River?

WITNESS PAULSEN: Old and Middle Rivers are channels in the South Delta.

MS. DES JARDINS: Channels in the South Delta.

Are you aware of -- that sampling in the South Delta showed the phytoplankton on the San Joaquin side of the South Delta as almost pure Microcystis?

WITNESS PAULSEN: I'm not aware of that. I'm aware that Microcystis has been sampled and is present in many locations in the Delta, including the South

Delta. But I'm not familiar with the statement you just made.

MS. DES JARDINS: Okay. Thank you.

So, I'd like to go to your -- Page 2 of your testimony for Stockton.

(Exhibit displayed on screen.)

MS. DES JARDINS: And . . . please scroll down.

(Scrolling through document.)

MS. DES JARDINS: Yeah. There we go.

So you say here that you (reading):

". . . Evaluated . . . WaterFix operations under scenario CWF H3+ . . ."

And that you looked at the relation of the operations on CWF H3+ between H -- with H3 and H4 as described in DWR-1069.

WITNESS PAULSEN: Yes, in part.

What we did here was an evaluation of the CWF H3+ model results, and we used the modeling as provided by DWR.

We did look into, in a general sense, what the operational differences were between, say, H3 and H4 and CWF H3+. That was about the extent of the operational analysis that we did.

MS. DES JARDINS: Okay.

(Pause in proceedings.)

MS. DES JARDINS: I'd like to go to Antioch-60 on Page 17, which is -- or, sorry, Antioch -- No, sorry. That's not the correct -- Susan Paulsen's testimony for Antioch.

(Exhibit displayed on screen.)

MS. DES JARDINS: Antioch-600. Apologies. Yeah.

Page 17.

MS. RAISIS: There's only 13 pages.

MS. DES JARDINS: Oh. Well, I've got it up here.

I'm sorry. Page 4.

(Exhibit displayed on screen.)

MS. DES JARDINS: And Line 17.

(Exhibit displayed on screen.)

MS. DES JARDINS: And you mention here . . . that, you know, from your review of DWR-1069, that one of the components that differentiates CWF H3+ is a requirement for combined flow in Old and Middle River; is that correct?

WITNESS PAULSEN: Yes.

MS. DES JARDINS: Are you aware that the initial range of Old and Middle River criteria is proposed to be determined from -- in the future?

WITNESS PAULSEN: I'm not sure I'm aware of that with that granularity.

I do . . . I have a lot of questions about the operations in general as to -- again, as we talked about a few minutes ago --

MS. DES JARDINS: Yeah.

WITNESS PAULSEN: -- how it will be decided, which of the parameters are in play at any point in time, how and when those decisions will be made.

So, in a general sense, I have a lot of questions about the operations.

MS. DES JARDINS: Yes.

And -- And do you feel that that uncertainty -- that the questions is, basically, you would expect that the -- Does that introduce as to uncertainty in whether -- in the model results, particularly DWR's modeling of things like, you know, the flows that you're basing opinions on for CWF H3+?

CO-HEARING OFFICER DODUC: Mr. Mizell.

MR. MIZELL: Yes. I'll object to the question as going beyond the scope.

Miss -- Dr. Paulsen has addressed the . . . potential changes to the Adaptive Management Plan might play out in the future, but at no point does she discuss the -- that there's any uncertainty with the

results as they are modeled.

MS. DES JARDINS: Respectfully, she discusses DWR-1069. I can pull it up, but there's -- which is the modeling assumptions -- documents the modeling assumptions. And so it -- it's clear, and she discusses specific modeling assumptions here.

My question -- And she's described that there is some uncertainty in those. And I'd like to request -- And I would like to just ask a question about how that uncertainty affects her opinion.

CO-HEARING OFFICER DODUC: I think that sounds fair, Mr. Mizell.

Overruled.

MS. DES JARDINS: Yeah. So -- So, you know, there's specific quantitative results based on these assumptions in the scenario which you compared, but . . .

WITNESS PAULSEN: Right. And there are a lot of operational assumptions that go into each of these model runs.

The other part of the Adaptive Management Program that's difficult for me to understand is how all of those decisions will be made.

I don't think there's going to be a committee associated with the AMMP that sits around and says,

"Well, we're at CWF H3+ today. Should we go to Boundary 1 tomorrow?"

I think, instead, they're going to be talking about the individual operational factors based on a whole suite of considerations.

And I don't yet have an understanding for how those decisions will be made, and that does introduce uncertainty in terms of understanding what the impacts of this Project will be.

That's why we've evaluated the full range of scenarios that we've been provided with.

MS. DES JARDINS: And given that uncertainty, is there the possibility that the effects on residence time, for example, that you've evaluated could be worse?

WITNESS PAULSEN: Yes, I think it's possible.

We haven't done individual model runs to evaluate all of the various permutations of those Operational Criteria that could occur in the future.

We are relying on DWR's model results here in order to characterize what we think the range of outcomes might be. But there are combinations and permutations of all those different criteria that could result in different outcomes than we've evaluated here.

MS. DES JARDINS: And -- And could one of the

outcomes be potentially higher increases in chlorides than shown in CWF H3+ in your analysis, given this uncertainty?

WITNESS PAULSEN: Yeah. Again, I think it is possible but we haven't evaluated -- we haven't done independent analyses of different permutations in order to come up with a scenario that would produce higher chloride concentrations.

So I think it's possible, but I can't point you to what conditions would produce that result.

MS. DES JARDINS: Because there hasn't been evaluation of the potential range of these different Operational Criteria?

WITNESS PAULSEN: There's been some evaluation in the scenarios that we've prevented here, but I'm not aware of operational -- Sorry. I'm not aware of model runs that evaluate additional or different permutations of all of the operational parameters.

CO-HEARING OFFICER DODUC: Okay. I'm going to start reining in --

MS. DES JARDINS: Okay. That -- That's fine.

CO-HEARING OFFICER DODUC: -- your questions --

MS. DES JARDINS: Yes, thank you.

CO-HEARING OFFICER DODUC: -- Miss

Des Jardins.

MS. DES JARDINS: So . . .

I -- I just had one -- actually, one followup question, which was . . .

Are you aware that the operations assume that pumping at the South Delta intakes is preferred during July through September?

CO-HEARING OFFICER DODUC: I don't think she mentions that in her testimony.

MS. DES JARDINS: Could -- We could pull up -- Does your -- Your test -- Your testimony references DWR-1069; correct?

WITNESS PAULSEN: It does. And it does also -- I think right in front of us at the bottom of the screen here -- talk about South Delta export restrictions so --

MS. DES JARDINS: Yeah.

WITNESS PAULSEN: -- there's a little consideration of it.

CO-HEARING OFFICER DODUC: But you don't discuss it in detail.

WITNESS PAULSEN: No. We've discussed it in general terms, and those operational parameters have been, I assume, incorporated into the model runs that were evaluated.

But we did not do any additional sensitivity analyses on these parameters.

I've forgotten your question. I'm so sorry.

MS. DES JARDINS: It's about preferential diversions in the South Delta from July through September, that DWR-1069, Page 4.

CO-HEARING OFFICER DODUC: Miss Ansley.

MS. ANSLEY: Yeah. I think -- One of my objections is beyond the scope.

The testimony being referenced on the screen here is October and November. It's citing a specific parameter that Dr. Paulsen apparently specifically considered.

If the question is something related to Number 2 there, I am good. But I think all of this testimony is beyond the scope of Dr. Paulsen's rebuttal testimony, which is constrained to a very tight analysis that she did.

CO-HEARING OFFICER DODUC: It really is, yes.

She does reference DWR-1069 but does that -- that does not mean that, then, DWR-1069 in its entirety is open for cross-examination.

You must limit it to what she specifically cites to in her rebuttal testimony.

WITNESS PAULSEN: In the rebuttal testimony

that we provided as Antioch 602, there is an analysis of the total amount of exports in every month in the 16-year simulation period.

And from that, you can just observe. You can, you know, look at the bar chart to figure out where the water was exported from, whether it was from the South Delta diversions or the North Delta -- sorry -- the South Delta export locations or the North Delta diversion.

CO-HEARING OFFICER DODUC: And if Miss Des Jardins wished to ask questions on that table -- that exhibit, that would be fine.

MS. DES JARDINS: So this is Antioch-1062?

WITNESS PAULSEN: No, sorry. Antioch-602.

MS. DES JARDINS: Antioch-602. Let me go look at that one.

(Exhibit displayed on screen.)

MS. DES JARDINS: Let's see. I'm in Stockton. Let me go -- Where's Antioch-602? Oh, the export totals.

And so you have here . . .

I see. So you have the -- Let's -- Let's go ahead and pull up Page -- go to Page 2 where you have graphs.

(Exhibit displayed on screen.)

MS. DES JARDINS: And this looks like a critical year -- Let -- Let's scroll down and see what the colors mean.

(Scrolling through document.)

MS. DES JARDINS: And if we could scroll out a little so we could see the legend and . . .

(Exhibit displayed on screen.)

MS. DES JARDINS: So . . . Let's see.

So -- So my understanding is, green is Boundary 1; is that correct?

WITNESS PAULSEN: The bars are provided in order. So if you went from the leftmost bar, that's a dark green. That's EBC2.

MS. DES JARDINS: Yeah.

WITNESS PAULSEN: All of the exports there, obviously, from the South Delta because it's an existing condition. We don't have North Delta diversions.

The same -- The next bar over is blue and that's the NAA.

And the same thing: By definition all of the exports have to be from the South Delta.

MS. DES JARDINS: Okay.

WITNESS PAULSEN: And then the bars are stacked --

MS. DES JARDINS: Okay.

WITNESS PAULSEN: -- moving to the right of that.

And the bottom of the bar indicates what's coming out of the South Delta, and the top of the bar indicates what's coming out of the North Delta.

So, the bars are ordered the same way the legend is. So, the first double bar on the left side is B -- Boundary 2. They know you have H4. Then you have CWF H3+, then you have H3, and then the bar on the right side, the far right, is the set of bars for Boundary 1.

MS. DES JARDINS: And so on the far right, it looks like . . .

In -- Let's . . .

Looking at a normal year, that -- it looks like, in April and May of Water Year 1980, normal, that there's actually more exports from the South Delta than -- than current?

Oh. Oh, no, that's the North Delta diversions. Never mind.

So -- So, they have increased exports from the North Delta diversions in the spring.

Is that -- In April and May under --

WITNESS PAULSEN: Right.

If you look at 1980, April and May, you can see that, for Scenario CWF H3+, the majority of the water that's removed in those months would be removed from the North Delta diversion locations.

MS. DES JARDINS: Yeah. And . . .

And in the far right, there could be -- the far right column shows that, under Boundary 1, there could be essentially significantly more exported in those months than under existing conditions?

WITNESS PAULSEN: Right.

So, for the Boundary 1 scenario for April and May of Water Year 1980, the total height of those bars for Boundary 1 is higher than for all the other bars, so the total amount of water exported for Boundary 1 is higher than it would be for all the other scenarios.

And then the shading indicates that the majority of that water under Boundary 1 would be exported from the South Delta.

MS. DES JARDINS: And -- And, sim -- And, similarly, in June, it looks like the -- Under Boundary 1, the combined exports are more than under existing conditions?

WITNESS PAULSEN: Yes.

MS. DES JARDINS: And in September as well?

WITNESS PAULSEN: Yes.

MS. DES JARDINS: And the annual average as well for 1980?

WITNESS PAULSEN: The annual average, yes. The Boundary 1 scenario would export the most water of all the scenarios shown here.

MS. DES JARDINS: And . . . So . . . There's . . .

It looks like -- And then scrolling down in 1981, it looks like the -- the dry year, it looks like there's more exported under Boundary 1 than under existing conditions?

WITNESS PAULSEN: For the year as a whole, yes. Individual months are a little different.

MS. DES JARDINS: Okay. And in -- in July, there's more exported in Boundary 1 than under existing conditions?

WITNESS PAULSEN: Yes, and --

MS. DES JARDINS: And --

WITNESS PAULSEN: -- under all the scenarios.

MS. DES JARDINS: And -- And in January, February and March?

WITNESS PAULSEN: Yes, that's correct.

MS. DES JARDINS: And, so, 1981 is a dry year; correct.

WITNESS PAULSEN: Yes.

MS. DES JARDINS: And so -- So, there's actually more being taken out of the Delta in the dry year than under existing conditions.

WITNESS PAULSEN: Yes. In this dry year, yes.

MS. DES JARDINS: Yes.

WITNESS PAULSEN: I haven't looked at all of them to answer that question, but in 1981 -- Water Year 1981, yes.

MS. DES JARDINS: Okay. So -- Yeah. Thank you. This is -- This is helpful.

So, in -- in some months in some years, it looks like it -- the Project exports more -- more -- potentially exports more water under Boun -- quite a bit more than under the existing conditions.

Would that be a correct conclusion from these graphs?

WITNESS PAULSEN: Yes. There's certainly years and months where that is true.

MS. DES JARDINS: The other thing I wanted to ask you about, because of assumptions, is about the mix between North Delta and South Delta in this.

So . . . Are you aware that the assumptions in the model assumes, in July, August and September, that there will be preferential use South Delta diversions during those months?

WITNESS PAULSEN: It depends on the year.

MS. DES JARDINS: Yeah.

WITNESS PAULSEN: In some years, yes.

In . . .

MS. DES JARDINS: Can I bring up exhibit -- Your -- Your -- You do refer to DWR-1069, but I'd like to bring up Exhibit DWR-1069, Page 4, to refresh your memory.

(Exhibit displayed on screen.)

MS. DES JARDINS: Page 4, please.

(Exhibit displayed on screen.)

MS. DES JARDINS: Can you read that column under H3?

WITNESS PAULSEN: Yes, I see that.

MS. DES JARDINS: So, did you refer this in -- review this in preparing your testimony?

WITNESS PAULSEN: Yes.

MS. DES JARDINS: So, it says that there's a preferential pumping to minimize potential water quality degradation in South Delta channels; is that correct?

WITNESS PAULSEN: For H3, yes.

MS. DES JARDINS: And that it -- CWF H3+ has the same assumptions?

WITNESS PAULSEN: Yes.

MS. DES JARDINS: Are -- Are . . .

Petitioners' witnesses testified that this assumption -- this operational assumption is discretionary.

I wanted to ask: Would that affect the graphs that you prepared in -- in that exhibit and the mix of North and South Delta diversions?

CO-HEARING OFFICER DODUC: Mr. Mizell.

MR. MIZELL: Yes.

I'd like to object as beyond the scope of her testimony.

Her rebuttal testimony displays the output of the modeling, but at no point does she provide a critique of the assumptions behind the modeling output that she displays and discusses in terms of quantified output.

CO-HEARING OFFICER DODUC: To what extent, Dr. Paulsen, did you consider the potential discretionary aspect of this in conducting your analysis?

WITNESS PAULSEN: Most of the analysis -- Well, all -- I think almost all of the analysis that we're presenting here is based on these five or six model runs.

What I can say is that, if you change your

assumptions, I would expect the model to reflect changes as well. So if different assumptions had been made, I would expect the model results to probably look different also, but we didn't do any sort of a quantitative evaluation of that.

MS. DES JARDINS: Nor did the Petitioners.

WITNESS PAULSEN: I'm not aware of it.

MS. DES JARDINS: That concludes my cross-examination questions.

CO-HEARING OFFICER DODUC: Thank you.

Miss Taber, you indicated you had some limited redirect -- you would like to do limited redirect based on questions asked of Dr. Paulsen on the permitting -- NPDES Permits.

MS. TABER: Yes. I have just a couple quick questions.

CO-HEARING OFFICER DODUC: Okay.

REDIRECT EXAMINATION BY

MS. TABER: So, Dr. Paulsen, you were asked by the Department of Water Resources whether the NPDES Permit for the Sacramento Regional Wastewater Treatment Plant is subject to changes based on receiving water quality in the Delta.

Do you recall those additions?

WITNESS PAULSEN: Yes.

MS. TABER: Does your professional experience include water quality analysis associated with NPDES permitting for the Sacramento Regional Wastewater Treatment Plant?

WITNESS PAULSEN: Yes.

MS. TABER: And how far back does that experience extend?

WITNESS PAULSEN: Well, I've worked on analyzing the water quality of Regional San's discharge to the Sacramento River since probably at least the late 1990s.

MS. TABER: Okay. So -- And that includes several NPDES Permit renewals?

WITNESS PAULSEN: Yes. It includes a couple of Master Plans and a water quality analyses associated with planned improvements to the Treatment Plant.

I have also attended a number of the NPDES permit hearings at the Central Valley Regional Board.

MS. TABER: Okay. So -- Thank you.

And, in the course of your work, did parties who received water exported from the Delta raise objections and file legal challenges arguing that the Sacramento Regional Wastewater Treatment Plant discharge could have adverse impacts in the Delta and in the vicinity of the South-of-Delta export pumps?

CO-HEARING OFFICER DODUC: Hold on, please.

Mr. Mizell.

MR. MIZELL: I'd like to object as beyond the scope of my -- my cross-examination.

My cross-examination on NPDES permits were about receiving waters in close proximity to San -- Sac Regional's discharge and whether or not water quality monitoring in Antioch, Contra Costa Canal, and other spots in the Western Delta, were a component of the NPDES Permit.

At no point did we go into whether or not, during NPDES hearings, there were any sort of comments on impacts to water quality of other diverters from the Delta.

In fact, we didn't ask about the NPDES permit hearings whatsoever.

CO-HEARING OFFICER DODUC: But you asked about NPDES.

Miss Taber.

MS. TABER: Right. And it -- So, all of these questions -- The questions go to the relevance of her data and analysis at locations in -- within the Delta to Treatment Plan Operations and injuries to Regional San.

CO-HEARING OFFICER DODUC: And how does the

hearing that you're asking about tie into that?

MS. TABER: So she -- If you'll permit me to complete my questions --

CO-HEARING OFFICER DODUC: Ah, you'll make the link.

MS. TABER: -- I think we'll make the link.

CO-HEARING OFFICER DODUC: Okay.

MS. TABER: I believe so.

So, in your experience in those NPDES permitting . . . arena and occasions where you conducted water quality analysis, were arguments raised by parties who received water exported from the Delta that salinity in the Delta result in increased salinity that might be linked to the Regional San's discharge a concern?

WITNESS PAULSEN: Yes. In the master planning process, in CEQA processes, in NPDES Permit hearings, and there are probably other instances as well.

MS. TABER: And did those parties argue that more stringent effluent limitation should be imposed on Sacramento Regional Wastewater Treatment Plant due to concerns about increased salinity in the Delta?

CO-HEARING OFFICER DODUC: Hold on.

Miss Ansley.

MS. ANSLEY: Yeah.

I'd like to renew the Department's objection. This is beyond the scope.

And the question was pertaining to what was actually in the NPDES Permit, not what input people gave to what should be in the NPDES Permit.

So, it was a simple question as to whether there were conditions in the permit that -- I mean, I'm sure we could call up the permit.

But it's a question about what the contents of the permit was. What people complained about, whether it was addressed or not addressed by the Regional Board, is well beyond the scope of that question.

CO-HEARING OFFICER DODUC: She has a point.

Miss Taber, if you can explain to me how your . . .

MS. TABER: Well, the point is that changes -- The Department appears to be critiquing Dr. Paulsen's testimony for its focus on water quality changes in the Delta, her testimony offered on behalf of Regional San.

And the point is that parties in those prior proceedings who export water from the Delta have argued that there should be more stringent effluent limitations. They are injured by changes.

And some of those arguments have resulted in changes to the permitting process.

CO-HEARING OFFICER DODUC: I see, Miss Taber. But you're making inferences based on cross-examination questions, and inferences cannot expand the scope.

So sustaining the objection.

MS. TABER: That's all.

CO-HEARING OFFICER DODUC: All right. Any recross?

MS. ANSLEY: (Shaking head.)

CO-HEARING OFFICER DODUC: All right. Any questions for Dr. Paulsen?

All right. No questions?

Thank you, Dr. Paulsen.

MS. TABER: I think, at this point, we need to offer to move her testimony into the record.

CO-HEARING OFFICER DODUC: Please do.

MS. TABER: So I would like at this time to move Exhibits SRCSD-39, -40 and -41 into the record, as well as Exhibits Stockton-61, -62, -63, -64, -65 and -66.

CO-HEARING OFFICER DODUC: Any objections?

Not seeing any, they've been so moved. They are now in the record, or whatever the correct terminology is.

(City of Stockton's Exhibits 61, 62, 63, 64, 65 & 66 received into the record)

MR. EMRICK: Matthew Emrick for the City of Antioch.

I'd move to move Exhibits 600, 601 and 602 into the record.

CO-HEARING OFFICER DODUC: Any objections?

Not seeing any, they are in the record.

(City of Stockton's Exhibits 600, 601 & 602 received into the record)

MS. TABER: And that concludes our testimony.

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

MS. TABER: Thank you.

CO-HEARING OFFICER DODUC: Before we adjourn for the day, though, let's -- And I'm glad Miss Meserve is still here.

What I have for Monday is: We will begin the Save the California Delta Alliance.

And at this time, I am estimating roughly two hours because, in addition to pre -- presenting direct testimony, I have: DWR conducting cross for 30; Miss Des Jardins for 20 to 25; and Miss Meserve for about 25.

So that means we will then next move on to PCFFA and LAND. That will be Mr. Oppenheim, Miss Des Jardins and Mr. Stokely.

I am estimating about one and a half hours because the only cross-examination I have is DWR for 20, and San Luis Delta, Group 4, for 30.

MS. ANSLEY: And I would like to at this time amend our cross-examination estimate for PCFFA/LAND.

I estimate that we could have about -- and I will endeavor over the weekend to -- to make this more efficient -- but I think we're at an hour to an hour and 15 minutes. And that would be for Mr. Oppenheim and Miss Des Jardins.

CO-HEARING OFFICER DODUC: All right.

That might take us to, what, another two, two and a half hours, which means we will also get to Miss Daly and North Delta C.A.R.E.S.

At this time, is there -- are there any estimates of cross-examination for North Delta C.A.R.E.S?

(Pause in proceedings.)

MS. ANSLEY: At this point, the DWR does not have cross-examination for Miss Daly. We may have objections, but that would take no more than a couple of minutes.

CO-HEARING OFFICER DODUC: All right.

MS. ANSLEY: I apologize. Would you like me to repeat that?

CO-HEARING OFFICER DODUC: Please, so that we have it in the recording.

MS. ANSLEY: I apologize.

At this point, the DWR does not have cross-examination for Miss Daly for North Delta C.A.R.E.S. I believe she's the only witness.

I think we do -- We may have a couple of objections, but they would be resolved in a couple minutes, I believe.

CO-HEARING OFFICER DODUC: All right.

MS. DES JARDINS: Dierdre Des Jardins, Group 37.

And I would have 20 to 25 minutes estimated.

CO-HEARING OFFICER DODUC: I'm sorry?

MS. DES JARDINS: I would estimate -- sorry -- 20 to 25 minutes.

CO-HEARING OFFICER DODUC: Which means, Miss Meserve, that it's possible we will get to Snug Harbor on Monday, in which case, then, you would not want to switch with them; is that correct?

Because my understanding was, you wanted your witnesses to be on Tuesday.

MS. MESERVE: Yes. I mean, I think we were trying to get Miss Des Jardins' witness up here for Tuesday, if possible, since he has a long travel time.

So if -- I think that -- I know we do the practice of switching, but it might be just easier to make an order.

And, yeah, I think Snug Harbor could go on Monday afternoon as well. So we can let her know, if she's not watching at this moment, that she's kind of on call for that. And that's -- So you'd like to make sure to pack her in if there's time, is your thought on it?

CO-HEARING OFFICER DODUC: Let me ask.

What is the proposed cross for Snug Harbor?

MS. ANSLEY: That's up to much debate.

I think it's about 15 minutes, but I anticipate that there will be objections, so you may wanted to buffer that with a couple more minutes, then.

CO-HEARING OFFICER DODUC: All right.

MS. DES JARDINS: With respect to the joint panel with Save Our Sandhill Cranes, one of the witnesses, Tom Williams, has to travel up from Southern California. And he's leaving for Texas on the 30th, and so, if possible, we were trying to ensure that he could go by no later than Tuesday, which was part of the reason for the switch -- for the switch with Snug Harbor.

And so the issue would be, if he didn't -- if

that panel did not switch with Snug Harbor, the --

CO-HEARING OFFICER DODUC: I'm trying to ascertain that, if you would let me continue.

MS. DES JARDINS: Okay.

CO-HEARING OFFICER DODUC: All right. So, then, assuming we get through Snug Harbor on Monday, on Tuesday, we'll begin with Clifton Court.

What is the estimated cross for Clifton Court?

MR. MIZELL: 10 minutes.

CO-HEARING OFFICER DODUC: Okay. Then we will get to County of Sacramento.

And what is the estimated cross for County of Sacramento?

MS. DES JARDINS: 20 minutes for Clifton Court, and 20 minutes for County of Sacramento.

MR. MIZELL: I don't actually have my notes for County of Sacramento.

I would -- If I were to take a guess, I'd say no more than 30 minutes, but we will attempt to revise that to be more accurate on Monday.

CO-HEARING OFFICER DODUC: Okay. Which means, then, that I expect we will get to the -- for now -- last panel -- well, not last, but the panel of -- of Mr. Wirth, Mr. Fries and Mr. Williams on Tuesday.

And what is the anticipated cross for that

panel? Because if it's going to take a long time, I might suggest we move that panel up to earlier in the day.

MS. MESERVE: Yes. That's what I was hoping you might be able to do, is to put the -- that panel maybe at the beginning or at least toward the beginning of that day just to ensure that we could get through it and that those witnesses could go on to the other obligations that they have.

CO-HEARING OFFICER DODUC: It depends on the cross.

MS. ANSLEY: We have no objections to, obviously, them going earlier in the same day.

I believe for Mr. -- We have limited questions for Mr. Williams. Mr. Fries, I think that it's about 10 minutes. You know, I'm still working on Mr. Wirth. I think that it would be no more than 20 minutes, I hope, but I hope I haven't just underestimated that by 10 minutes, so . . .

CO-HEARING OFFICER DODUC: Okay. All right. It looks like we might even get to -- Who's after that? That would be -- Would that be Mr. Burke?

That would be Mr. Burke that would be up next, and we already have estimates for Mr. Burke that I have in my notes.

All right. I think that's enough planning or projecting that we can do today.

Thank you all. Have a good weekend. We'll see you 9:30 on Monday.

Are we back in this room? Let's make sure we're not in Rancho Cordova or something like that.

MS. McCUE: No, we're not in Rancho Cordova.

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

(Proceedings adjourned at 2:11 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: September 15, 2018

_____
Candace L. Yount, CSR No. 2737