BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

CALIFORNIA WATERFIX WATER RIGHT CHANGE PETITION HEARING)

JOE SERNA, JR. BUILDING

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

COASTAL HEARING ROOM

1001 I STREET

SECOND FLOOR

SACRAMENTO, CALIFORNIA

PART 2

Friday, March 23, 2018

9:30 a.m.

Volume 20

Pages 1 - 205

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

Computerized Transcription By Eclipse

APPEARANCES

CALIFORNIA WATER RESOURCES BOARD

Division of Water Rights

Board Members Present:

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

Staff Present:

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

PART 2

For Petitioners:

California Department of Water Resources:

James (Tripp) Mizell
Jolie-Anne Ansley

INTERESTED PARTIES:

For County of San Joaquin, San Joaquin County Flood Control and Water Conservation District, and Mokelumne River Water and Power Authority, Central Delta Water Agency, South Delta Water Agency (Delta Agencies), Lafayette Ranch, Heritage Lands Inc., Mark Bachetti Farms and Rudy Mussi Investments L.P.:

Thomas H. Keeling

For Sacramento Regional County Sanitation District:

Paul S. Simmons

APPEARANCES (Continued)

INTERESTED PARTIES (Continued):

For East Bay Municipal Utility District (EBMUD):

Jonathan Salmon
Fred Etheridge

For State Water Contractors:

Stefanie Morris

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

John Herrick, Esq.

I N D E X

I N D E X (Continued)

I N D E X (Continued)

Friday, March 23, 2018 9:30 a.m.

PROCEEDINGS

---000---

CO-HEARING OFFICER DODUC: If everyone would please take a seat. It is 9:30.

And welcome back to this Water Rights Change Petition hearing for the California WaterFix Project.

I am Tam Doduc. Joining me shortly will be Chair Marcus and Co-Hearing Officer Felicia Marcus. And to her right sitting there now is Board Member Dee Dee D'Adamo. To my left, Andrew Deeringer, Conny Mittenhofer -- Mitterhofer -- sorry -- and Hwaseong Jin.

And Mr. Hunt is also assisting us today.

Since I do see some new faces, please take a moment -- well, actually new and returning faces, I guess. Please take a moment and identify the exits closest to you.

In the event of an emergency, an alarm will sound. We will evacuate using the stairs.

If you're not able to use the stairs, flag down one of the security people and you'll be directed to a protective area.

As always, please speak into the microphone and begin by identifying yourself and stating your

affiliation for the record since this meeting is being recorded and being Webcasted.

Thank you, Candace, our court reporter, for coming back.

If you would like a copy of the transcript prior to the end of Part 2, please make your arrangements directly with her.

And, finally and most importantly, please take a moment and put all your noise-making devices to silent or vibrate.

All right. Housekeeping.

Oh, first of all, there are doughnut holes -- yes -- in the back of the room provided by Mr. Deeringer if you haven't had your sugar level raised this morning yet.

Today, we are going to first hear a Policy Statement from Supervisor Miller from San Joaquin County. Thank you for joining us.

And then we will get to the case in chief for Sacramento Regional County Sanitation District. I expect that will go until at least our lunch break.

And then upon the completion of that panel, we -- if we have time, we'll move to East Bay MUD and, if possible, complete that before adjourning for the week.

And just so -- For planning purposes, should we are able to do that, we will resume Monday first with Grassland Water District's remaining witness, Dr. Petrie, and then moving on to the San Joaquin Tributary Authority, City of Antioch, City of Stockton, et cetera, et cetera.

Any other housekeeping matters before we begin?

All right. Supervisor Miller.

Am I to surmise, Supervisor Miller, due to your presence today, Mr. Keeling has reverted back to wearing a tie on Friday?

MR. KEELING: Well, actually, Hearing Officer Doduc, that is not true.

CO-HEARING OFFICER DODUC: Oh.

MR. KEELING: I would have worn a cardigan, but I also have a court appearance.

And I realize Mr. Herrick's in the audience and he may question the veracity of that statement, the veracity of my excuse.

And in that respect, I do have something in common with Stormy Daniels. Like her, I am willing to submit to a polygraph.

(Laughter.)

CO-HEARING OFFICER DODUC: Thank you,

Mr. Emrick (sic), and Mr. Keeling, for honoring the other Court's dress code today.

SUPERVISOR MILLER: Good morning.

I'm San Joaquin County Supervisor Cathy Miller.

Thank you for allowing me the opportunity to address you regarding the proposed Twin Tunnels Project this morning.

The Delta is not a mere conduit in a statewide plumbing system, although some Project proponents will say just that. The Delta is much more. And no county has a larger amount of the Delta within its boundaries or has a greater stake in the future of the Delta than San Joaquin County.

The Delta supports a $5.2 billion annual agricultural industry, and some 40 percent of those farms are in San Joaquin County. A large portion of the Delta's $750 million recreational economy is centered in our county.

Transportation infrastructure within the Delta and the Delta levee system are vital to our local and regional economies, as well as to the safety and welfare of thousands of our neighbors living in and near the Delta.

But beyond mere statistics, the unique

esthetic, cultural, and environmental characteristics of the Delta are critical to our county today and to our future generations.

I'm not an attorney or a witness in this hearing, so I'm sure you'll be happy to know I'm not going to summarize evidence or provide testimony on Delta ecology, hydrodynamics, or groundwater resources.

But any lay person with some common sense who has reviewed the Change Petition and listened to the Proponents' arguments can recognize that this is an elaborate and dangerous bait and switch.

I'm not referring just to the fact that the Project has changed significantly during the course of this hearing or to recent revelations about a single Tunnel Project being pitched as phased construction.

I'm referring to the fact that most of the key decisions governing the Project's impacts in the Delta have been deferred into the future.

Proponents have admitted that preliminary engineering has not even begun. Rather than present this Board with complete designs or any Operational Criteria, the Petitioners say, "Trust us to operate the Project in compliance with future regulations."

Never mind that the broad outlines proposed for management provide a central role for water export

interests but barely a chair in the scorner of the room for the Delta counties, Delta farmers, or Delta communities.

Never mind that there's no assurance of adequate funding for this program or that it includes no meaningful safeguards against the same kind of political pressures that have resulted in the failure of other management programs.

Never mind that, in the future, the criteria and rules can be changed to satisfy the priorities of the water export interests.

Trust us? Really?

The Project you're being asked to approve today now is not the Project California is likely to get, either during its construction or during its operations. The very definition of a bait-and-switch.

In closing, I leave you with this:

The Delta is the largest estuary on the West Coast of the Americas, a unique national treasure, rich in history, with an extraordinary diversified culture and home to many protected species.

The damage that construction and operation of this Proposed Project will inflict upon the Delta will be permanent. There will be no turning back, no do-overs.

You may be all that stands between ongoing efforts to responsibly address Delta challenges and a future in which the collapse of our Delta is spoken of the way we now speak of the Owens Valley.

You sit as guardians of this treasure, this public trust asset of incalculable importance to the people and natural communities in the Delta counties and to future generations of Californians and Americans.

Please exercise your responsibility wisely, without undue influence from those who want to see you base your decision on politics rather than due care for the future of this great estuary and the people who live in it.

Only if you do that will we be able to direct our public and private resources into genuine solutions which address the needs of the Delta ecosystem and California's water supply issues.

Thank you again for the opportunity to speak to you today.

CO-HEARING OFFICER DODUC: Thank you very much for joining us.

Sac Regional, if you could bring up your witnesses.

I will ask that you remain standing once you

find the right -- yes -- and raise your right hands, please.

Michael Melady,
Prabhakar Somavarapu,
Ruben Robles,
Susan Paulsen
and
Tom Grovhoug,

called as witnesses by Sacramento Regional County Sanitation District, having been duly sworn, were examined and testified as follows:

CO-HEARING OFFICER DODUC: Thank you.

MR. SIMMONS: I have no status.

CO-HEARING OFFICER DODUC: You're -- You're fine to sit there as well.

MR. SIMMONS: Good morning, Chair Doduc and --

CO-HEARING OFFICER DODUC: I'm sorry. Before you -- Before you begin, let me ask:

Do you wish to make an Opening Statement? Because you did submit a written Opening Statement.

MR. SIMMONS: Yes. And it will be the abbreviated version of the written Opening Statement.

CO-HEARING OFFICER DODUC: All right. Let's begin with that.

MR. SIMMONS: All right. So --

CO-HEARING OFFICER DODUC: And is your microphone on?

MR. SIMMONS: I believe that it is.

CO-HEARING OFFICER DODUC: Perhaps move it closer to you.

MR. SIMMONS: Hello?

CO-HEARING OFFICER DODUC: Is the green light on?

MR. SIMMONS: Yes.

CO-HEARING OFFICER DODUC: Ah, much better. Thank you.

MR. SIMMONS: Now that I've pushed the button.

OPENING STATEMENT

MR. SIMMONS: Okay. Good morning, Chair Doduc and Hearing Officer and Chair Marcus and Member D'Adamo and staff.

I'm Paul Simmons, counsel for Sacramento Regional County Sanitation District.

And Regional San has no general position with respect to WaterFix other than, if approved, the Project must not directly or indirect impose new burdens, costs or operational constraints on Regional San and its customers.

The Project as proposed does not meet this

test and should be denied unless conditions are imposed to protect Regional San and its customers, who are the citizens of the Sacramento region.

Regional San has submitted Part 2 testimony for five witnesses. Today, Mr. Melady will authenticate his testimony, and the other four witnesses will provide oral summaries of their testimony.

I'm pleased to announce they are all Engineers and they're all uniquely qualified to speak on the subject matters of their testimony.

CO-HEARING OFFICER MARCUS: Did they all go to Cal?

MR. SIMMONS: I'm sorry?

CO-HEARING OFFICER MARCUS: Did they all go to Cal?

MR. SIMMONS: You can -- You can ask them all but as I -- I see some -- No, no. I see some U.C. Davis; I see some Cal Tech; I see all kinds of things.

Dr. Susan Paulsen did not go to Cal, and she's known to the Board and she's an expert on hydrology and the hydrodynamics of the Delta and has done work associated with Regional San for many years.

Tom Grovhoug has multiple years of water quality regulatory experience, wastewater engineering,

and also worked for the circumstances of Regional San and wastewater discharge entities throughout the Central Valley.

Mr. Reuben Robles is the Director of Operations for Sacramento Regional, so he is the Mayor of that city known as the Sacramento Regional Wastewater Treatment Plant.

And in his spare time, he's running a little Project called the EchoWater Project.

Then Prabhakar Somavarapu, whose name I get right most of the time, is the District Engineer for Regional San, the person with overall responsibility for interaction with the 16-member Board, policy, planning, operations, finance, and he has experience himself in -- in the operations of the District on the operational side.

The verbal testimony of Dr. Paulsen and Mr. Robles will deal with one thus far unmitigated impact of the WaterFix.

Operation of WaterFix will inevitably require Regional San to divert effluent to storage more often and to a greater degree than it otherwise would.

In other words, instead of discharging directly to the river, it will be -- be required to store effluent more frequently and in greater amounts.

There are two consequences of that: One is that there are just simply operational and maintenance costs associated with doing so; and the second is that the capacity, the storage capacity that Regional San has built at its own expense is for its operations and for its operational flexibility. And WaterFix will, in effect, appropriate and require Regional San to dedicate some of its storage capacity to the WaterFix Project. Those two impacts, if they are to occur, should be compensated.

The verbal testimony of Mr. Grovhoug and Mr. Somavarapu will address foreseeable regulatory burdens on Regional San that can be expected as a result of WaterFix.

It -- It has not escaped our attention that the proposed intakes are directly below the point of discharge for the Regional Wastewater Treatment Plant.

Based on past and current history, one can expect this fact to be prominent in every five-year renewal of the NPDES Permit for Regional San.

And I would just suggest that, if we inverted history, and we assume that the WaterFix intakes were already there today, and Regional San came along and said: "How about this? We would like to discharge treated municipal wastewater a few miles upstream of

those intakes. And it'll be state of the art. You'll have advanced secondary treatment, nitrification, denitrification, tertiary filtration and disinfection."

Bless their hearts. Would the State Water Contractors say: "Fine. We're good with that. We don't need anymore"?

We submit that they would demand more, and we don't see a reason that those pressures are likely to go away if -- if the intakes are located there.

There's a substantial likelihood of increased regulatory burden due to the presence of those intakes.

We have suggested terms that could be included in an approval, or actions that could be taken, to provide protection for Regional San under those circumstances.

But those are the two subjects matter of the oral testimony to be given today. And -- And we'll start with -- with Mr. Melady.

DIRECT EXAMINATION BY

MR. SIMMONS: Mr. Melady, do you have Regional San -- or SRC-15 (sic) -- a copy of SRC-15 (sic)?

CO-HEARING OFFICER DODUC: I'm sorry, Mr. Simmons.

Before you proceed, now that you've finished with your opening statement, how much time do you

project needing for your direct?

MR. SIMMONS: I'd say 40.

CO-HEARING OFFICER DODUC: 40 minutes? All right.

MR. SIMMONS: Mr. Melady, are you familiar with SRC-15 (sic) which is identified as your written testimony?

WITNESS MELADY: Yes, I am.

MR. SIMMONS: And is that your testimony?

WITNESS MELADY: Yes, it is.

MR. SIMMONS: Mr. Robles, are you familiar with Exhibit SRCSD-28?

WITNESS ROBLES: Yes, I am.

MR. SIMMONS: And is SRCSD-28 your testimony?

WITNESS ROBLES: Yes, it is.

MR. SIMMONS: Is SRCSD-34 a true and correct copy of your PowerPoint presentation?

WITNESS ROBLES: Yes, it is.

MR. SIMMONS: And I'm going to go ahead and let them do and then we'll just -- Mr. Grovhoug, is Exhibit SRCSD-17 a correct copy of your statement of qualifications?

WITNESS GROVHOUG: Yes, it is.

MR. SIMMONS: And do you have Exhibit SRCSD-37 which is identified as your written testimony?

WITNESS GROVHOUG: Yes, I do.

MR. SIMMONS: And directing your attention to Page 7, Line 11, of he SRCSD-37, is there a correction that needs to be made?

WITNESS GROVHOUG: Yes, there is.

MR. SIMMONS: And could you describe that.

WITNESS GROVHOUG: In -- In that line, Ken Abraham whose design -- on the EchoWater Design Team, there was an error made and he was referred to as a WaterFix Design Team member. That should say EchoWater Design Team member.

MR. SIMMONS: And with that correction, is SRCSD-37 your testimony?

WITNESS GROVHOUG: Yes, it is.

MR. SIMMONS: And are Exhibits SRCSD-18 through 26 true and correct copies of documents referenced in your written testimony?

WITNESS GROVHOUG: Yes, they are.

MR. SIMMONS: Is SRCSD-35 your PowerPoint presentation that you'll be providing today?

WITNESS GROVHOUG: Yes, it is.

MR. SIMMONS: And, Mr. Somavarapu, is Exhibit SRCSD-32, are you familiar with that Exhibit SRCSD-32?

WITNESS SOMAVARAPU: I am.

MR. SIMMONS: And is that your testimony?

WITNESS SOMAVARAPU: It is.

MR. SIMMONS: And is SRCSD-33 a true and correct copy of an EchoWater Progress Report referenced in your written testimony?

WITNESS SOMAVARAPU: It is.

MR. SIMMONS: Okay. And now we'll just allow the witnesses to proceed in sequence, starting with Dr. Paulsen, followed by Mr. Robles, then Mr. Grovhoug and then Mr. Somavarapu.

WITNESS PAULSEN: Do I need to verify my exhibits as well?

MR. SIMMONS: Oh, I'm so sorry.

Dr. Paulsen, is -- is SRCSD-30 a true and correct copy of your Statement of Qualifications?

WITNESS PAULSEN: Yes, it is.

MR. SIMMONS: And are you familiar with SRCSD-29?

WITNESS PAULSEN: Yes.

MR. SIMMONS: And is SRCSD-29 your testimony?

WITNESS PAULSEN: Yes, it is.

MR. SIMMONS: Is Exhibit SRCSD-31 a true and correct copy of your Expert Report regarding impacts of the WaterFix on Sacramento Regional County Sanitation District?

WITNESS PAULSEN: Yes, it is.

MR. SIMMONS: And is SRCSD-38 a true and correct copy of your PowerPoint presentation you'll be using today?

WITNESS PAULSEN: Yes.

MR. SIMMONS: Okay. Thanks.

WITNESS PAULSEN: Could we please have SRCSD-38.

(Exhibit displayed on screen.)

WITNESS PAULSEN: Thank you.

And next slide.

(Exhibit displayed on screen.)

CO-HEARING OFFICER DODUC: Mr. Hunt, 38.

Does 38 actually say 36 on it?

MR. SIMMONS: No. Chair Doduc, the --

(Exhibit displayed on screen.)

CO-HEARING OFFICER DODUC: We have the right file up now, Mr. Simmons.

MR. SIMMONS: Okay. Great.

WITNESS PAULSEN: Okay. And two slides down, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: The -- This testimony and the Expert Report include four different opinions.

Opinions 1 through 3 rely in large part on information that was submitted as part of Part 1 of

these hearings for other parties.

So, in brief, they deal with the residence time in the Delta, and the fact that the DSM-II model runs performed by DWR indicate that residence time within the Delta will increase.

Opinion Number 2 has to do with the increase in residence times and the increase in water temperatures that are expected to occur as a result of WaterFix, which will lead to a greater likelihood of Microcystis blooms within the Delta in the future.

And Opinion 3 has to do with the salinity of water in the Delta and the fact that DWR's model runs show -- some of them show increases in salinity in the western part of the Delta and also within the interior Delta.

I would like to skip over the detail of those opinions and move to Opinion 4, which is new information for -- for this part of the hearing.

Opinion 4, I believe, starts on Slide 19.

(Exhibit displayed on screen.)

WITNESS PAULSEN: All right. And Opinion 4 has to do with the frequency and the duration of reverse flow events at Regional San's diffuser.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: In brief, the -- Regional San has a diffuser in the Sacramento River at Freeport. It's a 74-port diffuser located perpendicular to the flow of the river. And treated wastewater is discharged to the river via this diffuser.

Now, when net Sacramento River flow rates are low, tidal forcing at the lower end of the system can force the Sacramento River to flow backwards at Regional San's diffuser location.

When the river flows backwards, Regional San stops discharging water to the river and diverts that flow to the storage basins.

When the river flow again resumes in the downstream direction, what's discharged to the river is the treated effluent directly out of the Wastewater Treatment Plant and some portion of the water that has been stored in those basins during the reverse flow event.

And that discharge continues until those basins are empty. And then diversions to the emergency storage basins can resume -- will resume again during the next reverse flow event.

What we did as part of this proceeding was to evaluate a few different parameters that are measures of the number and the duration and the intensity of

these diversion events for different WaterFix operational scenarios.

We only simulated diversions to those basins that would result when the flow in the river drops to a low value or reverses.

Regional San does institute diversions for other purposes. They can divert when temperature conditions are outside of the -- the limits specified in the Discharge Permit, and they can discharge -- they can divert to the basins for both planned and unplanned maintenance. We did not simulate those.

So what we did was to use the model output from DSM-II, the simulations of the river flows at Freeport, and to count up the number of reverse flow events, the percent of time in the overall 16-year period of record that DWR simulated that diversions will occur, the percent of time in that 16-year period that there will be water in those basins, and the cumulative volume of water that then would have to be pumped out of those basins over a 16-year period.

So if we could go to the next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: Here, we're looking at a summary of results for two of those different parameters.

On the top row of the table is the number of diversion events that would occur in the 16-year simulation period. And I'll just walk through this one in a little bit more detail.

EBC2 is the existing-condition scenario that we simulated. And over that 16-year period, you can see that there would be 2,704 diversion events.

Under the No-Action Alternative, which, again, is with 15 centimeters of sea-level rise, there would be an increased frequency of diversions and there would be 3,571 diversions.

The next row of the table shows the change in the number of diversion events. So what you can see is that relative to the EBC2 scenario, the existing condition scenario, the No-Action Alternative would have diversion events occurring about 32 percent of the time more.

The other scenarios that we simulated for this part of the testimony were the Boundary 1 and the Boundary 2 scenarios and the H3 and the H4 scenarios.

And what you can see is an increased occurrence of the number of diversion events for each of those scenarios.

So for the Boundary 1 scenario, we would have 3930 diversion events; for Boundary 2, 3901; for H3 and

H4, just under 4,000 and just under 4200 diversion events in the 16-year period.

And you can see that, relative to the EBC2 scenario -- this is the next row of the table -- the number of diversion events would increase by between 32 percent for the NAA and 55 percent for the H4 scenario.

The next row in the table looks at the increase in the number of diversion events compared to the No-Action Alternative. And you can see that these WaterFix scenarios increase the frequency of diversions -- or the number of diversions, excuse me, by between 9 and 17 percent.

The next parameter that we looked at was the percent of time that a diversion event would be required.

And under the EBC2, you can see a diversion -- diversions would be required 5.6 percent of the time in that 16-year period. That increases to 8 percent for the No-Action Alternative, and up to about 9 percent of the time for the H4 scenario.

So it's an increase of between 4 and 13 percent in the total amount of time in that 16-year period that diversions would occur.

The next slide, you see the last two

parameters that we looked at.

The third is the percent of time that we would have effluent in the basins. In the EBC2 scenario, it would be 11.8 percent of the 16-year period. For the No-Action Alternative, 16.4 percent. And then on up to 18.4 percent of the time for the H4 scenario.

So relative to existing conditions, EBC2, that's an increase of between 39 percent and 56 percent of the time that effluent would be in the basins.

And compared to the No-Action Alternative, it's an increase of between 4 and 12 percent of the time that effluent would be present in the basins.

And then the last measure that we looked at was the cumulative volume of water that would need to be pumped out of the ESBs after these diversion events.

And you can see, for the EBC2 existing condition scenario, just under 64 billion gallons of treated wastewater would have to be pumped out of the basins and back to the river, and that ranges up to just a hair over 100 billion gallons over the time period for the H4 scenario.

Relative to existing conditions, that's an increase of 39 percent for the No-Action Alternative and then up to 56 percent for the H4 scenario.

And then relative to the No-Action

Alternative, that's an increase of between 4 and 12 percent in the volume of water that would have to be pumped out of those basins.

And as -- the next opinion, please. Or the next slide, please.

(Exhibit displayed on screen.)

WITNESS PAULSEN: To summarize this opinion, we expect that WaterFix will increase the frequency and the duration of diversion events due to the change in river flows at the diffuser location.

And as my colleagues here will discuss, that's expected to result in higher O&M costs and the potential for additional odor impacts, as well as taking up some of the storage space that Regional San had previously planned for and built because more water will have to be diverted over increased diversion events than they had envisioned when they planned these facilities.

Thank you.

MR. SIMMONS: Yes, chair Doduc. Now Mr. Robles will address what that means for Regional San.

But I wonder, Dr. Paulsen: You talked about Regional San diverting water to the storage basins during tidal events.

Are there any regulatory drivers for that circumstance that you're aware of?

WITNESS PAULSEN: It's a condition of the NPDES Permit. And essentially the way it works is, when the river flow falls to less than 14 times the effluent flow rate at that instant, then the water must be diverted.

And that condition is in the NPDES Permit because, below those flows, the diffuser doesn't disperse the water sufficiently to meet the water quality requirements in the river.

MR. SIMMONS: Thank you.

Okay. Mr. Robles.

WITNESS ROBLES: Good morning. Can we pull -- Can we pull up the presentation -- excuse me -- SRCSD-34.

(Exhibit displayed on screen.)

WITNESS ROBLES: Again, my name is Reuben Robles. I'm the Director of Operations.

I am responsible for managing the treatment plant, the large pipe interceptors and pump stations that convey the wastewater to the plant, and the EchoWater Project, which I'll touch on in a moment.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS ROBLES: Again, my focus will be the specific impacts to the Wastewater Treatment Plant operations due to WaterFix.

This is an aerial of the wastewater plant itself. We sit in the middle of 3,600 acres, very large land area. The process area, the area you see in front of you, is about 900 acres.

We treat about 133 billion gallons of water per day on the average, and we have a permitted wastewater capacity of 181 MGD.

We have currently a pure oxygen biological process that is being changed out due to the EchoWater Project, and I'll touch on that.

We handle the vast majority of our solids on-site, although we do have a biosolids recycling facility.

And to orient you on this aerial, the Sacramento River is to the west, or to the right, the City of Sacramento is to the bottom of this aerial, or to the north.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS ROBLES: The EchoWater Project is divided up into about 20 smaller projects. The EchoWater Project has a cost of about $1.8 to

$2 billion. It is one of the largest capital improvement projects a history -- in our history, Sacramento history, so it is exceptionally large.

The existing plant, much of what you see there today, was built in roughly 1982. There was actually an old plant there prior to that and then we -- one of our predecessors improved that part and a lot of what you see there was built in 1982.

The reason the plant was built in '82 was, it was a consolidation of over -- over a dozen plants in the Sacramento area that would discharge wastewater to the American River and Sacramento River, so this became the regional plant for the area.

I won't talk on -- about all of these EchoWater Projects but I'll touch on a couple that are very important.

So toward the lower bottom, you'll see the Biological Nutrient Removal Project. This is a project that is required by our Permit to remove -- reduce ammonia and nitrates.

This project is under construction. It is required to be operational by May of 2021. That project alone is over $400 million in construction costs.

And, as I said, we're probably a couple years

into the project and we've got a couple more years to go.

To give you a sense of magnitude, it's very difficult from this aerial to get that sense, but it's a -- think about a football field. That's about 18 football fields in size, that footprint, exceptionally large. And that will take the place of our pure oxygen facility.

So, it's going to be challenging because we're going to be operating a treatment plant with pure oxygen facilities and taking those facilities out of service while we're bringing in this air-activated sludge process into service.

So it's like working on your car while it's moving. So it's going to be very challenging for us, but we're doing a good job so far.

So that's one.

Secondly is up toward the top, tertiary treatment facilities. This will add filtration on the back end of our secondary process.

This is about a $300 million construction project. In fact, we'll take -- we're taking that to our Board for approval on April 11th for approval of the construction Project.

That is -- needs to be, by permit, fully

constructed and operational by May of 2023.

Now, these dates seem like we have a lot of time, but we don't. When you have a $2 billion construction project, all the planning, design, construction and commissioning, really, we need every day of that period of time. So we -- we are pushing hard to stay on schedule and we're doing a good job.

And the project that's most pertinent to this discussion today is toward the lower right, the Flow Equalization Storage Project.

So, this was, as we call, the emergency storage basin. This is where we store flow for different conditions. And the Flow Equalization Storage Project is the project that modifies the storage basins. And I'll talk about that.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS ROBLES: So here's a little closer aerial of that project.

Again, the ESBs, Emergency Storage Basins, already exist but we've expanded the capacity. They used to hold about 290 -- two nine zero -- million gallons. They currently, due to expansion, hold now 400 million gallons of water and then we partitioned them.

So what you see in front of you is what we call C, Basin C. We divided it into three basins. It was one contiguous basin before.

And I'll give you some more detail.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS ROBLES: So, from left to right, we have Basin A, B, C1, C2, C3 and D. Basins A through C are what -- C3 are what we improved through the EchoWater Project, the full equalization project.

So, again, we deepened them. C1, C2, C3 were partitioned. And they are all connected by connective pipes and they overflow from one to the next.

So, for example, when we have to divert primary effluent, so it'll go into Basin A first. It'll overflow weir into B, another weir into C1 and on down the line.

When we bring back the flow, there's pipes that connect these basins and we'll bring it back to the plant for treatment, for full treatment.

D was not improved. It was already a lined basin. It holds about 78 million gallons of water. And that is the basin we use to store treated effluent when we have to divert from the Sacramento River for a variety of reasons.

Dr. Paulsen mentioned the 14-to-1 dilution ratios. So when the river flows fall below that requirement, we store the treated effluent in Basin D.

When the river flow conditions return to their required levels, the flows are higher. And we then return that flow from D, treated water, directly to the river. And so that is how we use Basin D.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS ROBLES: And also the FEQ Project that are made under the Permits is almost done. By the summertime, that Project will be complete.

Okay. So there's a lot of information here. Some of this was covered by Dr. Paulsen. So what I'll -- Let me touch on some things.

So the first row, "Cumulative flow" -- "Cumulative volume pumped out of ESBs."

That was mentioned already. So, for example, current model condition, ESBC2 (sic) over the 16-year period, it was estimated that there will be 64 billion gallons of water stored in those basins and have to be pumped out.

I'll use B1, the WaterFix Scenario B1, as a comparison.

So the modeling indicates over that 16-year

period that the amount of stored water in that ESB-D will then increase to 93 billion gallons.

The next row for those two scenarios, EBC2 for Number of Diversions, base case 2704 -- 2,704. B1 scenario would increase to 3,930. So there's an increase in number of diversions and an increase in total volume of wastewater stored in ESB-D.

The next row. We estimate, based on those two comparisons, ESBC2 (sic) versus B1, that there will be an increase of 45 percent of diversion events from the base flow, B1 versus EBC2, 45 percent increase.

Now, under B1, again, 3930 total number of diversions. That's inclu -- That's an inclusive number of WaterFix as well as our normal diversions. So 31 percent of that increase is -- of that total is attributed to WaterFix.

So, again, we estimate, under the B1, it will be a combination of our -- our diversions and the WaterFix diversions of 3,930. And of that total, 31 percent we attribute to WaterFix.

So, therefore, we estimate that, due to WaterFix, the ESB-D cost, the capital costs that would be attributed to WaterFix, is about $14.1 million. Capital costs.

The way we come up -- came up with the number

is, we had the cost of the FEQ modifications to the basins. That was about $190 million, the Project.

Those basins store a little over 300 million gallons. So we divided the two. We come up with about 59 cents per gallon of capital costs for stored volume.

We apply that 59 cents of capital cost to what the SBDs hold, 78 million gal -- million gallons. And we come up with a cost of about 40 -- forgive me -- $46 million. Total cost ESB-D, $46 million.

So 31 percent of $46 million is what we attribute to -- to WaterFix, which is $14.1 million.

There's many other permutations on that graph, but that gives you an illustration of what we're talking about.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS ROBLES: So that's the capital cost.

We also have some additional O&M costs, annual O&M costs, due to WaterFix.

So, again, we're going to be storing more water in these basins, we project, so we're going to be pumping more water out of these basins during the -- due to projections.

So, again, first row EBC2 versus B1. So we

currently spend, based on modeling, about $62 million in pumping costs, electrical pumping costs, to move water in and out of those basins, base case.

Due to WaterFix, it'll increase to about $90,000 per year, the additional pumping costs.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS ROBLES: We also have to clean those ESB, we project, more frequently. We currently spend about $30,000 a year, not a lot of money, but there will be an increase to about $44,000 for Boundary Condition 1.

Now, again, these are annual costs in comparison to capital. Not a lot, but when you consider these costs will be over the lifetime, every year forever, that over time, they will add up to a fair amount of money.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS ROBLES: So, I want to just touch on a couple things.

First, the capital cost of the take of our ESB-D is significant. Again, I gave you the example B1. That was about $14 million, and there would be a fair amount of O&M over time.

What I did not include over there is something that's hard to quantify, is, we're going to be using our ESB-D pumps more due to WaterFix. They're going to wear out quicker because we're going to use them more often due to WaterFix.

So that could be on the order of 800,000 to up to $4 million in additional capital due to the early consumption of those pumps.

That concludes my presentation.

MR. SIMMONS: Okay. So, now starting with Mr. Grovhoug. We'll move to the regulatory consequences of WaterFix and sort of finish with the diversion to storage part.

WITNESS GROVHOUG: Good morning. If we could bring up Exhibit SRCSD-35, which is a PowerPoint.

(Exhibit displayed on screen.)

WITNESS GROVHOUG: And if you could put up the second slide.

(Exhibit displayed on screen.)

WITNESS GROVHOUG: Thank you.

My written testimony addresses the potential impact that the location and operation of the proposed WaterFix diversion structures will have on future NPDES permit requirements for the Sacramento Regional Wastewater Treatment Plan.

In my opinion, these impacts have not been addressed in either the Draft or Final EIR or other analyses prepared for the WaterFix Project and, therefore, no appropriate mitigation for these potential impacts has been identified or stipulated.

Today, I will highlight just a portion of my written comments, and that deals with Opinion 1 in my written comments.

And I refer now to this slide. The map depicted here was prepared using information contained in the WaterFix EIR/EIS. It shows the location of the SRWPTP discharge near the top of the slide, which is just below the Freeport Bridge.

It also shows the various diversion structure locations that were considered as part of the WaterFix Project. Diversion Structure Number 1 is actually at River -- near River Mile 44, which is about 2 miles downstream of the current discharge.

And then, as you can see, the other options -- alternative locations proceed further downstream.

It's important to note that, for the proposal before you, Structure Number 2, Number 3 and Number 5 are the three, as you well know, as shown here.

And -- And these -- these locations -- Two is about 4 to 5 miles downstream. Three is about 7 miles,

and five is about 9 miles. So all within the relative vicinity of the point of discharge.

So if we could now look at Slide Number 3.

(Exhibit displayed on screen.)

WITNESS GROVHOUG: And this is a closeup, again showing the SRWTP discharge. It also depicts mixing zones that are currently identified within the NPDES Permit for SRWTP.

And important to note is the human health mixing zone, which is -- which has been determined as a point of complete mix downstream. It's approximately 3 miles downstream from the point of discharge.

And as you can see, the Diversion Structure Number 1 location was actually located within that mixing zone.

Diversion Structure Number 2, which is proposed, is a couple miles -- 1 to 2 miles below that location.

The -- And from -- from this geometry, we really have identified two concerns in my testimony.

The first is: If the WaterFix diversion structures are mischaracterized as drinking water intakes, it could be argued that they are too close to the SRWTP discharge, and that the human health mixing zone may not be allowed.

And, as you know, under that -- The reason that that's important is that the SRWTP for compliance relies on the existence of that mixing zone to be able to operate its coronation facilities which generate THMs.

And so it's reasonably been established that effluent limits, based on the edge of that human health mixing zone, or what we see now in the Permit -- which can be achieved by the EchoWater Project -- in the event that was taken away, it would cause the construction of a new disinfection system, UV and ozonation to replace the chlorine, because the facility could not meet THM discharge limitations in the absence of that mixing zone.

So -- And, as -- as you're well aware, these THMs are within the California Toxics Rule. The State Implementation Plan for the CTR places restrictions on mixing zones within NPDES Permits in the vicinity of drinking water intakes.

So, if -- if -- As I -- I mentioned previously, if the Diversion Structure Number 2 and the other diversion structures were considered in any way to be divert -- drinking water intakes, that would create jeopardy.

Second concern is that the discharge may be

mischaracterized either as raw water augmentation or reservoir water augmentation as recently defined in AB 574.

I'm not advocating that this be characterized in this way, but it is a concern that we have that someone might argue that it should be characterized that way.

AB 574 was signed by the Governor in October of 2017. It amends the Water Code to establish a framework and timeline for adoption of uniform water recycling criteria for direct Potable Reuse Projects.

And it provides the following definitions: That raw water augmentation is the planned placement of recycled water into a system of pipelines or aqueducts that deliver raw water to a Drinking Water Treatment Plant.

Reservoir water augmentation is defined as: Planned placement of recycled water into a raw water reservoir, or into a constructed system conveying water to such a reservoir.

So, those definitions have led to the concern that I've expressed.

The implication is that if the SRWTP discharge was so characterized, either in -- either way, that, although the regulations are not yet final, the best

indication is that full advanced treatment would be required if -- if the discharge was considered in any way to be a -- a potable -- direct potable reuse type Project.

And, as you're well aware, full advanced treatment includes reverse osmosis and advanced oxidation, which -- capital costs of which are in the ballpark of the current EchoWater Project.

So that concludes my testimony.

I -- I believe that Prabhakar will address some possible mitigation for these concerns in his testimony.

WITNESS SOMAVARAPU: Good morning, Chair members.

My name is Prabhakar Somavarapu. I'm the District Engineer or the Chief Executive for the Sacramento Regional County Sanitation District.

The witnesses before me have articulated why restrictions need to be placed, so I just wanted to summarize what restrictions that we're asking for.

As Paul mentioned, that we're not here advocating that this Project not be approved. We're simply advocating that any impacts that may arise out of this Project being in existence should be mitigated so that those costs aren't burdening our rate payers.

The -- The effects come from three things:

One's obviously the operation maintenance, which Reuben had explained.

The second thing comes from the change in the Delta water quality.

When the water is removed ahead of -- as -- before it's going through the Delta, there's going to be some changes in the salinity nutrients, and -- and the -- the corollary impacts that will happen, which will impact us as a discharger for us to continue, which may place more stringent measures on us to continue discharge.

The -- The physical location itself, as Tom just explained, will have an impact, and the characterization of those intakes can have an impact.

So we have kind of 12 actions that we've listed, so I won't go through every one of them, just to simply say that the -- the operating costs and the capital costs should be reimbursed if this were to go forward.

And also a prohibition on the location at least of the -- the first location that they're proposing where the human health zone that Tom just explained why it's an impact to us in terms of the DHM compliance.

Should that intake go there, then it would be an issue for us. So we're asking for a prohibition. At least give us some separation between our intake to their proposed intakes.

And also, the -- the -- Asking them to participate in the stakeholder process that exists today in terms of CV-SALTS, which Regional San is a key member of and has been contributing a fair amount of funding and -- and facilitation resources already, so I think they should join at the table to -- to be a member of that workgroup.

And, then, also Delta Nutrient Research Plan, which, again, Regional San is a big member, in spite of the fact that we're going to be implementing this project of EchoWater and literally taking 95 percent of the ammonia off the system. We are going to continue to be part of that. So we need that participation from them.

So these dozen recommendations that we've laid out in my testimony are essentially the -- what we're asking for your Board to implement based on the impacts that were articulated by my -- the witnesses that preceded me.

That concludes my summary of my testimony.

CO-HEARING OFFICER DODUC: Does that complete

your direct, Mr. Simmons?

MR. SIMMONS: It does. Thank you.

CO-HEARING OFFICER DODUC: All right. If I might ask again for a time estimate from those who would like to cross-examine this panel.

We will start with Miss Ansley and DWR.

MS. ANSLEY: My current estimate is 40 minutes, then -- but depending, of course, on answers.

CO-HEARING OFFICER DODUC: Mr. Herrick.

MR. HERRICK: John Herrick, South Delta parties.

Perhaps 15 minutes.

CO-HEARING OFFICER DODUC: Yesterday, I had more people here who wanted to cross-examine this panel and they are no longer here today, so . . .

All right.

MS. ANSLEY: I'm sorry. I just need a moment to set my materials up.

CO-HEARING OFFICER DODUC: That's fine.

Mr. Herrick?

MR. HERRICK: Because of other legal proceedings, there could be attorneys that come in a little later. I don't know.

CO-HEARING OFFICER DODUC: As soon -- As long as they get here before I dismiss this panel.

MS. ANSLEY: Wait. I have a few less questions now.

Would you like a list of topics?

CO-HEARING OFFICER DODUC: Please.

MS. ANSLEY: For Dr. Paulsen, I plan to ask some questions about the flow science model.

I plan to talk to her then about her -- I believe it's four opinions on residence time, Microcystis, temperature and salinity, with the bulk of it being residence time.

With Mr. -- Is it -- Is it Grovhoug?

WITNESS GROVHOUG: Grovhoug.

MS. ANSLEY: Grovhoug.

WITNESS GROVHOUG: Yes.

MS. ANSLEY: Help me out. Okay.

I have a limited set of questions regarding his -- regarding his regulatory concerns that he just -- I don't plan going off his cross is what I'm saying.

Then I have some questions for Mr. Robles regarding Sac Regional Treatment Plant operations.

And I may -- I may ask a couple of the same questions of -- I'm sorry. Can you pronounce your last name for me one time?

WITNESS SOMAVARAPU: Somavarapu.

MS. ANSLEY: Somarapu (phonetic)?

WITNESS SOMAVARAPU: Close. Somavarapu.

MS. ANSLEY: Somavarapu or -- I need to see it.

WITNESS SOMAVARAPU: Let me turn this.

MS. ANSLEY: And those will be questions on Sac Regional's operations.

CO-HEARING OFFICER DODUC: All right. Please proceed, Miss Ansley.

MS. ANSLEY: I'm going to start with Dr. Paulsen.

CROSS-EXAMINATION BY

MS. ANSLEY: Dr. Paulsen, your testimony is SRCSD-29; is that correct?

WITNESS PAULSEN: Yes.

MS. ANSLEY: And the basis of your opinion's expressed in your Technical Report, SRCSD-31?

WITNESS PAULSEN: Yes.

MS. ANSLEY: And your analyses performed in support of this testimony were performed for WaterFix Project Scenarios B1, B2, H3 and H4?

WITNESS PAULSEN: Yes.

We also evaluated the existing conditions EBC2 and the NAA scenarios.

MS. ANSLEY: But your -- It is my

understanding from reading your Technical Report that your analysis was not performed on the BA H3+ model.

WITNESS PAULSEN: Not for this round, that's correct.

MS. ANSLEY: And is it your understanding here today that the Proposed Action adopted by the DWR is what we call CWF H3+?

WITNESS PAULSEN: I do understand that the Part 2 testimony states that, yes.

MS. ANSLEY: Are you familiar with the Notice of Determination for the Final EIR issued in July of 2017?

WITNESS PAULSEN: I looked at it briefly at the time.

MS. ANSLEY: And before we sort of get into the -- the bulk of the questions, just to confirm that we're on the same page.

And it's your understanding that model run EBC2 was a baseline existing condition modeling run used in the BDCP?

WITNESS PAULSEN: Right. I believe we got those model results in around 2013.

MS. ANSLEY: That would be the date I have for that modeling run.

And, then, is it your understanding that EBC2

was not used in the Final EIR/EIS -- or EIR?

WITNESS PAULSEN: We've discussed that at length in Part 1, yes. EBC1 was used in that and it is our opinion that that wasn't the appropriate model scenario to represent the current existing condition.

MS. ANSLEY: And is it similarly your understanding that EBC2 was not used in the Biological Assessment modeling?

WITNESS PAULSEN: I believe that's the case. I'd have to look back to confirm.

MS. ANSLEY: And I think you clarified earlier.

When you have your analysis of increased diversion events, which by this panel I understand you mean diversion to the emergency storage basin events; is that correct?

WITNESS PAULSEN: Yes. What's the -- I'm sorry. I don't understand the question.

MS. ANSLEY: I believe -- I'm getting to the question.

WITNESS PAULSEN: Okay.

MS. ANSLEY: I believe you testified earlier that your testimony about impacts of the Cal WaterFix to diversion events includes not only reverse flow events but when the ratio of river flow to effluent

discharge is below 14-to-1 -- the ratio of 14-to-1; is that correct?

WITNESS PAULSEN: Right.

We looked at the diversion events that would occur when that ratio fell below 14-to-1 and that includes both reverse flow events and events where the river flow rate dips to a low level but may not actually reverse.

MS. ANSLEY: Thank you. That's the clarification I was seeking, and I believe that was the clarification that your attorney made this morning.

Turning to the -- Your testimony regarding the impacts to Sac Regional's operations rely on a model developed by Flow Science; is that correct?

WITNESS PAULSEN: Yes.

MS. ANSLEY: And this is Appendix A to your Technical Report SRCSD-31; correct?

WITNESS PAULSEN: Yes.

MS. ANSLEY: And is it all right if I refer to it as the ESB model? I believe that's how Flow Science refers to it, but I'm just looking for a way that I can have this conversation with you.

WITNESS PAULSEN: Sure. That's fine.

MS. ANSLEY: If you'd like to check how it's referred to in your report or your test -- or in Flow

Science. I'm just trying to use a consistent term.

WITNESS PAULSEN: No, that's fine as long as we're on the same page.

I mean, their model -- or their -- Excuse me.

Their writeup of it refers to previous ESB modeling. So if you want --

MS. ANSLEY: Okay.

WITNESS PAULSEN: -- to call it the ESB model, that's fine.

MS. ANSLEY: Okay. Is ES -- Is the ESB model a proprietary model?

WITNESS PAULSEN: I don't believe so.

It's a -- Just to clarify what it is: It's a -- It's written in MetLab, and it is just a script, a, you know, computer code that was formulated to describe the operations of the -- or the discharges from the treatment plant to either the river or the ESBs as a function of the river flow rates.

MS. ANSLEY: So this next question may not logically follow from what you're saying, but I'm going to ask it, anyway, and let you explain.

So the -- the model itself that they customized -- the customized MetLab model has not been published.

WITNESS PAULSEN: No. It's a -- It's an

evaluation tool. Essentially, it's just a script that simulates the operations of the discharge and the ESBs on an hourly basis as a function of time.

MS. ANSLEY: Where would I find that script?

WITNESS PAULSEN: I believe the current version of it resides at Flow Science.

MS. ANSLEY: It is not an exhibit to your testimony?

WITNESS PAULSEN: No. We did not attach the model code.

MS. ANSLEY: Where could I find a detailed description of the model, by which I mean the assumptions made regarding Sac Regional's operations?

WITNESS PAULSEN: Many of them are detailed in the appendix.

MS. ANSLEY: Can you point me to a location where there's a chart or a list of modeling assumptions and operations?

WITNESS PAULSEN: Sure.

The model inputs and parameters are described starting on Page 3 of Appendix A.

That describes the effluent flow rates that were evaluated, the monthly influent flows to the plant that were evaluated until the code, the diurnal flow factors that were used in the code. It describes the

14-to-1 trigger ratio. It describes the 2500 cfs floor to the discharge flow rate to the river. It describes the model parameters in Table 3 for diffuser discharge capacity, the influent diversion capacity, et cetera.

MS. ANSLEY: Does this include all the assumptions in the model in the operations of Sac Regional? Do you believe this is a complete list?

WITNESS PAULSEN: I believe that it is the important assumptions that were simulated -- or the important assumptions behind the simulations of the diversions that would be instituted due to the 14-to-1 flow factor.

MS. ANSLEY: Would it be possible to get a copy of the script?

WITNESS PAULSEN: I would have to check.

MS. ANSLEY: But you don't know, sitting here today, whether that would be proprietary or available.

WITNESS PAULSEN: I don't know why it wouldn't be available. It's work product that Regional San paid for.

MS. ANSLEY: So, given that it's a, in your -- in your parlance, a -- an evaluation tool, a customized MetLab model, that model has not been reviewed by anyone else or peer reviewed.

WITNESS PAULSEN: The model was used in --

The -- Let me step back a step and clarify.

I actually developed one of the first versions of that code when I was employed at Flow Science. And we have used versions of that code, it's been updated for EchoWater and other reasons over time.

But I believe the code was first developed in roughly 1999 or 2000 as part of a Master Plan effort by Regional San at that point in time.

There was an independent Technical Review Committee that Regional San convened to look at the modeling that we performed as part of that EIR process. They reviewed this approach in detail as well as all of the other steps that went in that modeling. So I would say that it has been peer reviewed.

MS. ANSLEY: Okay. And can you . . .

Where would I find the results of that independent Technical Review Committee. Would that be in the EIR process that you referenced?

WITNESS PAULSEN: We might want to ask Regional San. I know that it was part of -- part of one of those EIR records.

MS. ANSLEY: Is it under -- Am I correct in understanding that the ESB model uses Freeport flows from DSM-II as an input?

WITNESS PAULSEN: Yes.

MS. ANSLEY: And what is the time step of the Freeport flow used in the ESB model?

WITNESS PAULSEN: The code is set up to use hourly time steps. However, it does interpolate, for example, if you cross between the -- over the 14-to-1 flow ratio inside of an hour, it interpolates that interval on a subhourly basis.

MS. ANSLEY: And I think you testified earlier that the -- the model, as used for the analysis here today, is using solely the 14-to-1 river effluent flow ratio as its factor for determining whether a discharge occurs.

WITNESS PAULSEN: Yes. That is the factor that -- or the -- the set of operational parameters that was evaluated by this code.

MS. ANSLEY: Appendix A appears to have been done in November of 2017.

And, please, obviously feel free to check.

Is there a reason why the BA H3+ wasn't used in this modeling or this analysis?

WITNESS PAULSEN: I -- My memory is that we didn't have access to it until after November 30th, 2017.

Oh, the BA H3+. I apologize.

MS. ANSLEY: That's fine.

WITNESS PAULSEN: I was thinking of the CWF H3+. There are a number of model scenarios.

I believe the CWF H3+ wasn't available until after November 30th.

We were focusing on the WaterFix operational scenarios that were in evidence in this proceeding. I don't know, frankly -- I know that the BA H3+ was not one of the scenarios we evaluated in the Part 1 analyses that we performed.

I guess I'm saying I don't know the answer to that exactly.

MS. ANSLEY: Can you provide the -- Is it -- I assume -- and so I'm asking -- is it possible to acquire the error bands for the four outputs from the ESB model that you referenced in your testimony?

WITNESS PAULSEN: I -- I . . . I'm not sure how to answer that because it is a deterministic model that marks when the river flow rate falls below that 14-to-1 ratio, and accounts on an hourly time step, and subhourly for the beginning and the end of those events, how much water goes into or out of the basins, and it is based upon the river flow.

If we were to do error bands, I think we would probably need error bands around the river flow rate which is not one of the model outputs.

MS. ANSLEY: Well, has the model been calibrated?

WITNESS PAULSEN: Yes.

MS. ANSLEY: And -- And I'm sorry if I asked this already. I'm jumping around a little.

Is there also a Calibration Report?

WITNESS PAULSEN: Well, the DSM-II calibration was performed, I believe, by DWR.

We did also evaluate how the DW -- the DSM-II model output for hourly river flows at Freeport compared to the measured flows. Obviously, not for the simulated scenarios here because those are hypothetical scenarios, but for actual historical time periods.

MS. ANSLEY: So the -- the ESB model utilizes monthly scale influent flows; correct?

WITNESS PAULSEN: Yes.

MS. ANSLEY: Does it assume the influent value stay constant every day of the month?

WITNESS PAULSEN: Within a given month and within a given scenario, yes.

There are diurnal flow factors so that the hourly values do vary around a central value, but around the same monthly value for a given month within the simulation, yes.

MS. ANSLEY: Do you know if Sac Regional

Operators have some flexibility to adjust daily influent inflows into the treatment plant in response to river flows?

WITNESS PAULSEN: If the Operators can adjust influent flows? Is that your question?

MS. ANSLEY: Yes.

If there's, like -- Is there storage basins for holding inflows in addition to storage basins for holding -- the Emergency Storage Basins for --

WITNESS PAULSEN: I see.

MS. ANSLEY: I guess D would be for treated water.

So is there -- is there a way to regulate inflow into the Treatment Plant?

WITNESS PAULSEN: I would actually ask that question of Mr. Robles.

WITNESS ROBLES: We have the ability to divert -- Let me tell you how we divert to ESB A, B, C and D.

When our inflow rates are very high during peak weather events, anything above roughly 300 million gallons of water per day, roughly, we divert to ESB-A and they overflow into B, C, and D -- I'm sorry -- B and C.

Now, your question was, can we divert for

river conditions?

For what I'm describing, we typically -- That's not the reason we divert, what I'm describing. We divert for peak flows, and we can convert primary influent into A or primary effluent into A and then they would overflow into the subsequent basins.

MS. ANSLEY: So the Operators do not -- do not adjust daily influent flows into the treatment plant in response to river flows. That's not a --

WITNESS ROBLES: Indirectly.

MS. ANSLEY: -- an operational parameter you look at to regulate inflow.

WITNESS ROBLES: We do indirectly, because if the river flows are not at that 14-to-1 ratio, then we divert.

So, the answer is, yes, we divert if the river flows' too low relative to our effluent flow and that it doesn't meet the 14-to-1, we do divert to D.

Now, we have flow monitoring on the river and then we have, obviously, our own flowmeters. So we do track that. We have to. That's part of our permit requirement.

MS. ANSLEY: So -- And just to make sure I'm clear, and it's probably just to clarify something for me.

So does the ESB modeling adjust flows into the influent basin as well as -- I guess what it would be is ESB-D, the effluent basin. The ESB modeling's taking into account all of that operational flexibility; is that correct?

WITNESS PAULSEN: The modeling takes account of the water that is coming out of the treatment plant as treated effluent and whether that can be discharged to the river or not.

It does not look at modifications to operations on the influent side.

MS. ANSLEY: Do the Sac Regional Operators have some flexibility to adjust the hourly flow rates in response to river flow and tides?

WITNESS ROBLES: Let me turn this over to Mike Melady.

A little quick introduction: So Mike Melady is our Chief Plan Operator. He's a certified State of California Operator. He's in charge of all of our operation staff and responsible for the day-to-day operations of the treatment plant. So he's the best person to answer these -- these type of questions.

Mike?

WITNESS MELADY: Can you repeat the question.

MS. ANSLEY: Yes.

Do Sac Regional Operators have some flexibility to adjust the hourly flow rates in response to river flows and tides?

WITNESS MELADY: Not with respect to the influent flow. We do not have any means to store the influent flow in an equalization basis.

Our flow go up and down throughout the day significantly with some variance.

MS. ANSLEY: We would like to request that, for purposes of rebuttal, that we can get a copy of the -- I hope I'm using the correct terminology -- the script used to model Sac Regional operations as well as any peer-reviewed -- any validation or independent review of that model so that we can . . . better assess this model. That would be our request to the attorney Mr. Simmons.

CO-HEARING OFFICER DODUC: Any objections, Mr. Simmons?

MR. SIMMONS: No. I will -- I will be in touch with Flow Science about that request.

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

MS. ANSLEY: Thank you.

Can we call up SRCSD-31.

(Exhibit displayed on screen.)

MS. ANSLEY: Which is Dr. Paulsen's Technical Report.

And can we go to -- I believe it's .pdf Page 28.

(Exhibit displayed on screen.)

MS. ANSLEY: Which should show us Table 6. No.

Would it be Page 21 to 20 -- Oh, please go down one more.

(Exhibit displayed on screen.)

MS. ANSLEY: Thank you.

This is the Table 6 from your Technical Report; is that correct, Dr. Paulsen?

WITNESS PAULSEN: Yes.

MS. ANSLEY: And this is the table that you essentially walked us through as the basis for your Opinion Number 4 on impacts to Sac Regional's operations; is that correct?

WITNESS PAULSEN: Yes.

MS. ANSLEY: Looking at parameter number (2), and looking at the NAA and the WaterFix scenarios that you modeled, doesn't this show that the percent of time the diversions of effluent storage is required differs by a maximum of 1 percent in your analysis?

WITNESS PAULSEN: If you would calculate that

by subtracting the -- Well, no. I would say, no, it doesn't differ by 1 percent. I can see how you can calculate that. If you take the percent of time that diversion is required for H4, that's 9 percent.

MS. ANSLEY: Um-hmm.

WITNESS PAULSEN: And the percent of time for the NAA is 8 percent.

If you subtract the two, that is a difference of 1 percent.

But if you look at the numbers, the percent increase of H4 relative to the NAA, that's a 13 percent increase in the percent of time the diversions would be required.

MS. ANSLEY: In a sense, because that would be 1 percent of the time over -- over eight or nine, which is 13 percent; correct?

WITNESS PAULSEN: Nine is about 13 percent greater than eight.

MS. ANSLEY: Right.

So, speaking in absolute time -- So I think we're speaking -- The two rows would be absolute and relative difference; is that correct?

So, 8 percent of the time under the NAA, diversion is required under your analysis, and 9 percent of the time under the H4, diversion is

required under your analysis.

Did I say that correctly?

WITNESS PAULSEN: I think so.

MS. ANSLEY: And then looking at your Result Number (3), just to -- Oh. I want the header still.

(Exhibit displayed on screen.)

MS. ANSLEY: Thank you.

So, again, looking at sort of the percent of time the effluent's stored in the Emergency Storage Basins, ESBs, in your analysis -- Under the NAA, your analysis shows 16.4 percent of the time and your H4 is 18.4 percent of the time.

WITNESS PAULSEN: Correct.

MS. ANSLEY: It appears speak -- looking at your chart as a whole -- that the differences between the NAA and the WaterFix scenarios, the relative differences or, if you want, you know, whichever parameter you want to look at in whichever row, are less than the comparison with the EBC2 Existing Condition Scenario that you utilized; is that correct?

WITNESS PAULSEN: Yes.

MS. ANSLEY: I'd like to move on to your calculations of residence time.

Hold on.

Pardon me. I'm making sure I have the correct

page number.

Can we look at Page 10 of this report, which may be .pdf 16 or 17.

(Exhibit displayed on screen.)

MS. ANSLEY: There we go.

And I believe that you stated this earlier, but just to confirm:

These are the same modeling results that you presented in Part 1 on behalf of City of Stockton; is that correct?

WITNESS PAULSEN: They were presented previously. I just correct that by saying this isn't -- this isn't our modeling results. These are based on the DSM-II model runs that were performed by DWR. So just to be really clear.

MS. ANSLEY: But you calculated residence time by dividing the estimated total volume of water in the Delta by the total estimated inflows for each month; is that correct?

WITNESS PAULSEN: Yes, where the inflows were taken directly from the DSM-II model runs, yes.

MS. ANSLEY: I -- I understand what you're saying, so -- but this table is a reflection of your results from doing that calculation; is that correct?

WITNESS PAULSEN: Yes. I mean, my -- The only

quibble I have with the original question that you asked, is, I wouldn't consider that calculation to be a model.

It's a --

MS. ANSLEY: That's fine.

WITNESS PAULSEN: -- simple calculation.

MS. ANSLEY: I'm willing to accept that. However you'd like to characterize it is fine.

Under your approach, doesn't your residence time analysis -- is "analysis" fine? Does your residence time analysis assume the Delta is a constant volume?

WITNESS PAULSEN: Well, it's looking at the average volume over time. The volume will go up and will go down in a single tidal cycle, with every tidal cycle.

But it is estimating the total volume of water in the Delta as a long-term average.

MS. ANSLEY: But does total volume of water -- I understand how the inflows will vary and how you got the inflows.

Does your total volume of water in the Delta also vary in your calculation? I guess that would be your numerator?

WITNESS PAULSEN: No, and I don't see any

reason that it should.

MS. ANSLEY: And that was -- The volume was 1.2 million acre-feet.

Is that your calculation?

WITNESS PAULSEN: Yes, that's the -- the estimated volume.

MS. ANSLEY: So your -- your computation or your analysis is the amount of time it takes for 1.2 million acre-feet to be filled for a given inflow.

WITNESS PAULSEN: No, I wouldn't characterize it quite that way.

I would say that the Delta has an average volume of about 1.2 million acre-feet, and this looks at how long it would take to -- essentially to replace that volume given a certain inflow volume.

These are relative calculations, you know, estimates made using that volume and the volume of the inflows for a given month.

MS. ANSLEY: And . . .

So the analysis does not measure the time that a specific molecule of water resides in the Delta.

WITNESS PAULSEN: It is an estimate of the average value of time that a molecule of water would be in the Delta.

MS. ANSLEY: It -- It is not like a -- it does

not track a particle. It's not a particle tracking model; is it?

WITNESS PAULSEN: We did not do this analysis this way.

But if you went back to the exhibit -- I believe it's in Stockton-026 -- we do discuss DWR's analysis of particle tracking model runs used to evaluate residence time and sort of compare or, you know, ground truth these analyses with that.

The purpose of this analysis was to show the change in residence time that we anticipated.

MS. ANSLEY: Does your analysis assume that the hydrodynamic characteristics are uniform throughout the Delta, the way you've done it here?

WITNESS PAULSEN: Well, we all know that the - You know, depending upon where a molecule of water will enter the Delta, that will change, the path that it will take to leave the Delta and probably how long it takes to do that.

So these, again, are general comparative estimates of the residence time of water in the Delta. If you were to release a molecule of water at -- I don't know -- at Antioch, it would have a much shorter residence time than water that entered the Delta, say, from the San Joaquin River at Vernalis.

This is an estimate of the mean residence time of water in the Delta.

MS. ANSLEY: Isn't it important in the Delta to account for high turbulence that occurs as part of the natural tidal volume?

WITNESS PAULSEN: I do not understand that question.

MS. ANSLEY: Does your analysis account for differences in tides?

WITNESS PAULSEN: Yes.

MS. ANSLEY: And how does it do that?

WITNESS PAULSEN: By looking at the long-term average residence time.

MS. ANSLEY: Isn't this type of analysis more appropriate for lentic systems, typically lakes and reservoirs?

WITNESS PAULSEN: In my opinion, this is an appropriate method for determining the average residence time of water in the Delta and for comparing the residence time under one scenario to the residence time under another scenario.

MS. ANSLEY: In your discussion on Microcystis -- I think it's on Page 12 of SRCSD-31. I'm trying to keep the two documents you have straight.

You know that the direct effect of increased

residence time would be a decrease in Delta flushing; correct?

WITNESS PAULSEN: In some portions of the Delta, yes.

MS. ANSLEY: Is the time period for the flushing period you're describing on a tidal sale or a seasonal scale?

WITNESS PAULSEN: I don't think I understand the question.

MS. ANSLEY: Is the flushing process you're talking about overall, is it on a scale of a -- is it incor -- are you speaking of both a tidal scale which would be more of a daily occurrence or a short-term occurrence versus a seasonal flushing, maybe like wet winter flows or something like that.

Do you have -- What did you mean by the term "flushing process" in terms of the temporal scale?

WITNESS PAULSEN: The residence time is one measure that you can use to estimate the flushing of water out of the Delta. And those residence times are on the order of 20 to -- 20 or 24 to 30 or almost 40 days.

So we're looking at the average residence time or the flushing time over the -- a period of roughly a month.

MS. ANSLEY: Okay.

WITNESS PAULSEN: And there will be a range of both spring and neap tidal conditions and flood and ebb tides and water will slosh around in the interior of the Delta over those time-scales.

MS. ANSLEY: A 30-day time-scale.

WITNESS PAULSEN: Roughly. I mean, the -- the time-scales that we were looking at in the prior table.

MS. ANSLEY: So when you referred to the flushing process, were you thinking of your analysis on a -- on a -- looking at approximately a monthly time-scale?

WITNESS PAULSEN: Yes. Again, that is an estimate of the average residence time of water within the Delta as a whole. The residence time of water at any particular location may differ.

MS. ANSLEY: Can we look again at your Table 1. I don't know if it's simply the next page. It's Page 10 of your SRCSD-30.

(Exhibit displayed on screen.)

MS. ANSLEY: Thank you.

Here you show results for Alt 4A; is that correct?

WITNESS PAULSEN: Yes.

MS. ANSLEY: Were you averaging together the

monthly results for H3 and H4?

WITNESS PAULSEN: I would have to go back to Stockton-26 and take a look at that to determine.

I know that we intended H4 -- sorry -- Alt 4A to be representative of H3 and H4 in aggregate.

MS. ANSLEY: But as you sit here today, you don't know what that Alt 4A is, either H3 or H4 or an average of H3 and H4.

WITNESS PAULSEN: I don't remember exactly how we arrived at those numbers, but I know that they were intended to be a -- a blend of H3 and H4.

I'd have to look back at the original to refresh my memory as to how we calculated that.

MS. ANSLEY: So your Opinion 1 that WaterFix will increase residence time -- My understanding from your discussion of this is a way to estimate comparisons of average residence time, is that your Opinion 1 is -- that there will be an increase in residence time in the Delta but not for any particular location in the Delta; is that correct?

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

The estimates of residence time are the average residence time for the Delta as a whole.

MS. ANSLEY: Thank you.

Just a -- Let's . . .

Now, looking again at this table, this is for -- If you look at the title of the table, it says (reading):

". . . Residence times of inflows to the Delta under a dry water year."

And our question really is simply: Is this table for a 16-year period -- all dry years in the 16-year period or did you choose a relative year.

WITNESS PAULSEN: I believe these are average results for the dry water years within the 16-year period. We can look back at Stockton-36 to confirm.

MS. ANSLEY: And these results came from your analysis in Stockton-26, Appendix F, which was your results of your residence time analysis there.

Do you re -- Is that correct?

WITNESS PAULSEN: I don't remember which appendix it was in.

MS. ANSLEY: Do you recall whether the results for these same -- these same results in a critical -- for critical years were actually smaller residence times?

WITNESS PAULSEN: Again, we could pull up Stockton-26 and look at the -- the numbers. I haven't looked at the detail of that calculation in several

months.

MS. ANSLEY: Is there a reason why you, then, chose just the dry water year as opposed to presenting the results --

MR. SIMMONS: Chair Doduc: I think we're having Part 1 cross-examination now involving another Protestant.

MS. ANSLEY: She is presenting --

CO-HEARING OFFICER DODUC: It's --

MS. ANSLEY: -- the same testimony in Part 2 --

CO-HEARING OFFICER DODUC: It's a fair question. Overruled.

Do you need the question repeated, Dr. Paulsen?

WITNESS PAULSEN: I think I remember it.

My memory is that, in Stockton-26, we presented results for all of the different water year types, combining above normal and below normal into one --

MS. ANSLEY: Yes.

WITNESS PAULSEN: -- quote-unquote normal category, but that we used the dry water year results within the body of the report as examples of the impacts.

But, again, the information for other water years is, as I recall, in the original exhibit.

MS. ANSLEY: But you chose here to present the dry water year results as opposed to the results of other water year types.

WITNESS PAULSEN: We pulled this table consistent with what we had done in Stockton-26, so, yes, that's correct.

MS. ANSLEY: You provided an opinion on temperature increases in the Delta as a result of increased residence time; is that correct?

WITNESS PAULSEN: Yes.

MS. ANSLEY: Did you do or direct any analysis of CWF impacts on temperatures yourself?

WITNESS PAULSEN: We reviewed the temperature impacts that were presented. I believe that information is, again, also in one of the Stockton reports.

We used the results that had been presented here in Part 1.

MS. ANSLEY: I think my question was more just to make sure that you have not yourself conducted any temperature modeling to determine impacts of the California WaterFix on temperatures in the Delta.

I understand that you reviewed our temperature

modeling. I'm just trying to confirm the extent of what analyses you did independently.

WITNESS PAULSEN: We did not model temperature.

CO-HEARING OFFICER DODUC: While Miss Ansley is reviewing her question, let me check with the court reporter.

You doing okay?

THE REPORTER: (Nodding head.)

CO-HEARING OFFICER DODUC: All right. We'll take a break after Miss Ansley completes her cross-examination.

MS. ANSLEY: On Page 13 of your Technical Report, and so can we scroll down just a couple pages.

(Exhibit displayed on screen.)

MS. ANSLEY: You note as an example DWR-653, and you note that a -- there would be a model simulation projected increase of .1 degrees centigrade at Prisoners Point.

Do you see that testimony?

WITNESS PAULSEN: Yes.

And, to be clear, it's a quotation out of a DWR exhibit.

MS. ANSLEY: Yes. I checked the quotation because there is an ellipsis in the middle.

Did you . . . And you also note the .3-degree centigrade and you used this as part of your basis that there will be significant impacts or changes in water temperature in the Delta as a result of Cal WaterFix; is that correct?

WITNESS PAULSEN: We presented that, I believe, again, within the Stockton exhibit originally as an example of DWR's presentation of temperature results as a 16-year average that showed that the temperature would increase.

In some months -- Because this is an average over a 16-year period, in some months, the temperature increases will be larger than this. So that was why we presented this information.

MS. ANSLEY: Okay. And you present it here again, which is why I'm -- I'm asking.

Based on your understanding of DSM-II, would a .1 degree centigrade increase be within the error bars of the temperature modeling?

WITNESS PAULSEN: I don't know.

MS. ANSLEY: How about .3?

WITNESS PAULSEN: I don't know. I haven't reviewed the error bars of the temperature modeling.

I don't recall that that information was presented in the DWR exhibits. I -- I could be wrong

about that.

MS. ANSLEY: Do you recall that the sentence that you left out of the quote here concluded that the frequency with which any given temperature would be above 19 degrees C would be similar between the CWF and the NAA?

WITNESS PAULSEN: I don't recall that, but it -- it wouldn't surprise me, again, as a 16-year average.

MS. ANSLEY: Moving on to your testimony regarding Microcystis.

Do you agree that there are multiple environmental conditions that must occur before Microcystis will form harmful algal blooms?

WITNESS PAULSEN: Yes.

MS. ANSLEY: Are you familiar with the work of Peggy Lehman on Microcystis in the Delta.

WITNESS PAULSEN: I have reviewed it.

MS. ANSLEY: Do you agree with her statement in her 2013 paper that (reading):

". . . Factors associated with the abundance and distribution of Microcystis blooms since their inception" in the Delta "in 1999 are poorly understood."

MR. SIMMONS: Chair Doduc, I'll object to the

question. There was a question of whether Dr. Paulsen is familiar with the work of another --

MS. ANSLEY: No. I asked her if she agreed with that statement since she is familiar with the work.

MR. SIMMONS: Yeah. So we're -- we're -- If you could give her the report to look at the context for the statement.

MS. ANSLEY: Sure. If she -- If she needs the --

CO-HEARING OFFICER DODUC: Do you need it, Dr. Paulsen?

WITNESS PAULSEN: Could you repeat the question that you originally asked --

MS. ANSLEY: Sure.

WITNESS PAULSEN: -- and let me think about that.

MS. ANSLEY: And I can -- I'll try and shorten it.

Do you agree with Dr. Lehman's statement that the (reading):

". . . Factors associated with abundance and distribution of Microcystis blooms are poorly understood in the Delta."

WITNESS PAULSEN: I do disagree to some

extent. It's very clear that residence time and temperature are associated with an increased likelihood of Microcystis blooms. I think that is well understood.

MS. ANSLEY: Are you aware of any studies that have directly measured the relationship between residence time changes and Microcystis growth?

WITNESS PAULSEN: A number of the studies have looked at the relationship between the two.

One of the factors that's important in Microcystis bloom formation and persistence and growth is how long the organisms are present within the system. And the longer they're present, the greater the likelihood of a bloom or of a persistent bloom and that's a direct relationship with residence time.

MS. ANSLEY: Are you speaking of Dr. Lehman's work in 2013?

WITNESS PAULSEN: I -- Honestly, I can't remember sitting here exactly which it is but it is one of the exhibits that we submitted with the Stockton report.

MS. ANSLEY: And by "relationship," I don't mean correlation analysis. I mean, has someone done a study that develops the relationship that would let us know how many days of increased residence time would

lead to a longer or more exacerbated bloom formation?

So perhaps I spoke too generally when I said a "relationship." I didn't mean a correlation.

Has anyone -- Are you aware of any studies that directly determine a relationship between residence time changes and Microcystis growth?

WITNESS PAULSEN: I believe that at least two of the studies that we evaluated looked at the relationship between residence time and Microcystis growth.

I would have to review those studies to be able to talk about the -- the detailed analysis that they performed in order to arrive at that conclusion.

MS. ANSLEY: And which studies are those?

WITNESS PAULSEN: They were submitted as exhibits to the Stockton testimony.

And I believe that they were also footnoted within that Stockton report.

MS. ANSLEY: But, as you sit here today, you can't tell me the names of those studies.

WITNESS PAULSEN: I don't want to guess wrong. But they are in the exhibits that we submitted as part of the Stockton testimony.

(Timer rings.)

CO-HEARING OFFICER DODUC: How much more time

do you anticipate needing?

MS. ANSLEY: I am down to my last couple questions for Dr. Paulsen, but I do believe that I will need . . . 20 -- at least 20 minutes to clean up my couple questions for each of the remaining witnesses.

CO-HEARING OFFICER DODUC: Why don't you finish your question with Dr. Paulsen. We will take a break.

MS. ANSLEY: That would be fine. Thank you.

In your testimony, your third opinion concerns salinity impacts; is that correct?

WITNESS PAULSEN: Yes.

MS. ANSLEY: And more specifically, chloride concentrations, I believe.

WITNESS PAULSEN: As one measure of salinity, yes.

MS. ANSLEY: And you note that it's expected to increase at Antioch and Brentwood downstream of the Sac Regional discharge point; correct?

WITNESS PAULSEN: The information that we presented in this report looks at salinity. I think we focused mainly on Antioch and at Pumping Plant 1, which is where Brentwood diverts water, looking at the EBC2, NAA and Boundary 1 scenarios.

MS. ANSLEY: And that was my next question

was: Your -- That analysis was between B1, NAA and EBC2; is that -- That's what you just said?

WITNESS PAULSEN: Right.

Again, in the material we presented for Antioch and for Brentwood, we looked at all of the different scenarios. Boundary 1 was the one that had the highest increase in salinity and that is the one that we presented here.

MS. ANSLEY: Does your testimony here today provide any analysis of salinity impacts at Sac Regional's -- I guess I'll call it discharge point? Their diffuser location.

WITNESS PAULSEN: Can I ask you to clarify that question? Do you mean the river salinity?

MS. ANSLEY: Sure.

So you have testimony that concerns CWF impacts on salinity.

And my understanding is, those impacts are -- what you would expect to see an increase or they're performed, for Antioch -- and I don't remember what you called -- Diversion 1 for Brentwood, but --

WITNESS PAULSEN: Pumping Plant 1 --

MS. ANSLEY: Pumping Plant 1?

WITNESS PAULSEN: -- approximately.

MS. ANSLEY: So my question is: Is there

another location that you reviewed or performed an impact analysis for salinity and, specifically, was there an analysis of salinity changes due to the WaterFix at Sac Regional's discharge point?

WITNESS PAULSEN: We did not do that, but my understanding is that the DWR model runs, the DSM-II model runs, that we used to characterize salinity within the Delta assumed the same salinity for the Sacramento River in the NAA as they did for the Project scenarios.

MS. ANSLEY: To your knowledge, do Sac Regional effluent discharges contribute to mass loading of salinity at Antioch and Brentwood?

WITNESS PAULSEN: Certainly, the region -- the Sac Regional or the Regional San discharges have a higher salinity than the Sacramento River water into which they discharge.

They do contribute some small amount to salinity within the Delta. We've previously evaluated that as part of the EIR analyses for the -- the Regional San EIRs related to the Wastewater Treatment Plant in the past.

MS. ANSLEY: I believe that's all my questions for Dr. Paulsen.

CO-HEARING OFFICER DODUC: Thank you.

We will take a break and return at 11:25.

(Recess taken at 11:10 a.m.)

(Proceedings resumed at 11:25 a.m.:)

CO-HEARING OFFICER DODUC: All right. Please take a seat, everybody, and we will resume.

Miss Ansley.

MS. ANSLEY: I'm madly throwing out questions so I think it'll go fast.

CO-HEARING OFFICER DODUC: You know, there are probably a few attorneys here or not here sort of, you know, rooting for you to continue.

MS. ANSLEY: So these questions are for Mr. Robles.

Mr. Robles, isn't it true -- isn't it true that Sac Regional is the largest wastewater discharger to the Delta?

WITNESS ROBLES: Yes.

MS. ANSLEY: Isn't it true that Sac Regional's wastewater discharges constitute approximately 60 percent of all permitted discharges into the Delta?

WITNESS ROBLES: I don't know the percentage offhand.

MS. ANSLEY: Can we call up from the thumb drive, let's see, the 2009 Permit Renewal Issues.

(Exhibit displayed on screen.)

MS. ANSLEY: This is just an excerpt.

Do you recognize this document? I believe it's a staff report of some sort from the Central Valley Regional Water Quality Control Board.

WITNESS ROBLES: Is that a Regional San document?

MS. ANSLEY: I -- No. I believe this is from the Central Valley Regional Water Quality Control Board.

WITNESS ROBLES: Okay. Yes, it looks familiar.

MS. ANSLEY: Can you go to the next page. This is an excerpt so it should be just the next page.

(Exhibit displayed on screen.)

MS. ANSLEY: And blow up that figure.

(Exhibit displayed on screen.)

MS. ANSLEY: Do you recognize this figure?

WITNESS ROBLES: Yes.

MS. ANSLEY: Does this refresh your recollection that the wastewater discharges from Regional San constitute approximately 60 percent of --

MR. SIMMONS: Chair Doduc, I'll object on relevance grounds.

I think it's widely known that most people in the Central Valley live in the Sacramento Region and

that tends to be reflected in the percent of wastewater discharge.

There's -- It is nothing that's relevant to WaterFix or the protest of WaterFix and the percent of people that live in the Sacramento Region.

CO-HEARING OFFICER DODUC: Miss Ansley.

MS. ANSLEY: I am laying the foundation. They bring at issue here Sac Regional's operations and they also --

(Alarm sounds.)

MS. ANSLEY: What's . . .

CO-HEARING OFFICER DODUC: Hold on.

CO-HEARING OFFICER MARCUS: That's an alert.

CO-HEARING OFFICER DODUC: I don't know if it's on our floor.

CO-HEARING OFFICER MARCUS: There will be an announcement.

CO-HEARING OFFICE DODUC: There will be an announcement. Hold on.

CO-HEARING OFFICER MARCUS: I just want to see all those orange people.

CO-HEARING OFFICE DODUC: I know.

CO-HEARING OFFICER MARCUS: They could be testing it. It's a Friday, so . . .

CO-HEARING OFFICER DODUC: I think we might

have to evacuate. That sounds awfully close. Okay.

UNIDENTIFIED SPEAKER: Automatic doors are closed outside.

CO-HEARING OFFICE DODUC: Oh, really?

(Whereupon, a discussion was held off the record commencing at 11:26 a.m.)

(Proceedings resumed at 11:27 a.m.:)

BUILDING ANNOUNCEMENT: Attention all building occupants. Attention all building occupants.

An alarm has sounded on Floors 24, 23, 22.

We are in the process of investigating the alarm at Floors 23, 22 and 24.

Please continue with your relocation procedures. All other floors, please wait for an upcoming announcement.

I repeat: Attention all building occupants.

An alarm has sounded on Floors 22, 23, 24.

We are in the process of investigating the alarm at Floors 22, 23, 24.

Please continue with your relocation procedures. All other floors, please wait for an upcoming announcement.

CO-HEARING OFFICER DODUC: All right. Let's --

CO-HEARING OFFICER MARCUS: Let's take a

break.

CO-HEARING OFFICER DODUC: Let's take a break.

(Recess taken at 11:28 a.m.)

(Proceedings resumed at 11:30 a.m.:)

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

MS. ANSLEY: We are? Okay.

CO-HEARING OFFICER DODUC: Yes. We're not on the three floors that are affected.

So now I need to -- We need to check. The door's closed. Are people not able to leave?

MR. HERRICK: There's a divider there so we can't get to the stairway.

CO-HEARING OFFICER DODUC: We need to find out what the correct exit route is so we can evacuate.

Okay. Lesson's learned.

All right. Miss Ansley?

MS. ANSLEY: Yeah.

CO-HEARING OFFICER DODUC: That was exciting.

Start to resuming your cross-examination.

Objection overruled.

You may continue asking your question, Miss Ansley.

MS. ANSLEY: I really didn't have a followup question.

My question just was: Does this refresh your recollection that the Sac Regional discharges are approximately 60 percent?

WITNESS ROBLES: The relative proportion of our effluent to the rest looks about right. I can't attest to exact percentage but we are the biggest discharger in the river.

MS. ANSLEY: Okay. And on Pages 8 and 9 of your testimony, you state concerns with the potential for increased reverse flow events under the Cal WaterFix.

Is that generally correct?

WITNESS ROBLES: That's right, based on the modeling from Dr. Paulsen.

MS. ANSLEY: Isn't it true that, in the FEIR, DWR committed to develop operational protocols in consultation with Sac Regional to ensure that there would be no increased reverse flow events?

WITNESS ROBLES: Those type of questions will need to be answered by someone else on our team. I'm not intimately involved in the WaterFix analysis or reviews.

MS. ANSLEY: That's fine. I apologize if --

MR. SIMMONS: And I would object to the question, too, because the EIR's not the relevant

document. It's the -- It's the decision document made by DWR and whether it made any commitments.

MS. ANSLEY: Okay. My question is: Isn't it true that, in the FEIR, which would be the Final EIR adopted by DWR, didn't DWR commit to develop operational protocols in consultation with Sac Regional to ensure there would be no increased reverse flow events such that Regional San operations would remain consistent with facility storage capabilities?

And I do not mind if any of the Operators would like to --

CO-HEARING OFFICER DODUC: Objection overruled.

But is anyone able to answer?

WITNESS PAULSEN: Yes.

CO-HEARING OFFICER DODUC: Dr. Paulsen.

WITNESS PAULSEN: We submitted materials in this. Specifically, there was a letter that we wrote in January 2017 where we looked at that commitment and evaluated that commitment and concluded that we didn't understand how changes in operations at the diversion structures could or would impact reverse flows because reverse flows are a complex function of reservoir releases and river flows and -- and other factors.

I -- I could go into greater detail.

MS. ANSLEY: No. Actually, my question was, and maybe you're answering it on behalf of Sac Regional now, is: Isn't it true that the FEIR -- in the FEIR, that DWR made that commitment?

Is that what you're affirming, that you are aware of that commitment?

MR. SIMMONS: Chair Doduc, the document speaks for itself and people are being asked about a commitment in the Final EIR that none of us have in front of us.

CO-HEARING OFFICER DODUC: Mr. Simmons, to the extent that they are familiar enough to answer, they should.

And I believe Dr. Paulsen provided an answer, Miss Ansley.

MS. ANSLEY: And I'm happy to move on.

CO-HEARING OFFICER DODUC: Let's move on.

MS. ANSLEY: Okay. My final questions are for Mr. -- Is it Grovhoug?

WITNESS GROVHOUG: Yes.

MS. ANSLEY: Grovhoug. Okay.

WITNESS GROVHOUG: Yes.

MS. ANSLEY: Let me turn to your -- You have a -- Your errata testimony is -- Or your recent testimony is 37; is that correct?

WITNESS GROVHOUG: That's correct.

MS. ANSLEY: And can we call up SRCSD-37, please.

(Exhibit displayed on screen.)

MS. ANSLEY: Can we go to Opinion 1 on Page 4 at Lines 14.

(Exhibit displayed on screen.)

MS. ANSLEY: Do you see that there, sir? Do you have it in front of you?

WITNESS GROVHOUG: I do.

MS. ANSLEY: Can we look at Lines 17 through 19 as well.

And here, you state that it's your opinion that implementation of the California WaterFix will result in increased advocacy for regulatory changes in the future; is that correct?

WITNESS GROVHOUG: Yes.

MS. ANSLEY: So you are not talking in Opinion 1 about impacts from the California WaterFix under current -- currently known regulatory requirements or conditions; is that correct?

WITNESS GROVHOUG: I think I'm -- As I stated in my oral today, there's a concern that the location and operation of the WaterFix diversion structures will impact future NPDES determinations.

MS. ANSLEY: So is that a "yes" to my question, that your -- your opinion is not regarding impacts from the California WaterFix under currently known regulatory requirements or conditions; correct?

MR. SIMMONS: Objection: That misstates the opinion as written.

MS. ANSLEY: I'm just trying to make sure I --

MR. SIMMONS: This -- This relates to -- He testified about arguments that it would be characterized as a drinking water intake, existing law, the State Implementation Policy.

He testified that it pertains to raw water augmentation --

MS. ANSLEY: I object to him --

CO-HEARING OFFICER DODUC: Mr. Simmons, enough. Enough.

MR. SIMMONS: I'm just saying --

CO-HEARING OFFICE DODUC: Miss Ansley asked a very direct question, and if it is indeed a misstatement, then the witness may correct her.

Miss Ansley.

MS. ANSLEY: In your Opinion 1 about significant regulatory impacts, you are not talking about impacts from the California WaterFix under currently known regulatory requirements or conditions;

is that correct?

WITNESS GROVHOUG: I would not agree with that.

MS. ANSLEY: Okay. And how would you not agree with that?

WITNESS GROVHOUG: Well, as I've cited, I'm -- The concern that I've raised in Opinion 1 is really with regard to regulatory requirements that are on the books today. And it's the interpretation of those current regulatory requirements in the future with the proposed diversion structures at the locations proposed that is the basis for the concern I've registered.

MS. ANSLEY: And these are determinations in the future; correct?

WITNESS GROVHOUG: Yes.

MS. ANSLEY: And these would include . . .

These include whether the discharges from the Sac Regional were ever to be determined a raw water augmentation or reservoir water augmentation -- is that correct? -- under the current Water Code changes by AB 574?

WITNESS GROVHOUG: That's one of the concerns.

MS. ANSLEY: And have they been determined to be raw water augmentation or reservoir water augmentation?

WITNESS GROVHOUG: Not currently.
MS. ANSLEY: And -- Let's see.
And you also provide testimony on concerns regarding THM effluent limitations?
WITNESS GROVHOUG: That's correct.
MS. ANSLEY: And your worry is that the current dilution credit would be eliminated?
WITNESS GROVHOUG: That's correct.
MS. ANSLEY: But this is something that has not occurred yet; is that correct?
WITNESS GROVHOUG: That's correct.
MS. ANSLEY: Will these changes or future regulatory processes that you speak about here, would they require future proceedings and hearings?
WITNESS GROVHOUG: Yes.
MS. ANSLEY: On Page 4, Line 20 to 24 -- 23 to 24 --
(Exhibit displayed on screen)
MS. ANSLEY: -- you provide a definition of "drinking water intake."
Is this your personal definition of drinking water intake in your opinion?
WITNESS GROVHOUG: Yes.
MS. ANSLEY: Turning to your second opinion, which starts on Page 8.

(Exhibit displayed on screen.)

MS. ANSLEY: You profess an opinion that water quality degradation due to the WaterFix may lead to more restricted NPDES Permit requirements; correct?

WITNESS GROVHOUG: That's correct.

MS. ANSLEY: And your concerns regarding electrical conductivity are based on a not-yet-adopted TMDL; is that correct?

WITNESS GROVHOUG: That's correct.

MS. ANSLEY: And, again, a -- an adoption of a TMDL would require a -- a regulatory proceeding and hearing; is that correct?

WITNESS GROVHOUG: That's correct.

MS. ANSLEY: I think that's all my questions.

Thank you.

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

MS. ANSLEY: Oh, the alarm stopped.

CO-HEARING OFFICER DODUC: Yes. Just as my noise annoyance level reached its threshold.

MR. HERRICK: Ironic with me next.

(Laughter.)

MS. ANSLEY: I'll go pull it again.

MR. HERRICK: Thank you, Chair, Board Members.

John Herrick for the South Delta parties.

I don't have too many questions. I have a few for Dr. Paulsen with regards to her analysis on effects of water quality.

And then I have one or two for Mr. Robles, and that may be it.

CO-HEARING OFFICER DODUC: Okay.

MR. HERRICK: Thank you.

CROSS-EXAMINATION BY

MR. HERRICK: Dr. Paulsen, your testimony begins sort of with four different opinions.

You recall that?

WITNESS PAULSEN: Yes.

MR. HERRICK: And those are a result of your various analyses, whether it's modeling or review of modeling of the Cal WaterFix Project or some permutation of it; is that correct?

WITNESS PAULSEN: Yes.

MR. HERRICK: Now, if you could step back for a minute.

And you're an expert at the hydrodynamics in the Delta; are you not?

WITNESS PAULSEN: Yes.

MR. HERRICK: No. That's a yes, not a yes.

WITNESS PAULSEN: Yes.

MR. HERRICK: And does it make sense to you

that, if a Project takes fresh water out of the Delta before it goes through the Delta, that you would have these sort of effects that the modeling shows.

WITNESS PAULSEN: Yeah. I mean, we talked at length in the Part 1 portion of this hearing.

And the concern was both that WaterFix would take more water out of the Delta under some scenarios and that, under almost all scenarios, it would take more Sacramento River water out of the Delta.

And Sacramento River water has better quality than most of the other sources to the Delta so that --

Uh-oh.

-- that does have an impact.

(Alarm sounds.)

BUILDING ANNOUNCEMENT: Attention all building occupants. Attention all building occupants.

A fire alarm has sounded on the 23rd floor, Floors 22, 23, and 24.

The Fire Department has given the all-clear.

Please return to your designated work areas.

I repeat:

Attention all building occupants.

A fire alarm has sounded on Floors 22, 23, and 24.

The Fire Department has given the all-clear.

Please return to your designated work areas.

Thank you.

CO-HEARING OFFICER DODUC: All right.

MR. HERRICK: And, Dr. Paulsen, you re -- you recall in Part 1 that the -- the Petitioners gave examples of when, in a sort of a dry period, when high flows came through the Delta after a storm event, that they could siphon off some of that to the benefit of the Projects; correct?

WITNESS PAULSEN: Yes.

MR. HERRICK: But, in fact, the Project actually proposes diversions from the North Delta diversions not just during high-peak flows but at other times, too; correct?

WITNESS PAULSEN: Yes. The North Delta diversions would take water under almost all the scenarios and year types.

The proportion varies with different year types or conditions, but the North Delta aqueducts -- North Delta diversion locations, I believe, divert water almost all the time. Just the proportion differs.

MR. HERRICK: And so it's even in dryer times that the -- the proposal is to divert from the North Delta, not just skimming off high flows; correct?

WITNESS PAULSEN: Right.

MR. HERRICK: I won't go into the EBC2 that we didn't -- We covered that pretty extensively in Part 1; didn't we?

Dr. Paulsen, do you know whether or not, during the last drought, that the 14-to-1 ratio which limits the discharges of the Sac Regional plant was at risk more often in prior times -- times before the drought?

WITNESS PAULSEN: I would use different words.

Certainly in dryer periods, they hit that ratio more often and had to divert to the basins more frequently. But their operations are robust. It's not that it puts anything at risk. They're able to do that but they have to do it more frequently.

MR. HERRICK: Yes.

And, as a hypothetical, if we have another drought and Petitioners filed for a TUCP to alter their operational scenarios included in the WaterFix right now, could that further put at risk that 14-to-1 ratio limitation on Sac Regional?

WITNESS PAULSEN: And, again, it's only the at-risk part of the question that I take issue with.

I think Regional San can operate to that under a wide range of conditions, but it could occur more

frequently.

MR. HERRICK: Okay. It's Mr. Robles; right?

WITNESS ROBLES: That's right.

MR. HERRICK: I don't want to insult anybody more than I normally do.

On your testimony, which is SRCSD-28, on Page 8 and 9.

And we don't have to bring that up but if you could just get to that real fast.

And that's where you talk about the -- the -- the -- the Sac Regional's comments to the various processes associated with WaterFix to address the issues that have been raised today; correct?

WITNESS ROBLES: Correct.

MR. HERRICK: And is it correct from your testimony that, in -- that you have not had any satisfaction in that the environmental documents did not specifically address the problems that have been -- that have been raised here today?

WITNESS ROBLES: That is correct.

MR. HERRICK: And you mention on Page 20 -- excuse me -- Page 9 on which your testimony that there's only one paragraph that you know of in the Final EIR/EIS which does note that there may be increases in the frequency of reverse flows; is that

correct?

WITNESS ROBLES: That I know of, correct.

MR. HERRICK: Now, in order to address your concerns, what sort of level of -- of analysis would need to be done in order to develop methods by which to avoid the impacts that you believe might occur?

WITNESS ROBLES: Well, some of that's touched on the modeling.

Based on the modeling, we believe we will have to divert more frequently and, therefore, these are unavoidable under the current scenarios. And, therefore, we would have to deal with this diverted water more often, more frequently, more pumping.

And, as I said in my testimony, verbally and written, there's a take of our storage basins based on the additional diversions.

MR. HERRICK: Your testimony's not just that there's an impact that might be mitigated or avoided but that it would happen, and the only result -- the only thing to be done in that event is to pay Sac Regional for the damages; is that correct?

WITNESS ROBLES: My testimony is that, based on the modeling, there will be an impact and that impact has a cost.

MR. HERRICK: Okay. And that would continue

ad infinitum; would it not?

WITNESS ROBLES: Under the current scenarios as I understand, that's correct.

MR. HERRICK: Okay. And could you tell us when the decision was made for the Echo Water Project to move forward on that?

WITNESS ROBLES: The FEQ Project?

MR. HERRICK: Yes.

WITNESS ROBLES: So we received our NPDES Permit in December 2010, and we began our early planning for the Project.

FEQ Project was something -- Expansion of the storage basins was identified early because the Biological Nutrient Removal Project was designed for 330 MPD max, so anything above that has to go through storage.

So it was early in the process through our Basin Design Report, I would say in the 2012-13 time range.

MR. HERRICK: So this is a -- So that's a, you know, five, six, seven, eight years ago; correct?

WITNESS ROBLES: On that order.

MR. HERRICK: And --

WITNESS ROBLES: Not eight, but I would say four or five years.

MR. HERRICK: And during that time, to your knowledge, there was no interaction between California WaterFix or BDCP efforts and the planning of the significant change in the discharge to the Sacramento River?

WITNESS ROBLES: Our Design Engineers that are part of the Echo Water Project did not consider the WaterFix impacts on the sizing of the basin expansion.

MR. HERRICK: Yes.

My question meant to be looking from the other side. The WaterFix, the BDCP process, didn't consult with you as you're developing your already-authorized or proposed program; correct?

WITNESS ROBLES: Not with me directly as an individual, but I cannot speak for the rest of the table.

MR. HERRICK: That's all I have. That's all I have.

Thank you.

CO-HEARING OFFICER DODUC: Thank you. And I don't see any other cross-examination.

Is there any redirect, Mr. Simmons?

MR. SIMMONS: Just a couple quick followups.

Could we have Exhibit 28 -- SRCSD-28 -- Page 9.

(Exhibit displayed on screen.)

MR. SIMMONS: This is Mr. Robles' testimony.

REDIRECT EXAMINATION BY

MR. SIMMONS: So I want to focus your attention on -- on the first paragraph relative to earlier questions, and particularly the sentence beginning on Line 9 which says (reading):

"Despite recognition (sic) that operation of the . . . Project will adversely affect Regional San's operation, DWR adopted no mitigation for this significant impact."

Is that still true, to the best of your knowledge?

WITNESS ROBLES: To the best of my knowledge, that's correct.

MR. SIMMONS: And Mr -- Could we put up -- No, we really don't need to put this up.

Mr. Somavarapu, could you look at Exhibit 32, which is your testimony.

WITNESS SOMAVARAPU: Yes, I have. Which page?

MR. SIMMONS: And would you look at Page 8, Lines 9 through 8 -- or Lines 2 through 8.

And those are two paragraphs Numbered 9 and 10.

WITNESS SOMAVARAPU: Yes. I'm looking.
MR. SIMMONS: In your mind, would that be acceptable mitigation relative to the increased demands on your storage?
WITNESS SOMAVARAPU: Yes. That's what we're proposing.
MR. SIMMONS: Thank you.
CO-HEARING OFFICER DODUC: Any recross?
MS. ANSLEY: Can I have one second?
CO-HEARING OFFICER DODUC: All right, Miss Ansley.
MS. ANSLEY: I'm going to see if I can call this up, with Mr. Hunt's help.
Can we look at SWRCB-102, Appendix 3B.
I don't want to get into, like, what Keeling did yesterday.
(Exhibit displayed on screen.)
MS. ANSLEY: Can we go to 3B-81, please.
(Exhibit displayed on screen.)
MS. ANSLEY: Can we go up to -- Can -- Can we go to -- Looking at the fast links at the side, can you go to just 3B.1?
(Exhibit displayed on screen.)
MS. ANSLEY: Oh. Excuse me. 3B.3.
There it is. Other commitments.

(Exhibit displayed on screen.)

MS. ANSLEY: Thank you. Sorry for that.

RECROSS-EXAMINATION BY

MS. ANSLEY: And if -- I think if -- if you can read that.

My question is to Mr. Robles who was just asked by his attorney whether DWR had adopted -- Here, you testified any mitigation for this, in your words, significant impact.

Are you familiar with this Section 3B.3 of the FEIR?

WITNESS ROBLES: No.

MS. ANSLEY: And do you see -- You are not familiar with it?

WITNESS ROBLES: No. I've not read every document associated with WaterFix. That was not my focus.

MS. ANSLEY: It's not your understanding that this commitment applies to the commitment that DWR made in -- that we spoke about earlier regarding developing operational protocols with Sac Regional?

WITNESS ROBLES: That -- I read that, and I understand your point. Yeah, I understand.

MS. ANSLEY: When you were preparing your testimony, though, it was not your understanding that

this commitment, which -- the commitment that was made with Sac Regional would be in 3B -- 3B.3.6.

MR. SIMMONS: Could we put that up?

MS. ANSLEY: Sure. That was -- That one was actually 3B-81, I believe.

(Exhibit displayed on screen.)

MS. ANSLEY: Okay. That this commitment was -- Even though it was not listed as an environmental commitment, it was -- it was committed to and adopted into the Project.

Is that your understanding?

MR. SIMMONS: Objection: There's -- There's been no testimony that the -- that the storage basins lack capacity to manage this problem. We're saying it comes at a cost.

This doesn't address the cost to Regional San. It simply says, "We'll make sure that you can handle it."

We can handle it. It's just that it costs the region to handle it.

MS. ANSLEY: I object to him providing testimony.

Mr. -- There has been representations about whether DWR has consulted with Regional San and what measures maybe that have been adopted into the Proposed

Project.

And all I'm trying to do is -- and this witness provided testimony on this point -- is just to understand if he is aware what's --

CO-HEARING OFFICE DODUC: Understood.

MS. ANSLEY: -- been adopted into the Project.

CO-HEARING OFFICER DODUC: Understood.

Overruled, and strike Mr. Simmons' testimony.

MS. ANSLEY: Mr. Robles.

WITNESS ROBLES: So, I want to highlight that the impacts to us are cost-wise. We will -- We would like to be able with the WaterFix costs -- I'm sorry -- WaterFix impacts through additional diversions, additional operations of maintenance cost and --

CO-HEARING OFFICER DODUC: Mr. Robles, that actually was not Miss Ansley's question.

WITNESS ROBLES: Okay.

CO-HEARING OFFICER DODUC: Miss Ansley.

WITNESS ROBLES: Please ask again.

MS. ANSLEY: Is it your understanding that this commitment that you hear -- see here on the screen was incorporated into the Project?

WITNESS ROBLES: That is my understanding.

MS. ANSLEY: That's all I have. Thank you.

CO-HEARING OFFICER DODUC: Thank you.

Does that complete Sac Regional San District's case in chief?

MR. SIMMONS: Yes, thank you.

CO-HEARING OFFICER DODUC: At this time, do you wish to move your exhibits into the record?

MR. SIMMONS: Yes, please.

Exhibits SRCSD-15, -17 through -26, -28 through -35, and -37 and -38.

CO-HEARING OFFICER DODUC: Any objections?

They are so received into the record.

(Sacramento Regional County Sanitation District's Exhibits SRCSD-15, SRCSD-17 through SRCSD-26, SRCSD-28 through SRCSD-35, and SRCSD-37 & SRCSD-38 received in evidence)

CO-HEARING OFFICER DODUC: Thank you very much.

Thank you all witnesses.

We will take a lunch break and, when we return, we will begin the East Bay MUD case in chief.

May I get an estimate, Miss Ansley or Mr. Mizell, of your cross-examination for the EBMUD panel?

MR. MIZELL: Tripp Mizell, DWR.

We're estimating roughly an hour.

CO-HEARING OFFICER DODUC: We will return at 1 o'clock.

(Lunch recess at 11:57 a.m.)

* * *

Wednesday, March 28, 2018 1:00 p.m.

PROCEEDINGS

---000---

CO-HEARING OFFICER DODUC: All right. It is 1 o'clock. We are resuming.

Before we get to the East Bay MUD panel, a couple of housekeeping items.

I -- Conny, has this be sent out or will it be sent out?

MS. MITTERHOFER: It will be sent out.

CO-HEARING OFFICER DODUC: Okay. Later this afternoon, staff will be sending out a revised schedule for Part 2.

I've already informed you earlier that we are canceling next Friday's hearing date. That would be March 30th.

In addition to that, we're also canceling April 5th and 6th, April 12th and 13th, and April 26 and 27. Those are all Thursdays and Fridays.

That will be officially sent out later this afternoon.

All right. Any other housekeeping matter?

Not seeing any, may I ask your witnesses to rise and raise their right hands.

Michelle Workman,
Benjamin Bray,
and
Jose Setka,
called as witnesses by East Bay Municipal Utilities District (EBMUD), having been duly sworn, were examined and testified as follows:

CO-HEARING OFFICER DODUC: Thank you.

And you submitted a written Opening Statement. Do you wish to make an oral Opening Statement?

MR. SALMON: Yes, we have a brief Opening Statement.

CO-HEARING OFFICER DODUC: All right.

MR. SALMON: Following --

CO-HEARING OFFICER DODUC: And then --

MR. SALMON: -- that, I expect about 45 minutes of direct testimony.

CO-HEARING OFFICER DODUC: Perfect.

So Mr. Hunt has that down and we will now begin with your Opening Statement.

MR. SALMON: Thank you.

OPENING STATEMENT

MR. SALMON: Good afternoon. My name is Jonathan Salmon, attorney for East Bay Municipal

Utility District. I'm here with Mr. Fred Etheridge also representing East Bay MUD.

Here on the panel today for our -- Part 2 of our testimony in this proceeding, we have three expert witnesses: Michelle Workman, Benjamin Bray, and Jose Setka.

The WaterFix Project will pose a threat of mortality to Mokelumne River anadromous fisheries over multiple of the fish life cycle if the change petition is approved by the terms of the Petitioners.

Projected increased openings of the Delta Cross Channel in the fall upmigration period would impact the Mokelumne-origin fall-run Chinook adult Salmon population.

And projected increased South-of-Delta pumping during the critical spring outmigration season would impact Juvenile Mokelumne-origin Chinook and Steelhead.

These impacts would each unreasonably affect the Mokelumne River Fisheries' ecosystem and public trust resources.

East Bay MUD will present testimony explaining why the Project may cause these impacts and proposing conditions to avoid or mitigate them.

First, East Bay MUD will present the testimony of Jose Setka, the Manager of East Bay MUD's Fisheries

and Wildlife Division.

Mr. Setka will summarize East Bay MUD's decades-long Fisheries Program on the Mokelumne River, which includes a comprehensive suite of flow and non-flow measures, as well as extensive ecosystem modeling or -- pardon me -- monitoring.

East Bay MUD implements the Program in partnership with the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service. Mr. Setka will explain the Program's successes.

He will then summarize the fishery impacts to Mokelumne-origin fall-run Chinook Salmon caused by DCC openings in the October-to-November upmigration period.

Mr. Setka will describe previous efforts by agencies to try to address these impacts through closure of the DCC for critical fall periods.

He will then review the Petitioners' documentation that shows increased openings of the DCC under the WaterFix Project during the critical October and November upmigration period.

If increased DCC openings are allowed to occur during these months, the Project would cause significant additional fisheries impacts to migrating Adult Mokelumne-origin Salmon.

Even though Petitioners have identified this

increase in fall DCC openings, they have not adequately addressed the harms those gate openings would cause to the Mokelumne Salmon Fishery.

Mr. Setka will propose a condition to avoid or mitigate these fishery and public trust impacts and request that the State Water Board include the condition in any approval of the Change Petition.

Michelle Workman, East Bay MUD's Supervising Fisheries Biologist, will present testimony describing the Project's potential impacts to outmigrating Mokelumne-origin Juvenile fall-run Chinook Salmon and Central Valley Steelhead.

Ms. Workman will explain how pumping at Jones and Banks Pumping Plants in the South Delta entrains natural- and hatchery-origin Juvenile Salmonids migrating from the Mokelumne River to the ocean and how that pumping delays outmigration, which increases the exposure of fish in the interior Delta to predation, unscreened diversions, and poor water quality.

Ms. Workman will use data from modeling runs performed by Petitioners for this hearing to explain the potential for Project operations to result in increased diversions at the South Delta facilities during the crucial April-and-May outmigration period.

Ms. Workman will explain how increased South

Delta diversions during those months would impact fish and lead to additional mortality.

She will propose conditions to avoid or mitigate the Project's impacts to Juvenile Mokelumne River Chinook and Steelhead.

Finally, East Bay MUD's modeling expert, Dr. Benjamin S. Bray assisted Ms. Workman with the modeling-related aspects of her testimony. He is available for cross-examination.

So, before we begin, I would like to ask our witnesses to authenticate their testimony. We'll start with Mr. Setka.

DIRECT EXAMINATION BY

MR. SALMON: Mr. Setka, is Exhibit East Bay MUD-104 a true and correct copy of the PowerPoint summary of your testimony?

WITNESS SETKA: Yes, it is.

MR. SALMON: Is Exhibit EBMUD-129 a true and correct copy of your Statement of Qualifications?

WITNESS SETKA: Yes, it is.

MR. SALMON: Are you familiar with Exhibit EBMUD-155?

WITNESS SETKA: Yes, I am.

MR. SALMON: Is that your testimony?

WITNESS SETKA: Yes, it is.

MR. SALMON: Are the documents attached to Exhibit EBMUD-155 as Appendix B and Appendix C, which are letters from the California Department of Fish & Game and from the Mokelumne -- the Lower Mokelumne River Partnership, respectively, true and correct copies of those two documents?

WITNESS SETKA: Yes, they are.

MR. SALMON: Is Exhibit EBMUD-182 a USBR Delta Cross Channel Temporary Closure multiyear study a true and correct copy of that document?

WITNESS SETKA: Yes, it is.

MR. SALMON: And is that document referenced in your testimony?

WITNESS SETKA: Yes, it is.

MR. SALMON: Ms. Workman, is Exhibit EBMUD-105 a true and correct copy of the PowerPoint summary of your testimony?

WITNESS WORKMAN: Yes, it is.

MR. SALMON: Is Exhibit EBMUD-130 a true and correct copy of your Statement of Qualifications?

WITNESS WORKMAN: Yes, it is.

MR. SALMON: And is -- Are you familiar with Exhibit EBMUD-156.

WITNESS WORKMAN: Yes, I am.

MR. SALMON: And is that your testimony?

WITNESS WORKMAN: It is my testimony.

MR. SALMON: And are Exhibits EBMUD-183 and EBMUD-184 true and correct copies of documents referenced in your testimony?

WITNESS WORKMAN: Yes, they are.

MR. SALMON: And, Dr. Bray --

WITNESS BRAY: Good morning.

MR. SALMON: -- we've already, I believe, authenticated your Statement of Qualifications in Part 1, but I will ask you again:

Is Exhibit EBMUD-127 a true and correct copy of your Statement of Qualifications?

WITNESS BRAY: Yes, I believe it is.

MR. SALMON: And is Exhibit EBMUD-157 your testimony for Part 2 of this hearing?

WITNESS BRAY: Yes, it is.

MR. SALMON: Thank you.

And Ms. Workman or -- pardon me -- Mr. Setka, we'll start with you.

And can we please see Exhibit EBMUD-104 --

(Exhibit displayed on screen.)

MR. SALMON: -- which is the summary of Mr. Setka's testimony.

And, Mr. Setka, please summarize your testimony.

WITNESS SETKA: All right. Thank you.

Well, good afternoon, Hearing Officers and staff.

My name is Jose Setka. I'm the Manager of Fisheries and Wildlife for East Bay MUD.

I have worked on the Mokelumne River since 1992.

From '92 to 2008, I worked as a biologist on the river and conducted a number of different monitoring projects, research projects associated with Salmon within the river, both in terms of monitoring Adult escapement, spawning surveys, juvenile surveys, and habitat mapping and restoration.

From 2008 through 2013, I oversaw and supervised the Lodi Fisheries Office for East Bay MUD, which is charged with the science -- Monitoring and Science Program for the Lower Mokelumne River and the Delta.

And since 2013, I've continued to oversee that operation there and also include the East Bay watershed lands and service areas within the East Bay.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS SETKA: In my presen -- summary presentation today, I'll be covering the following:

First, I'll provide a brief background on the Mokelumne River Salmon Fishery.

Then I will move on to discuss and provide examples on how the current operations within the Delta, and particularly with the Delta Cross Channel, after Mokelumne River Fisheries by providing false migratory cues which ultimately lead to straying.

I will then go on to describe how the Project Alternative will further impact the fishery through additional closures and long-term closures.

Finally, I will conclude with a discussion on Petitioners' inadequate analysis in respect to the Mokelumne Fisheries and our recommended Permit term to minimize Project impacts.

Unless there's a condition in the Permit terms related to operating the DCC conditions for -- the Mokelumne Salmon population will be worse under the Project Alternative.

Next slide.

(Exhibit displayed on screen.)

WITNESS SETKA: This map here shows the Mokelumne River. First, it shows it in relation to some of the other Central Valley rivers there within the central inset. And then it gives a much closer look kind of blown up there.

And the Mokelumne River flows from the base of Camanche Dam approximately 70 miles down to its confluence with the San Joaquin River. The river flows through the City of Lodi and Woodbridge Irrigation District Dam.

Within the lower river, tidal cycles can be observed beginning just upstream of its confluence with the Consumnes River.

The Mokelumne River is considered a essential -- a Central Delta tributary within the Central Valley.

The DCC -- which will be referenced later in more detail -- here on this map is located just upstream of the Mokelumne forks on the left side of the figure. And within the Central Delta also, the Mokelumne has two forks, a North Fork and a South Fork before it joins the San Joaquin River.

The DCC, the structures used to move a portion of the Sacramento River flow into the interior Delta for export or to improve interior Delta water quality. And its operational aspect, I'll cover in more detail later on in my summary.

Next slide.

(Exhibit displayed on screen.)

WITNESS SETKA: The Mokulmne River Fishery

Program has -- is managed by Lower Mokelumne River Partnership and East Bay MUD. Additional members of the partnership are California Department of Fish and Wildlife and U.S. Fish and Wildlife Service. Other participants within those meetings also include National Marines Fishery Service, local irrigation Districts, NGOs and other stakeholders.

The Partnership was formed as a result of a Joint Settlement Agreement, or JSA, between EBMUD, CDFW and U.S. Fish and Wildlife Service.

The partnership has implemented numerous flow and non-flow management actions to improve conditions in the Lower Mokelumne River and increase the population of Chinook Salmon.

Flow actions include flow schedule based on water year type and Salmon life history stage, adaptive management of flows to ensure availability of water for attraction flows during drought conditions and modifications to protect reservoir coldwater pool supply for the fall spawning period.

Non-flow measures include spawning gravel enhancement, creation of shallow water habitat, and actions associated with improved hatchery management.

Since implementation of the Joint Settlement Agreement in 1998, there has been significant

improvement in habitat and increases in Salmon numbers in the Mokelumne River. Moreover, these successes continued even during the most recent drought.

Next slide.

(Exhibit displayed on screen.)

WITNESS SETKA: This graph depicts the annual returns of the Lower Mokelumne River from 1940 through 2016. The Y-Axis is the number of Salmon while the X-Axis is the year.

The black horizontal lines indicate different periods during that -- that 1940-through-2006 timeframe.

The first one is pre-Camanche Dam. That's towards the left side of the graphic.

The second dark horizontal line is post-Camanche Dam construction.

And then that last one towards the right side is the post-JSA average. And those are all average returns during those periods.

Since JSA implementation, the average return of the Mokelumne River has more than doubled. In fact, during the fall '27 (sic) period, or season, the return of the Mokelumne River was nearly 20,000 fish and broke the record established in 2011.

Moreover, returns continued to be well above

average during the latest drought period, and drought periods here are indicated by that -- the shaded regions within the graphic there.

The result and performance of the measures implemented to improve outcomes on the Lower Mokelumne River have clearly been successful.

Next slide.

(Exhibit displayed on screen.)

WITNESS SETKA: On a broader scope, management actions taken within the Lower Mokelumne River have resulted in it being one of the few Central Valley Rivers to obtain its CVPIA doubling goal as set by the U.S. Fish and Wildlife Service Anadromous Fish Restoration Program.

The doubling goal is one of the few measurable criteria common to all Central Valley tributaries. And as of 2015, the Mokelumne had achieved an AFRP standard of 8,976, with the target being 9,300.

This success is particularly impressive considering the Mokelumne River Watershed comprises approximately 1 percent of the Central Valley Watershed.

The benefits of successful actions on the Mokelumne River go well beyond the watershed. In most years, Mokelumne River Salmon -- the Mokelumne River

Salmon population contributes about 15 to 20 percent of the commercial and recreational harvest off the coast of California.

In 2017, it is estimated that the Mokelumne River Salmon made up approximately 35 percent of the ocean recreational harvest and 20 percent of the commercial harvest.

The social and economic benefits of this population and associated hatchery program are significant. The Mokelumne River Fishery plays a key role in the continued viability of the recreational and commercial fisheries of the state.

Next slide.

(Exhibit displayed on screen.)

WITNESS SETKA: In regards to the Proposed Project, the potential impacts on the Mokelumne River Fishery resources, I will review the operation of the CVP and SWP operations specific to the Delta Cross Channel during the fall upmigration period.

The facilities located near Walnut Grove, shown on this graphic near the base of the uppermost red arrow. When open, the arrows depict the direction of water movement from the Sacramento River down the Mokelumne forks. This direction can be reversed during incoming tides.

The main stem of the Mokelumne River enters at nearly the same point as the diverted Sacramento River water, seen here at approximately the center part of the map.

Next slide.

(Exhibit displayed on screen.)

WITNESS SETKA: The Cross Channel Gates are generally open to convey Sacramento River water to the Project plants while meeting Central Delta water quality standards.

Flows through the facility can vary and can exceed 3500 cfs. Additionally, tidal action can result in a reverse flow, pulling water upstream through the gates.

Salmon are dependent on a variety of cues during their migration from the ocean to their natal spawning grounds. Olfactory cues, or smell, and flows are interrelated and play key roles during the final phases of migration.

When the DCC Gates are open in the fall, the resultant flow magnitude and direction creates false cues for Adult Salmon, resulting in delays of migration and spawning along with straying.

Moreover, the significant volume of water being moved through the DCC overwhelms fall peak

Mokelumne River flow outflow and associated migration cues.

Next slide.

(Exhibit displayed on screen.)

WITNESS SETKA: Of the existing impacts related to the current DCC operations, straying is one of the most significant.

In regards to Salmon, straying is when an individual fish returns to a river or stream other than its natal birth stream.

For the Mokulmne River Salmon, fall openings in October and November result in less Mokelumne-origin Salmon returning to their home river, the Mokelumne, and more of those fish straying to other systems.

Additionally, the ability of individual river systems to maintain stocks adapted to local conditions is hampered by strays to the system.

Ultimately, the operations of the DCC that lead to increased straying reduces the ability of East Bay MUD and the Lower Mokelumne River Partnership to meet the key Delta-wide standard of AFRP doubling goal.

Next slide.

(Exhibit displayed on screen.)

WITNESS SETKA: The impacts of the DCC operations on Mokelumne Salmon are well known and have

been acknowledged as far back as the 1980s.

The issue was brought to the forefront in 2008 during the Central Valley Salmon stock collapse during which returns to the Central Valley were some of the lowest ever recorded. In 2008, the return to the Mokelumne River Numbered 412 fish.

Along with the overall stock collapse, an additional factor that contributed to the low return in 2008 for the Mokelumne is that over 90 percent of the Mokelumne Salmon returning to the Central Valley strayed to other river systems, primarily the American River. During the 2008 migration period, the DCC was opened until November 10th.

As a result of poor returns in 2008 and contributing factors related to straying, East Bay MUD and the Partnership agencies made a number of requests to the Bureau -- U.S. Bureau of Reclamation for closures during subsequent fall periods to improve migration cues, reduce straying, and aid in rebuilding stocks after the 2008 collapse.

In 2011, a 10-day closure was implemented in October.

Next slide.

(Exhibit displayed on screen.)

WITNESS SETKA: Pictured here is a comparison

of stray rates of the Mokelumne-origin Salmon between 2008 with no closure -- and that's on the left side -- and 2011 on the right side.

Green depicts the Mokelumne returns and is what we would want to see fill most of the pie charts there.

In 2008, only 9 percent of Mokelumne-origin Salmon returned to their natal river, and you can see by the small ring piece there.

On the other hand, over 60 percent in that year returned to the American River. That's Mokelumne fish entering the American River.

When compared to the 2011 when there was a 10-day closure and attraction pulse flows on the Mokelumne, 82 percent of Mokelumne-origin fish returning to the Central Valley made it home to the river. Not surprisingly, in 2011, the Mokelumne return was a record of 18,589 at that time.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS SETKA: Based on the success of the 2011 closure -- closures, agencies again focused on making long-term efforts to study and develop recommended changes for DCC fall operations.

However, even prior to 2011, a BDCP working

draft document recognized the issues and included a recommendation for closures of 15 days in each October and November to improve migratory cues for all Adult Salmon.

In 2012, CDFW made comments to the State Water Resource Control Board recommending closures in October.

In 2012, USBR worked with East Bay MUD to -- and the partnership to develop a Study Plan analyzing closures and the impact on straying rates.

More recently, CDFW requested closures of the DCC to improve migratory cues for Salmon, primarily Sacramento River-origin fish from Mokelumne Natural Fish Hatchery.

The gates were closed approximately four days each week beginning mid-December 2017 for a total of approximately 38 days during that October-and-November period.

It's not surprising as a result of multiple closures of long durations that, in 2017, the Mokelumne Salmon return set a new record with over 19,950 fish returning to the river.

Up to this point, I've reviewed the Mokelumne Salmon Fishery and described improvements made by East Bay MUD and the Lower Mokelumne River Partnership.

I've demonstrated the population's vital contribution to sustaining commercial and recreational fisheries of the state and how the DCC influences ability -- the ability for the population to meet targets such as the CVPIA doubling goal.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS SETKA: Now I will discuss what additional impacts the Proposed Project and resulting change in operation could have on the Mokelumne River Fishery interests.

The task is difficult due to the lack of a clear, concise Operating Plan for the Project. There's much discussion on real-time operations without clarity regarding specific actions to be taken as part of these operations.

There are no indications that monitoring exist or would be implemented to better manage operation of the DCC to alleviate or reduce straying of Adult Salmon. Also, the analysis of the Mokelumne River Fishery in relation to the Project is virtually nonexistent.

In regards to the Adult Salmon in the fall migration period, I will focus on the key identifiable impact. The Project will result in openings of longer

duration, more days, during the October-through-November period.

Next slide.

(Exhibit displayed on screen.)

WITNESS SETKA: DCC operation would significantly be altered during the month of November.

In the 2016 Biological Assessment for the WaterFix hearing, modeling for the Proposed Project alternative indicates that most common opening -- the most common opening duration in November will go from three days under the No-Action Alternative to 20 days under the Project Alternative.

Next slide.

(Exhibit displayed on screen.)

WITNESS SETKA: This graphic is from the 2016 water -- California WaterFix Biological Assessment, and it depicts the difference between -- differences between No-Action Alternative and the Project Alternative in regards to DCC openings in November.

The No-Action Alternative number in duration of openings can be seen in the blue bars, whereas the Project Alternative are in -- is within the red bars.

And on the bottom of the graphic, you can see the duration of the openings, ranging from one day all the way to 20 days.

And then on the Y-Axis, the upper -- yeah -- Y-Axis is the number of those openings that would last those specific durations.

As you can see, operations change from a more frequent short opening to increased long-duration openings. In fact, the number of days the DCC could be open in November increases from 216 days to 309 days during that period.

Within the BA, it also states that some portion of the upstream migrating Adult Salmon, including -- Salmonids, including Steelhead, could be delayed by greater frequency of open -- of multi-day openings and subsequent closure under the Project Alternative in some years and that further study would be required.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS SETKA: The table -- This table is an excerpt from the BA depicting the exceedance probabilities for the DCC Gate openings in October and November. Each month is depicted individually with comparisons of the probability of exceedance between the No-Action Alternative and Project Alternative.

On average, there's an increase in openings in both October and November in the order of 8 percent and

26 percent, respectively.

It is important to note that the duration of openings are predicted to be longer in addition to the number of openings.

As I stated earlier, the Project currently has substantial effect on the Mokelumne River Salmon population through openings in the DCC resulting in false cues, migration delays, and increased straying.

Not only is the Proposed Project not improving conditions during the fall migration period, it is making migratory conditions substantially worse for Salmon -- Salmonids in the area and, particularly, the Mokelumne River Salmon population.

Next slide.

(Exhibit displayed on screen.)

WITNESS SETKA: On at least three occasion -- three occasions during the various iterations of the WaterFix Project, East Bay MUD has provided detailed written comments on the potential impacts along with data to support the conclusions.

The District expressed its concerns regarding the lack of an Operating Plan for the Project. East Bay MUD also provided data indicating that existing operation of the DCC Gates during the fall contributed to straying of Mokelumne fish and that the Proponents'

own modeling indicated that the gates would be open for longer periods during October and November.

EBMUD provided support -- supporting tangible data to demonstrate the impacts which was substantiated by the CDFW and the U.S. Bureau of Reclamation.

We also indicated that the reliance on DSM-II QUAL fingerprinting modeling to analyze impacts to Mokelumne Fisheries was inadequate and not the appropriate tool.

Next slide.

(Exhibit displayed on screen.)

WITNESS SETKA: In my testimony and during the summary, I've reviewed the status of the Mokelumne River Salmon population, its vital importance to the overall Central Valley fall-run, commercial and recreational fisheries, and associated social and economic values.

I have reviewed the impact of current operations as they relate to the DCC operations and migratory cues.

In asking the Board to consider imposing terms and conditions on the Project, I have outlined that the Project will make migratory conditions substantially worse through increasing fall DCC openings.

In my testimony, I presented letters and other

documents from resource agencies supporting the action of increasing DCC closures during the key migratory fall period.

The record for Mokelumne returns in 2011 and 2017 occurred when DCC Gates were closed for extended periods.

Finally, I have noted that, in 2010, the BDCP draft indicate -- or recommended DCC closures of 15 days in each October and November.

Next slide.

(Exhibit displayed on screen.)

WITNESS SETKA: Based on the testimony presented and in order to protect the Mokelumne River Salmonid Fishery from anticipated Project impacts, we request the following term and condition be added to the Permit:

The DCC Closure Plan, daily or based on tidal cycles, shall be modified to include the following closure periods during the months of October and November.

The DCC shall be closed for 15 days per month during the months of October and November with said closures to be coordinated, to the extent feasible, with October and November pulse flows from the Lower Mokelumne River.

This concludes my testimony, and thank you for your time and attention.

MR. SALMON: And with that, we will move to Ms. Workman, who will testify as to impacts on outmigrating Juvenile Salmonids.

Could we please display Exhibit EBMUD-105.

(Exhibit displayed on screen.)

MR. SALMON: And, Ms. Workman, when you're ready, please summarize your testimony.

WITNESS WORKMAN: Thank you.

Good afternoon. My name is Michelle Workman and much like Jose, I've been working on the Mokelumne River since 1993, one year later.

I've come up through the ranks of the Biologists on the river managing many of the programs on the ground and into my current position as the Supervisor for the Lodi Fisheries and Wildlife office.

In my current capacity, I oversee the Mokelumne River Anadromous Fishery's Monitoring and Research Program. And I'm here today to testify about potential WaterFix operational impacts to juvenile outmigrating Mokelumne River Salmonids.

Next slide, please.

(Exhibit displayed on screen.)

WITNESS WORKMAN: So today, I'd like to make

three main points with my testimony for your consideration.

The first is that Mokelumne River Juvenile Salmonids are currently impacted from operations of the Central Valley Project and the State Water Project South Delta diversions.

This impact comes from both direct entrainment as well as indirect mortality related to extended exposure to stressors in the interior Delta during migration.

Number two, the Petitioners' modeling has shown that California WaterFix has the potential to increase South Delta diversions under some operational scenarios.

If South Delta diversions are increased during the spring outmigration, I believe the results would be additional mortality of Mokelumne River Salmonids, which include both hatchery and natural runs of fall-run Chinook Salmon and Central Valley Steelhead.

And, third, in my opinion, this increased mortality of Mokelumne River Salmonids could be minimized by conditioning any order approving Petitioners' Change Petition in a manner that addresses these impacts in the critical outmigration period.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: So I'd like to use this graphic to put my testimony into some spatial context.

This map depicts some know migration routes of yearling Steelhead on the Mokelumne River from a published Acoustic Study connected by East Bay MUD scientists.

And those are the -- the stippled and black and gray routing lines through the Delta. And it also shows the two fairly common, although not exclusive, hatchery release locations. And I'm going to use those two red dots to -- to talk about two different release strategies that lead to very different outcomes.

So the red dot in the upper right-hand corner of the graphic depicts New Hope Landing, and I'm going to refer to releases in that general region as east of Delta.

And then the red dot down below represents Sherman Island, and I'm going to use that generally to speak of releases on the west of Delta.

And since 2007, the majority of the hatchery releases has -- have occurred in that west-of-Delta location in an attempt to improve survival in adult returns to the Mokelumne River.

Prior to that, many of the releases were made

in the New Hope Landing area or East-of-Delta Region.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: So, as I mentioned, direct entrainment is one impact to Mokelumne anadromous fish currently and we have both direct and indirect evidence of that.

The direct observations come from coded wire tag data. Every year, a portion of the Chinook fall-run Salmon that are raised at the Mokelumne Hatchery are marked with a coded wire tag and that gives us information about their river of origin and their release location.

While Steelhead are not typically coded wire tagged, we do have three years of coded wire tag release data on Steelhead from 2004 to 2006. And I'll be using those to represent direct evidence of entrainment.

Where we don't have direct evidence of tagged fish, I relied on the relationship of timing, size, and number of Mokelumne fall-run Chinook and Steelhead, and matching those in with entrainment numbers at the South Delta diversions as indirect evidence that the Mokelumne Salmonids are contributing to these numbers of unmarked fish.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: So this graphic depicts the relative difference in entrainment vulnerability based on release location from Mokelumne Hatchery Chinook releases. East-of-Delta releases are shown in blue bars, and West-of-Delta releases are shown in black bars.

East of Delta release -- Excuse me.

This shows that fish released east of Delta are more vulnerable to entrainment than the West-of-Delta releases with the trend continuing even after most hatchery releases had been shifted to the West-of-Delta location. And this simply shows how vulnerable Mokelumne Salmonids are migrating through the interior Delta.

Overall, 92 percent of all known Mokelumne captures at the South Delta diversions are from the East-of-Delta releases.

So while releasing fish at Sherman Island appears to be a successful strategy to minimize entrainment effects, it's not a sustainable practice for the hatchery fish, and the natural fish don't have the opportunity to participate in that program.

So Mokelumne-origin Salmonids will continue to

depend on the interior Delta as a migration pathway, and they cannot sustain even incremental impacts to survival rates due to the hundred percent reliance of the interior Delta for migration.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: As I move to discuss the direct evidence of hatchery Steelhead entrainment, it's important to -- that I mention that the natural Steelhead population of the Mokelumne River is part of the federally listed Central Valley distinct population segment.

And, currently, the hatchery Steelhead are not part of that federal listing status. But in the 2016 NMFS five-year status review of the species, NMFS has recommended the Mokelumne River Hatchery stock to be included in the federal listing status. And we fully expect a listing decision in the future that would include this stock as listed.

So, the direct observational evidence of entrainment for Mokelumne Hatchery Steelhead comes from the coded wire tag data we had from 2004 to 2006. And with each of these releases, tagged Steelhead from these release groups were recovered at the South Delta facilities over a range of one to nine weeks,

highlighting their current risk of entrainment.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: And as I mentioned, we use timing of immigration from the Mokelumne compared to the timing of salvage data at the pumps as indirect evidence of Mokelumne Salmonid entrainment.

Naturally produced fall Chinook Salmon attempting to migrate from the Mokelumne River are monitored at a rotary screw trap just above tidal influence.

This figure shows the relationship between Mokelumne River outmigrant timing and calculated losses of unclipped Chinook showing up at the South Delta diversions.

And this leads me to conclude that the Mokelumne fish are likely making up a portion of these unclipped fish, contributing to losses at the South Delta facilities.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: And we see the same relationship with unclipped or naturally produced Steelhead leaving the Mokelumne and showing up at the South Delta diversions.

And given the fact that, during this time period, the spring outmigration, the majority of the time the Delta Cross Channel Gates are closed from December through May, this would limit at least the proportion of Sacramento Basin Steelhead that contribute to this group and make it even more likely that the Mokelumne Steelhead are making up a significant portion of this catch.

Next slide.

(Exhibit displayed on screen.)

Fork length data provides additional evidence that Mokelumne fish are part of the savaged Steelhead at the South Delta facilities.

This graphic represents, in the red dots, the size distribution of yearling Steelhead leaving the Mokelumne River in the spring, and then the gray dots are the size distribution of the Steelhead yearlings showing up at the South Delta facilities.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: And there's a similar relationship with the -- with the AdClipped fish, so this is the same representation except for the hatchery fish.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: This figure provides some more evidence of the relationship between yearling-hatchery Steelhead releases from the Lower Mokelumne River and estimated losses of hatchery Steelhead at the South Delta facilities.

If you note the scale on the vertical access, the green dots represent hatchery releases of fish.

And so you see that first green dot on January 1st of over 100,000 fish. And then we see a long tail out of recoveries of AdClipped fish at the South Delta facilities.

And then, as we release smaller numbers of fish for directed studies in May, we see additional hits of recoveries of clipped fish showing up at the facilities.

And, again, since the DCC Gates are closed at this point, only a portion of the Sac Basin fish would be entrained and represented here, and there are no AdClipped Steelhead coming out of the San Joaquin system.

So, to sum up this section of my testimony, we have coded wire tag evidence. We also have fork length data and timing data for both Chinook and Steelhead that are entrained under existing conditions that show

the clear risk for Mokelumne River Salmonids.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: The second impact I mentioned in my opening statement is the indirect impact related to delayed migration through the interior Delta.

Operation of the South Delta facilities can prolong the outmigration of Salmonids based on flow cues even at existing pumping levels.

It's been well established that the more time Juvenile Salmonids spend in the interior Delta, the more susceptible they are to numerous stressors there and it has survival impact on the population.

Outmigrating Mokelumne River Salmonids in the interior Delta can be entrained into unintended migratory pathways as a result of changes in magnitude and direction of flow, and this may delay the migration process.

And the big difference between these impacts on Mokelumne River Fisheries and Sacramento Basin fish is that the entire Mokelumne River population that is trying to volitionally migrate out of the system is subject to those increased mortality risks, whereas the Sacramento Basin fish are only partially subjected to

those.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: So, so far, I've talked about the South Delta diversions under existing conditions.

I've described the direct and indirect evidence that leads me to believe that there are current operational impacts that affect Mokelumne River Salmonid outmigration.

This evidence is important because Petitioners have stated in their testimony that there are already reasonable protections in place in the form of existing RPAs in the 2008-2009 Biological Opinions.

But it's my opinion that these do not adequately address current impacts to Mokelumne Salmonids and that the California WaterFix Biological Opinion does not adequately address the increased impacts that may be caused by California WaterFix operations.

So now I want to discuss some of the results from the Petitioners' modeling that show that, under a number of scenarios that fall within the range of foreseeable operations, the conditions may worsen the existing impacts of South Delta diversions on the

survival of outmigrating Mokelumne anadromous fish.

We reviewed the Petitioners' modeling specifically for the Salmonid outmigration period and found that there are modeled increases in South Delta diversions in April and May in three of the four modeled scenarios, the Boundary 1, H3 and H4, with these increases most pervasive under the B1 condition.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: So I'm going to use the following six graphics to support my opinions regarding increased impact.

So this first graphic is the April time series data for South Delta diversions where the No-Action Alternative is the red solid line, the Boundary 1 scenario is the blue solid line, and the H3 and H4 are purple, stippled, and dashed lines respectively.

It shows that the Boundary 1 model scenario increases South Delta diversions compared to the No-Action Alternative in many instances in April and less frequently in H3 and H4 scenarios also result in increased South Delta diversions.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: This graphic is the same

time series data but for May.

And here, again, you see increased South Delta diversions in the Boundary 1 scenario as compared to the No-Action Alternative and like the April time series data in some cases as well as in H3 and H4.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: Since we saw the increased South Delta diversions when looking at all years, we wanted to look a little closer to see if this only occurred during wet years when there was potentially more water available, or could it happen in drier years as well?

So we disaggregated the model output data into wet, which included wet, normal and below-normal years, and then dry, which included dry and critically dry years based on the Sacramento Index.

When we did this, we saw more scenarios demonstrating increased pumping rates and frequency from the South Delta diversions as compared to No-Action.

This first plot is of April of wet years, and there are increased South Delta diversions under the Boundary 1 condition, which is covered by the solid green line, about 75 percent of the time over the

No-Action Alternative.

And, then, for the H3, it's about 25 percent of the time, which is that green dashed line.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: So we went to look at April of dry years.

This was particularly concerning because the potential for increased South Delta diversions appear to be even more predominant, occurring 100 percent of the time for the Boundary 1 scenario, 45 percent of the time for the H3 scenario, and approximately 40 percent of the time for the H4 scenario.

So based on this, the risk of increased South Delta diversions and the consequential impacts to Mokelumne Salmon and Steelhead is by no means limited to a boundary operational scenario.

These increased diversions on fishery impacts may well occur during the critical migration window even if WaterFix was actually operated to a more conservative operational scenario like H3 or H4.

This is concerning because it shows a middle-of-the-road operational scenario may lead to impacts at key migration times; and, second, it shows that increased South Delta pumping would not just occur

in wet years when the WaterFix is taking what could be considered excess water.

The additional pumping in April could be most pronounced in dry years, which could lead to population level impacts to Mokelumne-origin Salmonids since, again, 100 percent of those migrants have to use that interior Delta corridor.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: Moving on to May of wet years, we see a similar condition as April wet years with the South Delta diversions being greater in the B1 scenario than over the No-Action Alternative about 75 percent of the time, and about 10 percent of the time for the H3 scenario.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: And then in May of dry years, we see greater South Delta diversions under the Boundary 1 condition over the No-Action about 95 percent of the time.

So, overall, for April and May, the impacts would be most acute if WaterFix operations resemble the Boundary 1 scenario, which is within the range of foreseeable operations.

And, additionally, impacts in April of dry years could lead to population level impacts for Mokelumne Salmonids.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: So to recap what I've presented so far, the Petitioners' modeling show increased South Delta diversions may occur in April and May, leading to the potential for WaterFix Project to impact Mokelumne Juvenile Salmonids migrating through the Delta.

The current pumping rates already entrain Juvenile Chinook and yearling Steelhead and delay their migration through the Delta, increasing their exposure to interior Delta stressors.

So increased pumping could make these impacts worse for Mokelumne Juvenile Chinook and yearling Steelhead and result in more entrainment and losses from these populations.

In the next two graphics, I'll use some existing data and published research that support my opinion that these operations could translate into additional losses.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: This figure shows the relationship of South Delta export volumes against estimated Steelhead losses at the South Delta facilities.

And, as you can see, losses increase steadily as export volumes increase. Mokelumne Steelhead are vulnerable to entrainment in the South Delta facilities, and increased pumping at those facilities would likely lead to an increase in Mokelumne Steelhead entrainment.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: Mokelumne Chinook may also be impacted by increased South Delta exports similarly to Steelhead.

To illustrate this, I used an expert from Kimmerer 2008 which shows the relationship between export flows and Sacramento Basin Chinook Salmon salvage. This figure shows that the estimated salvage at the export facilities increases with increasing export flow.

In this publication, Dr. Kimmerer also evaluated the population level consequences for Sacramento Basin fish and concluded that even though only a portion of Sacramento fish are vulnerable to

entrainment, the current level of exports would constrain recovery of winter- and spring-run Chinook.

So, considering the Mokelumne fish are 100 percent vulnerable, I think this supports my opinion that there are likely population level impacts for Mokelumne Salmonids.

Next slide.

(Exhibit displayed on screen.)

WITNESS WORKMAN: So I'd like to close by offering some potential actions to address impacts to Juvenile Mokelumne Salmonids.

The existing and proposed protections put forth in the Biological Opinions offer no directed actions that would protect Mokelumne River Juvenile Salmonids specifically against WaterFix-caused exacerbation to Delta impacts based on their unique Delta migration route.

We recommend solidifying the Old and Middle River flow standards into an enforceable water right condition to provide some protections from further impacts.

We also propose that the Petitioners be directed to fund and implement studies to better address impacts to Mokelumne River fisheries and provide more Mokelumne-specific information into the

adaptive management process.

Studies like these have been performed to assess the impacts on both Sacramento and San Joaquin fishes, and based on this year's returns and in the context of Central Valley Salmon resiliency and the need for spatial diversity, the Mokelumne River has shown itself to be a strong hold worthy of directed protections to sustain the public trust throughout the Central Valley.

Thank you for your time.

MR. SALMON: And that concludes our direct examination.

CO-HEARING OFFICER DODUC: Thank you.

I will ask the Department: Is it going to be a joint Department and State Water Contractors?

MS. MORRIS: (Nodding head.)

CO-HEARING OFFICER DODUC: All right. Anyone else wishing to cross-examine this panel?

All right.

MS. MORRIS: So good afternoon. Stefanie Morris for the State Water Contractors.

And I have some questions for the panel. Both of them are largely the same.

Did you want me to give the overview?

CO-HEARING OFFICER DODUC: Please.

MS. MORRIS: Okay. About the basis of their opinions and the data provided in some of the modeling assumptions, if they're able to answer.

CO-HEARING OFFICER DODUC: All right. Oh, was there more?

MS. MORRIS: No.

CO-HEARING OFFICER DODUC: Okay.

MS. MORRIS: Also, just for the record sake, I am going to be referencing exhibits but because they're from the Biological Assessment and there is a lot of chapters with really long amounts of papers and it's hard to search, I've extracted them.

So I'm going to be referring to them in the way that Mr. Hunt can pull them up from my thumb drive. And I will tell you what they are and if you need us to go back, we can.

But I just wanted to let you know that if I say SETKA-1, it's really just so we can communicate to be more efficient, or try to be more efficient.

So I'll start with Mr. Setka.

CROSS-EXAMINATION BY

MS. MORRIS: Good afternoon.

WITNESS SETKA: Good afternoon.

MS. MORRIS: Your opinions are based on the conclusion that the Delta Cross Channel Gates will be

opened more frequently and for longer in the fall under the CWF; correct?

WITNESS SETKA: That is correct, based on what I was -- what I read in the Biological Assessment.

MS. MORRIS: Thank you.

And what months do you include in your use of the term "fall"?

WITNESS SETKA: Primarily October and November.

MS. MORRIS: Thank you.

And your opinion is that these additional Delta Cross Channel Gate openings will harm Mokelumne-origin fall-run Chinook Salmon; correct?

WITNESS SETKA: That they will provide false cues and lead to straying of those fish.

MS. MORRIS: I'm oversimplifying, so thanks for the clarification.

The basis of your understanding that the Delta Cross Channel Gates will be opened more frequently under the CWF as compared to the No-Action Alternative is based on the modeling; correct?

WITNESS SETKA: It's based on the information that was presented in the Biological Assessment of WaterFix released in 2016.

MS. MORRIS: And that information is -- is

based on modeling.

WITNESS SETKA: Yeah.

MS. MORRIS: Okay. On Lines -- On your testimony on Page 12, Lines 9 through 11, you're more specific that, based on the documentation associated with the Project, the Delta Cross Channel Gates would be open more frequently in October and November under WaterFix; correct?

MR. SALMON: Would it be possible to display the testimony?

WITNESS SETKA: I just want to make sure I'm reading the same line.

(Exhibit displayed on screen.)

MR. ETHRIDGE: Could you restate the question given the pause?

MS. MORRIS: Oh, sure. Happy to.

I'm looking at Page 12 of your testimony on Lines 9 through 11.

And here you are more specific that based on documentation associated with the Project, that the Delta Cross Channel Gates would be open more frequently in October and November under WaterFix; correct?

WITNESS SETKA: I mention -- In here, it says, "critical fall upmigration period."

MS. MORRIS: Okay. And then if we just look

down, I believe, in Line 12 --

WITNESS SETKA: Oh, okay.

MS. MORRIS: -- it says (reading):

". . . Open more under Project conditions during . . . October-November . . ."

Do you see that on your --

WITNESS SETKA: Correct. Correct, yes.

MS. MORRIS: Okay. Thank you.

And could you please pull up, Mr. Hunt, SETCA-1.

(Exhibit displayed on screen.)

MS. MORRIS: And this document is DWR-1143.

Do you see that this is a summary table of the CWF H3+ Operational Criteria?

WITNESS SETKA: Yes, that's what it's labeled as, "Operations Criteria."

MS. MORRIS: And directing your attention to the bottom of the page --

(Exhibit displayed on screen.)

MS. MORRIS: -- do you see that this was prepared at the request of the Hearing Officers in this proceeding?

WITNESS SETKA: Yes.

MS. MORRIS: And looking at the gray shaded area -- if you -- that's highlighted, do you see -- do

you see that shaded area?

WITNESS SETKA: Yes.

MS. MORRIS: And does that indicate that the criteria listed below on that table are new criteria for the Proposed Action?

WITNESS SETKA: That's what it says.

MS. MORRIS: And then turning to Page 6 of DWR-1143.

(Exhibit displayed on screen.)

MS. MORRIS: Do you see the shade -- the gray shaded area on this page, and towards the middle of the page, highlighted?

WITNESS SETKA: I do.

MS. MORRIS: And does that indicate that the criteria that are listed below are existing criteria and are not changing?

WITNESS SETKA: Yes.

MS. MORRIS: And the first criteria that's listed below that is the Delta Cross Channel Gates; correct?

WITNESS SETKA: That is correct.

MS. MORRIS: And in the table where it describes the criteria, it shows that the operating criteria for the Delta Cross Channel Gates are as required by the NMFS 2009 Biological Opinion Action

IV.1 and D-1641; correct?

WITNESS SETKA: That is correct.

MS. MORRIS: And that the DCC closure for downstream flood control will be based on the Sacramento River flow at Freeport, which is upstream of the North Delta diversion facilities; correct?

WITNESS SETKA: That is correct.

MS. MORRIS: Mr. Setka, did you review the WaterFix Biological Assessment?

WITNESS SETKA: Yes. Not in its entirety, but those sections related to my testimony, yes.

MS. MORRIS: Okay. Thank you.

The 20 -- July 2016 BA . . .

And if you could pull up SETKA-2, Mr. Hunt, please.

(Exhibit displayed on screen.)

MS. MORRIS: It also states that operations will continue as -- for Delta Cross Channel Gates as they are now operated under the NMFS 2009 Biological Opinion IV.1 and D-1641; correct?

WITNESS SETKA: It does say that, but these criteria are not necessarily related to the testimony I gave.

There are other factors that played into the Biological Assessment and the modeling conducted in

terms of the closures and openings that aren't necessarily related to things such as the Knights Landing Catch Index.

MS. MORRIS: Okay. Thank you.

But you agree that they're unchanged.

WITNESS SETKA: The current operating criterias are unchanged.

MS. MORRIS: Okay. And specifically for October and November, the closure decisions will be based on the existing real-time operation process; correct?

WITNESS SETKA: The --

MR. ETHRIDGE: Could we -- Could we define that term, the existing.

MS. MORRIS: Sure. If we want to -- I'm trying not to read from the document, but if you look at the highlighted version and you read that second highlighted version, it talks about existing real-time operations. And, again, this is document DWR-1142, which is the Biological Assessment Chapter 3, Page 3-114.

WITNESS SETKA: I'm not sure what the real-time operational decision-making process is, if there's something that exists like that right now.

MS. MORRIS: But based on your reading of this

document, of the Biological Assessment for this Project, isn't it clear that the -- there is an existing real-time operation and that it will continue in the future?

WITNESS SETKA: There is an existing -- There are existing criteria for operation of the DCC that are going to be the baseline for continuing in the future.

However, the modeling shows there could be additional changes to those operations, not necessarily criteria but based on conditions that those operations of the DCC may change.

MS. MORRIS: But isn't it true that modeling cannot necessarily show real-time operations?

And so -- Is that true?

WITNESS SETKA: Modeling is modeling. And that's been one of the issues throughout these hearings is that modeling shows one thing and then all we have now is basically that there will be a real-time operation scenario put in place.

MS. MORRIS: But --

WITNESS SETKA: I don't have that.

MS. MORRIS: Okay. But you would agree that, for example, if fish presence is a real-time operation that dictates a closure of the DCC, that a modeling exercise would not necessarily be able to replicate

that fish presence; correct?

WITNESS SETKA: If you're talking about the criteria for a Catch Index, let's say, at Knights Landing, yes, modeling will not be able to represent that.

MS. MORRIS: Well, my -- my question was more general.

Can you answer the question that I posed?

WITNESS SETKA: The que -- What is the -- Can you repeat the question, please.

MS. MORRIS: We'll have the court reporter very kindly read it back for me.

(Record read.)

WITNESS SETKA: Right. I think that's what I said.

MS. MORRIS: Okay.

WITNESS SETKA: I gave the example of the Knights Landing Catch Index, because that's one of the primary fish criteria that's used.

MS. MORRIS: Okay. And could we -- Mr. Hunt, could you please pull up SETKA-3.

And this it DWR-1142, which is the Biological Assessment, Chapter 3, Page 14.

Looking at that, isn't it that --

CO-HEARING OFFICER DODUC: Hold on.

MS. MORRIS: Oh, sorry.

CO-HEARING OFFICER DODUC: We don't have it.

MS. MORRIS: SETKA-3.

Could you go back? And then -- Oh, there seems to be an issue.

Okay. I apologize, Mr. Hunt. We're going to go on a -- We're going to have to pull it up. I don't know what happened.

So it's DWR-1142.

(Exhibit displayed on screen.)

MS. MORRIS: And it's Chapter 3.

(Exhibit displayed on screen.)

MS. MORRIS: And it is Page 3-114, so it should be roughly .pdf Page 115.

(Exhibit displayed on screen.)

MS. MORRIS: All right. Stop right there.

Okay. Thanks.

And if we could just look at the bottom paragraph.

(Exhibit displayed on screen.)

MS. MORRIS: I'm sorry. It's 3-14, not 3-114. My apologies.

(Exhibit displayed on screen.)

MS. MORRIS: I think it's -- Thank you.

And then can we just -- I could direct your

attention to that bottom paragraph, "The PA does not propose."

And my question is, isn't it true that the Proposed Action --

"The PA does not propose changing any of the existing real-time operational processes currently in place."

Correct?

WITNESS SETKA: That's correct. None of the criteria are changing.

MS. MORRIS: So that would also include the Delta Cross Channel operations -- real-time operations; correct?

WITNESS SETKA: The criteria for operations are not changing --

MS. MORRIS: Okay.

WITNESS SETKA: -- including closures -- criteria for closures.

MS. MORRIS: Okay. And if we could go to East Bay MUD-155, which is your testimony.

(Exhibit displayed on screen.)

MS. MORRIS: And looking at Page 16.

(Exhibit displayed on screen.)

MS. MORRIS: Lines 20 to 22.

(Exhibit displayed on screen.)

MS. MORRIS: In that -- In those pages, you cite to the NMFS Biological Opinion for WaterFix at Page 658; correct?

WITNESS SETKA: Correct.

MS. MORRIS: And you cite to that proposition for the fact -- for -- You cite to that for the proposition that the Delta Cross Channel Gates would be open more frequently under the Project Alternative; correct?

WITNESS SETKA: Correct.

MS. MORRIS: Proposed Action. I apologize.

Mr. Setka, did you look at the next page in the NMFS Biological Opinion, Page 659?

WITNESS SETKA: Can you show it? I have no -- I cannot recall if I looked at the next page or not.

MS. MORRIS: Can you pull up, Mr. Hunt, SETKA-4 which, again, this is an excerpt --

(Exhibit displayed on screen.)

MS. MORRIS: -- from State Water Resource Control Board Exhibit 106, Page 659.

Isn't it true that the Biological Opinion states that (reading):

". . . The increased opening seen in the modeling will not . . . occur during actual operations."

WITNESS SETKA: That's what it says, yes.

MS. MORRIS: Okay. And, Mr. Setka, the Delta Cross Channel Operational Criteria in October and November will remain the same as the existing real-time operations.

WITNESS SETKA: The criteria to operate will remain the same, but it's the factors that influence those criteria may change under operations.

MS. MORRIS: And I had "correct" in here so many times that I actually looked for synonyms of "correct" and the first one that popped up was "amen," which doesn't -- I don't think that would work in my questioning, but it is kind of funny.

Moving on.

Mr. Setka, you acknowledge that USBR historically closed the Delta Cross Channel Gates in October at the request of the Lower Mokelumne River Partnership; correct?

WITNESS SETKA: On one instance, they have, yes.

MS. MORRIS: And since the Operational Criteria that allowed for the closures are not changing, isn't it true such closure -- closures could also occur under CWF H3+?

WITNESS SETKA: Based on the modeling and

those operational changes that might occur, the criteria for closures will probably happen less often.

MS. MORRIS: But it could happen.

WITNESS SETKA: Sure.

MS. MORRIS: Okay. And, Mr. Setka, you claim that the WaterFix Biological Assessment did not include any analysis of Mokelumne River-origin Adult Salmonids; correct?

WITNESS SETKA: Correct.

MS. MORRIS: And, Mr. Hunt, if we could bring up SETKA-5.

(Exhibit displayed on screen.)

MS. MORRIS: Right.

And I'm going to direct you -- You can feel free to look at this, but I'm going to direct your attention to the last paragraph on the return of fall-run Chinook Salmon.

Isn't it true that the WaterFix Biological Assessment included an assessment of the effect of WaterFix -- WaterFix on returning Mokelumne River fall-run Salmon?

WITNESS SETKA: In my testimony, I stated that the -- the analysis used was inadequate and not complete, and that we had provided information that would have been more relevant to a stud -- or to an

analysis of this type, including things like returns, stray rates, coded wire tag recoveries, et cetera.

MS. MORRIS: So that wasn't my question. I hear -- I acknowledge -- My question was, you said it wasn't analyzed, and you said it wasn't, but, in fact, it was. It's just that you disagree with how it was analyzed; correct?

WITNESS SETKA: I don't know if I said it wasn't analyzed. I don't think -- I think I said it was inadequately analyzed.

MS. MORRIS: Okay. We'll move on.

But look -- moving -- looking at the same section, the Biological Assessment analysis or assessment shows that there's a higher proportionate contribution to the Delta by the eastern tributaries under the PA; correct?

Do you see that?

WITNESS SETKA: (Examining document.)

Yes.

MS. MORRIS: And greater proportion of flows from the east-side rivers will help prevent straying; correct?

WITNESS SETKA: Not necessarily, no.

MS. MORRIS: Okay. But the Biological Assessment analysis, if you were looking at that

section, it -- it does indicate that the greater inflow would help prevent straying; correct?

WITNESS SETKA: The Biological Assessment may say that. But, as I've mentioned, I don't believe it was the appropriate tool to use -- that is, the DSM-II-QUAL fingerprinting analysis -- when you actually have physical data both in terms of DCC opening and closures, flows for the -- both Cross Channel flows and the Mokelumne, and all of the return data that we've seen up and down the valley and in the Mokelumne.

MS. MORRIS: The Biological Assessment also acknowledges that the October closures have been tested and may be implemented in the same manner in the future; correct?

If you look at that same section.

Scroll down to the next page, Mr. Hunt, and that would be Page 5.E-87.

(Exhibit displayed on screen.)

MS. MORRIS: The last sentence of that paragraph.

WITNESS SETKA: You want to repeat your question one more time?

MS. MORRIS: The question was that the Biological Assessment also acknowledges that the

October closures that have been tested may be implemented in the future; correct?

WITNESS SETKA: Yes.

MS. MORRIS: Good afternoon, Miss Workman.

Your opinions are based largely, almost entirely, on increased pumping in the South Delta occurring from the CWF as compared to the No-Action Alternative; correct?

WITNESS WORKMAN: That's correct.

MS. MORRIS: And your analysis does not look at the modeling that includes CWF H3+ criteria; correct?

WITNESS WORKMAN: That's correct.

MS. MORRIS: It also doesn't include the assessment in the Revised Biological -- in the Revised Biological Assessment, which is labeled as DWR-1142; correct?

WITNESS WORKMAN: I reviewed DWR-1142 in prepare -- in preparation.

MS. MORRIS: And if you could pull up, please, Mr. Hunt, WORKMAN-1, and hopefully -- It looks like it might not have saved right.

Okay. We'll have to do this the hard way. Apologies.

It is DWR-1142.

CO-HEARING OFFICER DODUC: Hold on. I think --

MS. MORRIS: Oh, it did work.

CO-HEARING OFFICER DODUC: It did work, yes.

MS. MORRIS: Great. Fantastic.

Okay. This is DWR-1142, Appendix 5.A, Figure 5.A-6-27.7.

Do you see that the blue line -- Well, first, let's step back here for a second.

This figure shows South Delta exports under the No-Action Alternative and the PA; correct?

MR. SALMON: Objection: This -- The witness hasn't established whether she's seen this or is familiar with this.

MS. MORRIS: Actually, I -- This is from the Biological Assessment. I just asked her, and she said she reviewed it in preparation of her testimony.

WITNESS WORKMAN: So may I clarify?

CO-HEARING OFFICER DODUC: Please.

WITNESS WORKMAN: So I reviewed certain portions of the text in DWR-1142 mainly in relation to route entrainment and migration routing and those -- those issues.

And as we stated in opening, I did rely on Ben Bray for a lot of the modeling information, and so that

there might be --

MS. MORRIS: I can ask Mr. Bray or is it Dr. Bray? I can ask -- I'd be happy to ask Dr. Bray to answer this question for me.

Dr. Bray, this is from the Biological Assessment. Whether you've reviewed it or not, I'm positive that you're able to read CalSim modeling output; correct?

WITNESS BRAY: Yes, ma'am.

MS. MORRIS: And this figure is showing the -- the South Delta exports and, for each month, it's an exceedance chart.

Do you see that?

WITNESS BRAY: I need to ask a clarifying question at this point.

With respect to South Delta exports, I need to understand your definition here.

Is this combined north plus through and South Delta? Is that what is shown on this figure? Or is this showing only one of those --

MS. MORRIS: Yeah.

WITNESS BRAY: -- components.

MS. MORRIS: Happy to answer that question.

This is showing -- and we're going to establish this -- the No-Action Alternative and the PA

only for combined, so CVP and SWP South Delta exports.

This does not show anything from the new north diversion. It is simply combining South Delta exports.

WITNESS BRAY: So combined through and from the south.

MS. MORRIS: Yes.

WITNESS BRAY: Now, ask your question. I'm sorry.

MS. MORRIS: Sure.

The blue line is the No-Action Alternative; correct?

WITNESS BRAY: According to the chart, yes.

MS. MORRIS: And the red line is the Proposed Action, or PA; correct?

WITNESS BRAY: Correct.

MS. MORRIS: And, Miss Workman, you were particularly concerned about the months of March, April and May; correct?

WITNESS WORKMAN: Yes.

MS. MORRIS: And so my question to either one of you is:

Isn't it true that the South Delta exports in each of the months, including April, May -- I'm sorry -- March, April and May, are lower under the PA than they are under the No-Action Alternative?

WITNESS BRAY: Yes, that's what the charts show.

And as you can also see, this is very different than what we had shown under Boundary 1, Boundary 2, H3 and H4.

MS. MORRIS: Right. That's why I'm showing it because the Proposed -- Do you understand the Proposed Project is the Operational Criteria CWF H3+?

WITNESS WORKMAN: My understanding is that the Project can be operated all the way to the boundary conditions and includes CWF H3+ within those bounds.

MS. MORRIS: But you understand the initial operating criteria as dictated in the Biological Opinions that were issued for WaterFix are CWF H3+; correct?

WITNESS WORKMAN: I don't think that changes my answer I just gave. It's the same answer.

MS. MORRIS: It's a -- It's a different question.

WITNESS BRAY: And adaptive management is part of the Proposed Action.

MS. MORRIS: But the question was: The initial proposed operating criteria under the Biological Opinion issued for this Project are CWF H3+; correct?

WITNESS WORKMAN: That may be the initial proposed operating criteria, but it's been presented to this hearing panel that it can be operated within that entire range of bounds.

And, so, if I have to look at impacts to my system, then I need to look at the impacts that could possibly be operated to. I feel like that's my due diligence.

MS. MORRIS: Miss Workman, is it your opinion that the Project exports are the sole cause of mortality for outmigrating Mokelumne River fish?

WITNESS WORKMAN: No, but they exacerbate other existing conditions in the interior Delta.

MS. MORRIS: And, in your testimony, East Bay MUD-156, Page 3, Line 16.

(Exhibit displayed on screen.)

MS. MORRIS: I'm sorry. Page 3.

(Exhibit displayed on screen.)

MS. MORRIS: Looking at -- Directing your attention to Line 16, are you referring to diversions by the approximately 1800 unscreened diversions of the Delta in this -- in --

WITNESS WORKMAN: I do refer to those as additional impacts. When Juvenile Chinook are delayed in their migration and spend more time in front of

those diversions, that exacerbates the impact of those diversions on survival.

MS. MORRIS: And looking at Line 17, when you say "harmful water quality conditions in the interior Delta," are you referring to water quality impacts from ag return flows?

WITNESS WORKMAN: No. Generally speaking, things like water temperature, lack or overt high turbidity, just the gamut, but nothing specific.

MS. MORRIS: Okay. Thank you.

Again, looking at your testimony -- And I think it's easier to look at this Figure 2 in your presentation, East Bay MUD-105, Slide 7.

(Exhibit displayed on screen.)

MS. MORRIS: And I'll just confirm that this -- Oh. Do you have that up?

Okay. I'm just going to confirm that that is the Figure 2 you refer to in your testimony and is attached at the back of your testimony. It's the same figure; correct?

WITNESS WORKMAN: Yes, it is.

MS. MORRIS: Thank you.

In your testimony on about Figure 2 which compares salvage of all natural-origin fall-run -- I'm sorry. Strike that. Let's start over.

In your testimony, Figure 2 compares salvage of all natural-origin fall-run with fall-run from the Mokelumne River averaged across many years; correct?

WITNESS WORKMAN: That's correct.

MS. MORRIS: And looking at your testimony on Page 18, East Bay MUD-156.

(Exhibit displayed on screen.)

MS. MORRIS: Looking at Lines 13 to 14.

(Exhibit displayed on screen.)

MS. MORRIS: In drafting testimony on Page -- on Page 18, Lines 13 to 14, did you consider results of the Delta Passage Models in making this statement?

WITNESS WORKMAN: I did. I reviewed the Delta Passage Model fairly thoroughly.

MS. MORRIS: Okay. So you are familiar with the Delta Passage Model?

WITNESS WORKMAN: Yes.

MS. MORRIS: And then if, Mr. Hunt, could you please pull up WORKMAN-2.

(Exhibit displayed on screen.)

MS. MORRIS: This is DWR-1142, Appendix 5E, Page E.5.E-57.

Do you see the results for the Delta Passage Model for the Mokelumne River fall-run Chinook Salmon?

WITNESS WORKMAN: I did.

MS. MORRIS: Doesn't it show that, in all water year types, the PA is the same or no better than the No-Action Alternative?

WITNESS WORKMAN: It does. And the basis of my opinion is that I think the data that went into the Delta Passage Model does not adequately address Mokulmne River fishes.

MS. MORRIS: Okay. Your counsel can ask you about that on redirect. Thank you.

Miss Workman on Page 57 of East Bay MUD-156, you state that Figure 3 --

Do you want to have that up?

(Exhibit displayed on screen.)

MS. MORRIS: Sorry.

You state that Figure 3 -- which is also shown on East Bay MUD-105, Slide 5 -- shows that between 1992 and 2006, 332 coded wire tagged fish were captured in salvage or predation samples; is that correct?

WITNESS WORKMAN: Yes.

MS. MORRIS: Roughly how many coded wire tagged juveniles are released each year in-river, which I believe you refer to as "east" in your figure.

WITNESS WORKMAN: Yeah. Just one second. I do have numbers here.

So, for the period of 1992 to 2006 -- And I

did an average. So an average of 9 percent of the Mokelumne River production was tagged in those years, and that is approximately 26 million fish.

And then in the period of 20 -- 2007 to 2014, the mark rate went up to 31 percent overall because of the Constant Fractional Marking Program and a total release of 36 million fish.

MS. MORRIS: So, I'm sorry, in 1992 to 2006, it was 26 million fish?

WITNESS WORKMAN: Yes. And they're marked as a 9 percent mark rate.

MS. MORRIS: I think I'm almost done. I just want to follow up.

Mr. Hunt, if you could pull up East Bay MUD-105, Slide 16.

(Exhibit displayed on screen.)

CROSS-EXAMINATION BY

MR. MIZELL: Hello, Miss Workman.

So this question generally goes to Slide 16, 17, and 18 of your PowerPoint.

I'll ask you them one-by-one so that we don't have a compound question. Is that okay?

WITNESS WORKMAN: Fine.

MR. MIZELL: So on Slide 16, this is the graphic you use to discuss the South Delta diversion

rates.

And under Boundary 1, you indicated that it could go as high as 7,000 and be above the No-Action Alternative; is that correct?

Roughly speaking.

WITNESS WORKMAN: Well, I don't think it would go 7,000 above the No-Action. The difference between the No-Action and the upper bound of the B1 is the difference rate. So that looks about 4,000?

MR. MIZELL: Okay.

WITNESS WORKMAN: At the widest spot.

MR. MIZELL: Yes. I probably should rephrase.

Up until the rate of diversion of about 7,000 cfs, Boundary 1 seems to be above the No-Action Alternative in your graphic; is that correct?

WITNESS WORKMAN: That's what it shows, yes.

MR. MIZELL: Okay. If we go on to Slide 17, please.

(Exhibit displayed on screen.)

MR. MIZELL: And, again, roughly speaking here, up to the rate of diversion of about 7,000 cfs, Boundary 1 is above the No-Action Alternative in your graphic; is that correct?

WITNESS WORKMAN: That's correct.

MR. MIZELL: Okay. And if we go to Slide 18.

(Exhibit displayed on screen.)

MR. MIZELL: Similar question. But this time it appears that it's -- In your graphic, it's up to 6,000 cfs. It's above the No-Action Alternative?

WITNESS WORKMAN: Correct.

MR. MIZELL: Okay. If we could go to Slide 22, please.

(Exhibit displayed on screen.)

MR. MIZELL: So, Miss Workman, I'll assert to you that 7,000 cfs is roughly 198 cubic meters per second.

In this graphic on salvage, is 198 cubic meters per second on the low end of your results?

WITNESS WORKMAN: It --

MR. SALMON: Objection: The witness testified that those were not her results and that she adapted that figure from a study.

MR. MIZELL: If the witness adapted the figure for the purpose of supporting her testimony, I believe she can answer the question as to how 198 cubic meters per second relates to the salvage rate.

CO-HEARING OFFICER DODUC: To this figure, yes.

Mr. Herrick?

MR. HERRICK: I just want to make sure that --

The figure does reference cubic meters. But at the top it says, "export flow cfs," so I don't know if there's a confusion here or not.

I just want to make sure that's clear what rates we're talking about.

CO-HEARING OFFICER DODUC: So let's hear the question again, Mr. Mizell.

MR. MIZELL: Yes.

So I ran the conversion in my handy dandy little phone here, and I'm asserting to you that 7,000 cfs is roughly 198 cubic meters per second.

And is 198 cubic meters per selected on the low end of these results?

WITNESS WORKMAN: Yeah. To -- To clarify that, in the publication, this is a misprint and the top, that export flow is in thousandths of cfs. So you can -- we can actually look at 7,000 there on the graphic, I think.

In any case, it's in the -- the middle to low range of this graphic, yes.

MR. MIZELL: Thank you.

No more questions with.

CO-HEARING OFFICER DODUC: All right. Any redirect?

MR. ETHRIDGE: Yes, we will have some

redirect.

CO-HEARING OFFICER DODUC: You want a little bit of time to confer?

MR. ETHRIDGE: That would be helpful.

CO-HEARING OFFICER DODUC: All right. Why don't we take a short break, and we will return at 2:40.

MR. ETHRIDGE: Great. Thank you.

(Recess taken at 2:27 p.m.)

(Proceedings resumed at 2:40 p.m.:)

CO-HEARING OFFICER DODUC: All right. It is 2:40. We are back in session.

Redirect, Mr. Etheridge, Mr. Salmon?

MR. ETHRIDGE: Yes. I have a few questions, and I believe Mr. Salmon does as well.

We'll begin with some questions for Mr. Setka.

REDIRECT EXAMINATION BY

MR. ETHRIDGE: Mr. Setka, you were asked on cross-examination about the United States Bureau of Reclamation closing the Delta Cross Channel on one occasion in 2011; is that correct?

WITNESS SETKA: That's correct.

MR. ETHRIDGE: Isn't it true that the Bureau did not close the Delta Cross Channel despite being requested to do so by the California Department of Fish

and Wildlife and United States Fish and Wildlife Service in 2009 and 2010?

WITNESS SETKA: Correct.

MR. ETHRIDGE: And that, in fact, is referred to on Page 10 of your testimony summary that you presented earlier today; is that right?

WITNESS SETKA: Correct.

MR. ETHRIDGE: So just because the Bureau could exercise its discretion to close the Delta Cross Channel, in the critical fall of migration months of October and November, that doesn't mean it will close the Delta Cross Channel; is that correct?

WITNESS SETKA: That's correct.

MR. ETHRIDGE: Thank you.

Are you comfortable leaving it to the Bureau's discretion to close the Delta Cross Channel in the fall?

WITNESS SETKA: No.

MR. ETHRIDGE: Is it your opinion that the Mokelumne River fall-run Chinook Salmon would be better protected from California WaterFix Project impacts if there were a required condition that the Delta Cross Channel be closed for periods in the fall?

WITNESS SETKA: Yes.

MR. ETHRIDGE: And is that why your testimony

includes a recommended condition that be included in the water rights of Petitioners if this Project is approved?

WITNESS SETKA: Yes.

MR. ETHRIDGE: Thank you.

And one last question, and this has to do with flows in the Delta and DCC closure criteria.

With changed flows in the Delta as a result of the Project, even if the Delta Cross Channel closure criteria remained the same, in the real world, might the Delta Cross Channel be open more under the Project than without it?

WITNESS SETKA: Yes.

The modeling results that show the Cross Channel being open more often do not have to do necessarily with fish indices. They have to do with flow conditions within the Sacramento River, primarily.

And there are a number of criteria that are used, in D-1641 and other operational guidelines, that would result in closed DCC. For instance, the flood control facility scour flow of 25,000 cfs, that would require a closure of the DCC.

In the modeling description of why they saw the results that they did see in terms of additional -- or reduced closures is that that 25,000 cfs standard

happens less often according to the modeling due to Project operations.

Likewise, there's also salinity control requirements and water quality control requirements within various Delta stations that the DCC is operated to, typically to improve or bring above a certain threshold. Again, that doesn't have to do with fish.

But those conditions could also change under operations -- modeled operations of the Project Alternative which, again, within the Biological Assessment, that's how they describe the reasoning why we're seeing differences between the No-Action and the Project Alternative.

MR. ETHRIDGE: Okay. Thank you.

Mr. Salmon, do you have some questions for the panel?

MR. SALMON: I do.

REDIRECT EXAMINATION BY

MR. SALMON: First question IS for Dr. Bray.

Dr. Bray, when Ms. Workman was under cross-examination, it was mentioned by Ms. Morris that H3+ is now the Project being proposed.

Dr. Bray, was H3+ modeling available to East Bay MUD and to the parties in this case other than Petitioners at the time we prepared the testimony for

Part 2 of this case?

WITNESS BRAY: CWF H3+ was not available and was submitted as part of the Petitioners' case in chief for Part 2 at the same time our submission was due.

MR. SALMON: Thank you.

And, Dr. Bray, you're not aware of any terms or conditions proposed by Petitioners in this hearing relating to the approval of their Water Right Change Petition that would permanently limit their operations to the H3+ criteria; is that correct?

WITNESS BRAY: That's correct. I'm not aware of any such Permit terms proposed by Petitioners.

MR. SALMON: Ms. Workman, the same question for you.

Are you aware of any proposal by Petitioners in this hearing to permanently limit the operations of the WaterFix Project to the H3+ initial operating criteria?

WITNESS WORKMAN: No, I'm not.

MR. SALMON: Thank you.

Can we please display the exhibit used in cross-examination labeled WORKMAN-2.

(Exhibit displayed on screen.)

MR. SALMON: Now, Ms. Workman, you were asked about this table.

And can -- It was represented to you as summarizing the results from the Delta Passage Model of Mokelumne River through-Delta survival by water year type; is that correct?

WITNESS WORKMAN: Yes.

MR. SALMON: In your opinion, does the Delta Passage Model do an adequate job of representing through-Delta survival of Mokelumne Salmonids?

WITNESS WORKMAN: No, it does not.

MR. SALMON: Why does it not do an adequate job?

WITNESS WORKMAN: There are a number of reasons in my analysis of the inputs to the Delta Passage Model.

One, the Delta Passage Model used as the basis for the simulations, the same data as in Perry 2010 that I cited in my testimony.

Those were late-fall fish released in the Sacramento River in December. So those fish are larger than Mokelumne fish so, hence, they have a better swimming capability, better able to avoid predation.

Also, releases in December I don't think can do a very good job of mimicking conditions in the Delta in April and May. The water temperatures are cooler; predatory activity is lower. I would assume diversion

rates, smaller diversions within the Delta are probably less.

And, then, in actually running the simulations, if the DCC Gates are closed, there's no ability to develop a -- a survival estimate or a detection probability in the Mokelumne forks because the model sets that number to zero because no fish from the Sacramento can use that DCC route.

So what they did in the Delta Passage Model was, they combined the Georgiana Slough and DCC routes as one parameter for estimation. So that doesn't adequately represent Mokelumne fish because Mokelumne fish are not using the Georgiana Slough.

And in those Perry 2010 releases, the Cross Channel Gates were open for the first 10 days of the release, so they do have some data of fish using the Cross Channel.

But what I read was, the travel time estimates were based on an N of five. And so most of the data used to generate these survival probabilities for that Reach in the Delta Passage Model must be based on fish using the Georgiana Slough because the Cross Channel Gate was closed the rest of the time.

MR. SALMON: In your opinion, does this result from the Delta Passage Model give you comfort that if

the WaterFix Project is constructed and approved as proposed, that through-Delta survival of Mokelumne Salmonids would not be impacted negatively?

WITNESS WORKMAN: It does not give me any confidence about any conclusions about Mokelumne River fisheries at all.

MR. SALMON: And is that because of all the deficiencies and problems with the Delta Passage Model with respect to Mokelumne River fisheries that you just identified?

WITNESS WORKMAN: Yes.

MR. SALMON: Thank you.

Can we please show Slide -- pardon -- Exhibit EBMUD-105.

(Exhibit displayed on screen.)

MR. SALMON: At Slide 17.

(Exhibit displayed on screen.)

MR. SALMON: Okay. I believe Mr. Mizell asked you about this slide and mentioned 7,000 cfs to you; is that correct?

WITNESS WORKMAN: Yes, he did.

MR. SALMON: Okay. Thanks.

Just a moment.

Okay. Slide 22, please.

(Exhibit displayed on screen.)

MR. SALMON: So Mr. Mizell mentioned that 7,000 cfs correlates to, I believe he said, 198 cubic meters per second.

But then you mentioned -- you clarified that the top axis actually is thousand cubic feet per second; correct?

So that we could directly identify on this chart a given flow in thousands of cfs?

WITNESS WORKMAN: Correct.

MR. SALMON: And would you say about this chart -- would you agree that it shows the -- a general trend of increasing export flows from the South Delta having a correlation with increasing percent salvage of Chinook?

WITNESS WORKMAN: Yes. It's not a linear relationship but there is definitely a relationship.

MR. SALMON: And does this chart show, in your opinion, that that relationship holds at all levels of export flow?

In other words, that, whether you're looking at the left side or the right side of this -- of this chart, the increase in export flow correlates with an increase in percent salvage; is that correct?

WITNESS WORKMAN: That's correct, in my reading of this.

MR. SALMON: Thanks.

And this chart came from a 2008 study; is that correct?

WITNESS WORKMAN: It was published in 2008. I assume the data was collected a few years before that.

MR. SALMON: So this represents a pre-WaterFix effort that collected data based on the world as it existed prior to WaterFix; is that correct?

WITNESS WORKMAN: That's correct.

MR. SALMON: Therefore, if WaterFix is constructed, would it be possible that the specific position on the chart at a given export flow -- pardon.

The specific salvage rate for a given export flow if WaterFix is built may look different than it did in 2008 when this study was published?

WITNESS WORKMAN: It may look different.

MR. SALMON: And . . . And yet you would -- Even if it would look different, you would still expect the same trend, that export flow increases are -- would correlate with increases in percent salvage.

CO-HEARING OFFICER DODUC: Hold on. I see Miss Morris running for the microphone.

MS. MORRIS: Just object that this is outside the scope of the cross-examination.

The cross-examination did ask about this

chart. But what is happening now is, the questioner is asking for speculation about how this chart may change with WaterFix in place, which was not asked about in cross-examination.

CO-HEARING OFFICER DODUC: Mr. Salmon.

MR. SALMON: Mr. Mizell asked our witness -- Well, he used this chart -- or he seemed to use this chart to imply that the -- at the level of export flow involved, that the percent salvage -- you know, he was using it to make a showing about that.

And so I'm asking whether, in fact, in a WaterFix world, a world where WaterFix exists, what this chart means since that's how he was trying to use it himself.

CO-HEARING OFFICER DODUC: Miss Morris.

MR. MIZELL: Just a quick response.

Mr. Mizell used this chart to ask a question about what the threshold would be based on this witness' testimony, not on WaterFix or a hypothetical situation with WaterFix in place.

I still believe it's outside the scope.

CO-HEARING OFFICER DODUC: I'll sustain the objection.

MR. SALMON: Okay. Well, I -- Yeah, I'm done.

CO-HEARING OFFICER DODUC: Recross.

MS. MORRIS: Very briefly.

RECROSS-EXAMINATION BY

MS. MORRIS: Mr. Setka, doesn't NMFS and the DOSS have significant say in Delta Cross Channel operations?

WITNESS SETKA: I don't know about "significant."

The -- They deal with Salmon and Sturgeon, but they're dealing primarily with Sacramento Basin fish. They don't consider Mokelumne, they don't get numbers from the Mokelumne, or anything like that.

MS. MORRIS: But my question was: They provide input --

WITNESS SETKA: They provide input, absolutely.

MS. MORRIS: -- to the Bureau on Delta Cross Channel operation.

WITNESS SETKA: Yes.

MS. MORRIS: Thank you.

And, Mr. Setka, you testified that the Delta Cross Channel closures -- you acknowledge that they would be based on Sac flow upstream of the intakes; correct?

One of the triggers?

WITNESS SETKA: One of the triggers I

mentioned was the flow -- flood scour flow which is at 25,000 cfs.

MS. MORRIS: Okay.

WITNESS SETKA: Trigger.

MS. MORRIS: And would you agree that a 25,000 cfs flow at Freeport in October and November are typically there when there are high unregulated flows from the upstream tributaries and not reservoir releases; correct?

WITNESS SETKA: Yes.

MS. MORRIS: So, with that in mind, it's true -- isn't it true that WaterFix operations, which would potentially include releases of reservoirs, are really not at play in that scenario; correct?

WITNESS SETKA: That's not what the modeling says.

MS. MORRIS: Okay. Dr. Bray, was the BA H3+ modeling available prior to your testimony being submitted?

WITNESS BRAY: That's a good question.

The BA modeling was released February 2016.

The Part 1 hearing modeling was released May of 2016 subsequently.

In Part 1, there was considerable . . . controversy around the modeling as an exhibit.

Eventually, DWR did submit DWR-500 as a rebuttal exhibit, which was the modeling package for Part 1.

CO-HEARING OFFICER DODUC: So I'm --

WITNESS BRAY: That was Boundary 1.

CO-HEARING OFFICER DODUC: -- confused. What was the question again, Miss Morris?

MS. MORRIS: My simple question was: Isn't it true that the BA H3+ modeling was made -- it was publicly available before the testimony for Part 2 was submitted.

CO-HEARING OFFICER DODUC: H3+.

MS. MORRIS: BA H3+.

WITNESS BRAY: And the point I'm -- I was trying to get to was, that was not an exhibit the Petitioners submitted in Part 1.

MS. MORRIS: But --

WITNESS BRAY: The --

MS. MORRIS: -- it was publicly available; correct.

WITNESS BRAY: Correct.

MS. MORRIS: And you -- you had access to it.

WITNESS BRAY: Correct.

MS. MORRIS: I have no further questions.

CO-HEARING OFFICER DODUC: Thank you.

And does that conclude EBMUD's case in chief?

MR. SALMON: It does.

CO-HEARING OFFICER DODUC: Do you wish to move your exhibits into the record?

MR. SALMON: Yes, we do.

Shall I read them back?

CO-HEARING OFFICER DODUC: Please.

MR. SALMON: Okay. We would like to move the following exhibits into the record:

EBMUD-104, -105, -129, -130, -155, -156, -157, -182, -183 and -184.

And I believe Dr. Bray's Statement of Qualifications is already submitted into evidence, so I will not do that a second time.

CO-HEARING OFFICER DODUC: Are there any objections?

Not hearing any, your exhibits have been moved into the record.

(East Bay Municipal Utilities District's Exhibits EBMUD-104, EBMUD-105, EBMUD-129, EBMUD-130, EBMUD-155, EBMUD-156, EBMUD-157, EBMUD-182, EBMUD-183 & EBMUD-184 received in evidence)

MR. SALMON: Thank you.

CO-HEARING OFFICER DODUC: Thank you. And

thank you all for attending.

WITNESS WORKMAN: Thank you.

CO-HEARING OFFICER DODUC: All right. Quick housekeeping matter before we adjourn. We might even get out here by 3:00. Let's see how fast I can talk.

Grassland. We will begin Monday with Grassland's final witness Dr. Petrie. I expect that -- At least I recall there was not a lot of cross-examination for Dr. Petrie, or am I wrong?

MS. ANSLEY: We believe no more than 20, 30 minutes.

CO-HEARING OFFICER DODUC: Okay.

MS. ANSLEY: And we will look at it over the weekend again.

CO-HEARING OFFICER DODUC: All right. What about cross-examination for San Joaquin Tributary Authority, Dr. Paulsen and Daniel Steiner?

MS. ANSLEY: I'm going to say 30 to 40, just because of witness answering. I think it might be a little shorter than that, but just from my experience.

CO-HEARING OFFICER DODUC: And then Dr. Paulsen for City of Antioch?

MS. ANSLEY: I do not have an accurate cross-examination estimate for Antioch at this time, although I know that our cross is not very extensive.

So I know that it's less than an hour if that helps. I know other parties aren't here.

CO-HEARING OFFICER DODUC: I'm just trying to sort of --

MS. ANSLEY: Yeah.

CO-HEARING OFFICER DODUC: -- have a brief idea of who we might get to on Monday so that they'll be prepared.

How about City of Stockton?

MS. ANSLEY: Again, I know that it's not more than an hour for the Department of Water Resources.

CO-HEARING OFFICER DODUC: And --

MS. ANSLEY: And it could likely be less. I just -- I'm trying be conservative here while we pull together notes.

CO-HEARING OFFICER DODUC: And Dr. Denton from Contra Costa?

MS. ANSLEY: That would be -- That would be -- That would be the same. I know that it's not more than an hour. I suspect it's closer to 30 -- 30 to 40 minutes.

CO-HEARING OFFICER DODUC: All right. And County of Sacramento, Mr. or Ms. Moghissi.

MS. ANSLEY: That one, I know is no more than 30 minutes. It's likely on the order of 20.

CO-HEARING OFFICER DODUC: All right. It might look like we'll be moving fairly quickly on Monday.

Actually, there'll be -- yes -- potential other cross-examination.

And I believe we are also going to be taking a later longer lunch in order to have a closed session as well.

CO-HEARING OFFICER MARCUS: I didn't know there was a closed session.

CO-HEARING OFFICER DODUC: Read your e-mail.

(Laughter.)

MS. ANSLEY: And that would be on Monday.

CO-HEARING OFFICER DODUC: Yes, that would be on Monday.

So I don't believe we will get to CSPA, but we might move fairly quickly through the rest, again, depending on -- Because right now, I'm looking at one, two, three, perhaps four hours of cross-examination just by DWR for all the various groups that I have named.

MS. ANSLEY: And it's likely less. I'm just trying to account for how witnesses may answer and, you know, movement between parties doing cross, so yes, I think that's accurate.

CO-HEARING OFFICER DODUC: I wish Miss Meserve were here to do reconnaissance for me.

Any idea, Mr. Herrick, since you're the only other non-Petitioner party out there, in terms of cross-examination by Protestants?

MR. HERRICK: Not much. I -- South Delta parties would have anywhere from 15 minutes to a half hour on the groups that you listed.

I do assume that there are others that will have at least a half hour on each one of those, too, so . . .

CO-HEARING OFFICER DODUC: All right. So why don't we say this: Given that we will have closed session, given that it will be a Monday, if we can get through to the County of Sacramento, we will stop there and we will not expect CSPA to begin until we resume on Tuesday; right?

Are we meeting all next week? I be --

MR. SALMON: All but Friday.

CO-HEARING OFFICER DODUC: All except Friday, correct.

So let's -- let's plan on going with that. And I believe we will be in Coastal the entire week.

So, with that, unless there's anything else, thank you all.

Have a good weekend.

(Proceedings adjourned at 3:02 p.m.)

State of California)
)
County of Sacramento)

I, Candace L. Yount, Certified Shorthand Reporter for the State of California, County of Sacramento, do hereby certify:

That I was present at the time of the above proceedings;

That I took down in machine shorthand notes all proceedings had and testimony given;

That I thereafter transcribed said shorthand notes with the aid of a computer;

That the above and foregoing is a full, true, and correct transcription of said shorthand notes, and a full, true and correct transcript of all proceedings had and testimony taken;

That I am not a party to the action or related to a party or counsel;

That I have no financial or other interest in the outcome of the action.

Dated: March 30, 2018

_____
Candace L. Yount, CSR No. 2737