BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

CALIFORNIA WATERFIX WATER RIGHT CHANGE PETITION HEARING	)))

JOE SERNA, JR. BUILDING

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

BYRON SHER AUDITORIUM

1001 I STREET

SECOND FLOOR

SACRAMENTO, CALIFORNIA

TUESDAY, APRIL 25, 2017

9:00 A.M.

PART 1 REBUTTAL

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Reported by: Megan Alvarez, RPR, CSR No. 12470
Certified Shorthand Reporter

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:

Diane Riddle, Environmental Program Manager
Dana Heinrich, Senior Staff Attorney

PART I

For Petitioners:

California Department of Water Resources:

James (Tripp) Mizell, Esq.
Thomas M. Berliner, Esq.

INTERESTED PARTIES:

State Water Contractors:

Stefanie Morris, Esq.

California Water Research:

Deirdre Des Jardins, Esq.

San Luis & Delta-Mendota Water Authority:

Rebecca R. Akroyd, Esq.

The Sacramento Valley Group:

David Aladjem, Esq.

Sacramento County Water Agency:

Aaron Ferguson, Esq.

INTERESTED PARTIES (Continued):

East Bay Municipal Utility District:

Fred Etheridge, Esq.

For Brett G. Baker, Local Agencies of the North Delta, Bogle Vineyards/Delta Watershed Landowner Coalition, Diablo Vineyards and Brad Lange/Delta Watershed Landowner Coalition, Stillwater Orchards/Delta Watershed Landowner Coalition, Islands, Inc., SAVE OUR SANDHILL CRANES and Friends of Stone Lakes National Wildlife Refuge, City of Antioch:

Osha Meserve, Esq.

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

Thomas H. Keeling, Esq.

San Joaquin Tributaries Authority, The (SJTA), Merced Irrigation District, Modesto Irrigation District, Oakdale Irrigation District, South San Joaquin Irrigation District, Turlock Irrigation District, and City and County of San Francisco:

Tim Wasiewski, Esq.

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.

Biggs-West Gridley Water District (BWGWD), Glenn-Colusa Irrigation District (GCID):

Andrew M. Hitchings, Esq.

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

Meredith Nikkel, Esq.

I N D E X

APRIL 25, 2017 - TUESDAY 9:00 A.M.

P R O C E E D I N G S

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CO-HEARING OFFICER DODUC: Good morning, everyone. Please take your seats.

It is 9:00 o'clock. Welcome back to the hearing on the water right change petition for the California WaterFix project.

I am Tam Doduc, board member and co-hearing officer. To my right, board chair Felicia Marcus and co-hearing officer. To the chair right, board member DeeDee D'Adamo. To my left, Dana Heinrich, Diane Riddle, and Kyle Ochenduszko. We'll also be assisted by Ms. McCue and Mr. Baker.

As you know, we're here on the matter of the water right change petition. Petitioners, the California Department of Water Resources and the U.S. Department of Interior, have requested to add points of diversion or rediversions to water rights held by the Department of Water Resources and the Bureau of Reclamation.

Since it's been a while, let's begin by refreshing our memory of pregeneral announcement.

First, please, look around and identify the exit closest to you. In the event of an emergency or

drill, the alarm will sound and we will evacuate this room. Please take the stairs, not the elevators, down to the first floor and exit to the park across the street.

If you're not able to use the stairs, please flag down one of the staff and you'll be directed to a protected area.

Secondly, this hearing is being Webcasted and recorded, and we do have a court reporter here with us as well. So please speak into the microphone when providing your statements and identify yourself and your affiliation as you begin.

The court reporter, as I said, is here, and the transcript for the hearing will be made available as soon as possible after the conclusion of Part I. If you need to have it sooner, please make your own arrangements with the court reporting service.

And my favorite announcement and the most important announcement, please take a moment and make sure that all noise-making devices are on silent or vibrate. Even if you believe they are, please take a moment and check. All right.

With that, I have a pretty lengthy procedural script to read. So please bear with me.

In mid-December, we concluded Part I-B of the

hearing after parties, others than petitioners, who are participating in Part I presented their cases in chief.

Beginning today, the petitioners and other parties participating in Part I will have an opportunity to summarize their written rebuttal testimony. Cross-examination of the witnesses by other parties will follow.

Only parties who submitted a notice of intent to appear in Part I, in accordance with the hearing notice and now subsequent rulings, may participate in this portion of the hearing.

Rebuttal evidence is limited to evidence that is responsive to evidence presented in connection with another party's case in chief, and it does not include evidence that should have been presented during the case in chief of the parties submitting the rebuttal evidence. It also does not include repetitive evidence.

(Cell phone sounding.)

CO-HEARING OFFICER DODUC: And that is a dirty look from the hearing officer at Ms. McCue.

All right. This hearing is being held in accordance with the October 30th, 2015, notice of petition and notice of public hearing and prehearing conference and subsequent revised notices and rulings addressing various procedural issues.

Any objections to the admissibility of rebuttal testimony that we did not address in our April 13th, 2017, ruling and any objections to the admissibility of rebuttal exhibits must be made either orally or in writing during the hearing when testimony and exhibits are offered into evidence or earlier.

I will now describe the order of proceeding for the rebuttal phase.

The presentation of each party's rebuttal evidence will begin with a brief opening statement, if so desired, followed by oral summary of rebuttal testimony and cross-examination. That oral summation should be very concise.

In addition, we may allow redirect examination upon a showing of good cause and recross examination.

After each party's rebuttal witnesses have been subject to cross-examination and any redirect examination and recross examination, the party should move to have the rebuttal testimony and exhibits accepted into the evidentiary record.

I mentioned opening statements earlier. Parties presenting rebuttal testimony will be allowed five minutes to present an opening statement, if they so wish, prior to their rebuttal testimony.

Opening statements should briefly summarize

the party's position and what the party is here to establish with its rebuttal evidence.

When called to testify, witnesses should begin by stating whether they have taken the oath, which I will administer if they testify -- which I will administer before they testify if necessary.

Witnesses should then proceed to identify their written rebuttal testimony as their own and affirm that it is true and correct. I will emphasize, again, that witnesses should summarize the key points in their written testimony and should not read their written testimony into the record.

When admitted into evidence, the written testimony will be part of the hearing record and we will rely on -- sorry -- part of the hearing record that we will rely on in forming our decision. So it is not necessary to read the testimony into the record during the hearing.

Pursuant to our prior rulings, the oral summary of written rebuttal testimony is limited to 15 minutes per witness. Each party may distribute their total allotted time among their witnesses as they deem appropriate.

For example, the petitioners are offering 17 rebuttal witnesses. They will have four hours and

15 minutes to summarize their rebuttal testimony. They may use this time however they wish, but shall not have more time without good cause and our approval.

With the exception of Dr. Susan Paulson, who submitted different testimony on behalf of two different parties, witnesses representing more than one party will not be allowed more than 15 minutes by the virtue of the fact they were presenting more than one party.

Again, we expect the parties to adhere to the time limits unless we approve an extension.

Moving on to cross-examination, rebuttal testimony will be followed by cross-examination by the other parties, and then, if necessary, followed by questions from board members and the hearing team.

Parties will cross-examine witness panels one panel at a time. Please note that unlike cross-examination of a party's direct testimony, the scope of cross-examination on rebuttal is limited to the scope of the witness's rebuttal testimony.

Repeat that: The scope of cross-examination on rebuttal is limited to the scope of a witness rebuttal testimony.

Each party will be limited to one hour of cross-examination per witness or panel of witnesses. We may allow additional time for cross-examination if there

is good cause demonstrated in an offer of proof. We expect, however, that parties will be efficient in their cross-examination.

Moving on to redirect testimony and recross.

After completion of rebuttal testimony and cross-examination, we may permit redirect testimony and recross-examination upon a showing of good cause. Any recross-examination will be limited to the scope of redirect testimony. We may impose time limits for redirect and recross-examination later in the hearing.

Surrebuttals. As stated in our recent ruling, we will permit surrebuttal testimony and exhibits to be presented upon a showing of good cause.

Consistent with our usual practice with respect to rebuttal, surrebuttal will begin immediately after all parties have presented their rebuttal testimony and the witnesses have been cross-examined.

Surrebuttal testimony and exhibits will not be required to be submitted in advance.

Any surrebuttal testimony or exhibits must be responsive to the evidence submitted during rebuttal. Surrebuttal does not include evidence that should have been presented during the case in chief or rebuttal of the party submitting surrebuttal evidence. It also does not include repetitive evidence.

Cross-examination of surrebuttal witnesses will be limited to the scope of their surrebuttal.

All right. Let's talk about the order of rebuttal testimony, et cetera.

Parties will present their rebuttal in the order provided in Attachment B of our April 13, 2017, ruling. There are additional copies of Attachment B at the front of the room.

Parties will conduct cross-examination and any recross-examination in the same order as in Part I. Unless we approve changes, the order of presentation of surrebuttal will be the same as for cross-examination.

Unless any party objects, I will skip reading of the list of parties who are presenting rebuttal testimony, but I will ask that you speak up now if there are any errors to Attachment B.

Does anyone have any?

Oh, are you just grabbing Attachment B?

MS. McCUE: Same attachment in the recent ruling, modified Attachment A and B.

CO-HEARING OFFICER DODUC: All right. Let's go ahead and move on then.

Again, we encourage all parties to be efficient in presenting their oral testimony and in conducting their cross-examination.

Except where Co-hearing Officer Marcus or I approved a variation, we will follow the procedures set forth in the board's regulation, the hearing notice, and our rulings.

All right. Before we begin, there are a couple of procedural housekeeping items we need to address.

DWR's motion for a protective order seeking to vacate North Delta Water Agency's notice requesting the appearance of a DWR witness and production of documents remain pending. We plan to issue a ruling taking action on DWR motion later this week.

I also want to take this opportunity to remind all the parties that during this proceeding, ex parte communications with State Water Board members or the State Water Board hearing team staff and supervisors regarding substantive or controversial procedural issues within the scope of the proceedings are prohibited.

Any communications regarding substantive or potentially controversial procedural matters must include a statement of service demonstrating that all parties were served and the manner of service.

Parties, however, are free to communicate with each other without having to notify all of the other parties.

And then one final announcement. Unless we specify otherwise during the course of the hearing, the starting time after today for Part I rebuttal will be 9:30 a.m.

And for planning purposes, by starting at 9:30 a.m., I don't anticipate taking a morning break. We will go until noon or shortly thereafter and take our lunch break.

All right. Before we get to the petitioner's witnesses, does anyone have other procedural matters or requests that need to be addressed?

Mr. Bezerra?

MR. BEZERRA: Thank you. Ryan Bezzera for City of Folsom, Roseville, San Juan Water District.

Just a quick question: In terms of the time for cross-examination, I want to clarify something because the instruction is a little unclear.

It says: "Cross-examiners will be limited to one hour per witness or panel of witnesses." The panels vary in size dramatically, and so I assuming that you'd like us to try to stick to one hour per panel, but we can make an offer of proof to start with.

CO-HEARING OFFICER DODUC: That's correct.

MR. BEZERRA: I think --

CO-HEARING OFFICER DODUC: I appreciate that.

Petitioners Panel 2 consists of --

MR. BEZERRA: Eight or nine witnesses. So I suspect you may see a fair number of presentations of good cause for some panels.

Thank you.

CO-HEARING OFFICER DODUC: Okay. There had better be very good cause though, Mr. Bezerra.

MR. BEZERRA: We will certainly attempt to present very good cause.

CO-HEARING OFFICER DODUC: Anyone else with questions?

All right. In that case, I will ask petitioners to bring their Panel 1 up.

Let me start by addressing the oath. Witnesses who have already taken the oath during Part I-A or I-B may either take it again or simply confirm, when you begin your testimony, that you have taken the oath.

Is there any witness from the panel who has not taken the oath? If so, please stand and raise your hand.

Seeing no one. Right?

With that, then, I will turn it over to Mr. Mizell and Mr. Berliner.

Do you wish to make an opening statement?

MR. MIZELL: Not at this time.

CO-HEARING OFFICER DODUC: All right. Then please begin with your Panel 1 witnesses.

JOHN BEDNARSKI

SHANMUGAM PIRABAROOBAN

SERGIO VALLES

GWEN BUCHHOLZ

called as a witness by the Petitioners, having been previously duly sworn, were examined and testified as follows:

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DIRECT EXAMINATION

MR. MIZELL: Thank you.

The witnesses you have before you have appeared before you before: Mr. Bednarski, Mr. Valles, Mr. Pirabarooban, and Ms. Buchholz. And I'll just have them attest to their rebuttal testimony, and then we will turn it over for their summary.

Mr. Bednarski, is DWR-75 a true and correct copy of your rebuttal testimony?

WITNESS BEDNARSKI: Yes, it is.

MR. MIZELL: Mr. Valles, is DWR-76 a true and correct copy of your rebuttal testimony?

WITNESS VALLES: Yes, it is.

MR. MIZELL: Mr. Pirabarooban, is DWR-77 a

true and correct copy of your rebuttal testimony?

WITNESS PIRABAROOBAN: Yes, it is.

MR. MIZELL: And, Ms. Buchholz, is DWR-80 a true and correct copy of your rebuttal testimony?

WITNESS BUCHHOLZ: Yes, it is.

MR. MIZELL: Thank you.

At this time, I'll let Mr. Bednarski summarize his written testimony and he'll pass the mic off to Ms. Buchholz when he's finished.

WITNESS BEDNARSKI: Thank you.

Could I get DWR-6 errata and then the second page of that? It's a summary slide.

We recognize that we have short time, so I'll be brief and to the point.

My written testimony was organized and summarized under the heading shown on this slide. My oral testimony today summarizes our written testimony as follows: Testimony before this board has suggested that the WaterFix tunnels are unproven design and construction methods which could lead to unanticipated negative consequences during the construction of the tunnels.

My written testimony presented information on how the WaterFix tunnels, while large, are well within current state-of-the-practice technologies used on large

tunnel projects throughout the world.

My testimony also explained how the potential challenges that face the WaterFix tunnel projects are very similar to those faced by other successful large projects throughout the world. Taken collectively, DWR does not foresee any issues with designing and building the WaterFix tunnels.

Testimony in front of this board alleged that pile driving and other WaterFix-related construction activities will compromise existing levees. However, no analysis or investigations to confirm those observed structure issues were caused by construction activities was presented to substantiate these claims.

My written testimony cites a number of relevant examples of recent successful pile-driving projects in the delta. Taken collectively, these projects have driven thousands of piles with a combination of vibratory and impact-driven piles near levees without any negative impact. Consequently, DWR does not foresee any issues with levee integrity due to pile-driving activities on the WaterFix.

Testimony in front of this board alleges that the WaterFix tunnels may compromise existing and planned infrastructure in the delta. My written testimony discussed in detail a number of large tunnel projects

that were successfully constructed within close proximity to sensitive existing infrastructure.

My testimony also described DWR's current commitment in the EIR/EIS to eliminate or mitigate any potential impacts to existing infrastructure from the construction of WaterFix facilities.

My testimony set forth additional new commitments by DWR to closely coordinate with potentially impacted facility owners to mitigate potential impacts. Consequently, DWR does not foresee any issue with integrity of existing infrastructure due to WaterFix construction.

My testimony clarified previous testimony which incorrectly characterized the disposition of two existing water diversions. Previous testimony alleged that the WaterFix conceptual --

(Reporter request for clarification.)

WITNESS BEDNARSKI: My testimony clarified previous testimony which incorrectly characterized the disposition of two existing water diversions.

Previous testimony alleged that the WaterFix conceptual engineering design estimates for 18 inches of sea level rise are not realistic when compared to sea level rise estimates for Port of Chicago.

My written testimony explained how DWR arrived

at the 18 inches of sea level rise in the delta based on 55 inches of sea level rise at the Golden Gate Bridge.

That concludes my comments.

CO-HEARING OFFICER DODUC: Thank you.

Ms. Buchholz?

WITNESS BUCHHOLZ: Good morning.

My testimony specifically addresses the reasons that the groundwater recharge process would not be disrupted due to the location and extent of construction and operation of proposed facilities as compared to the natural groundwater recharge methodology.

I'll briefly describe the information presented in my written testimony, starting at the intake and moving down towards Clifton Court Forebay.

At the intakes, the intakes are located to the west of the Sacramento County central groundwater basin, which includes some 40 surface areas.

As described in Attachments 1 and 2 of my testimony, the 2006 central Sacramento County groundwater management plan, which was Exhibit DWR-800, and the Sacramento central groundwater authority basin management report for 2009, 2010, which is Exhibit DWR-801, indicates both that there's only approximately 6 percent of the groundwater recharge into

the central groundwater basin that comes from the Sacramento River and that the majority of the groundwater recharge occurs due to groundwater flows from the east and from the other rivers within the basin.

The groundwater recharge from the Sacramento River would continue to occur into the central basin because the slurry walls are the concern about the slurry walls -- including that groundwater recharge flow.

But the slurry walls at the intake locations represent less than 24 percent of the total eastern river bank between Intakes 2 and 5 as described in the biological assessment, which is Exhibit State Water Resource Control Board 104 and the conceptual engineering report, Exhibit DWR-212.

Moving downstream from the intakes, the tunnel alignment between the intakes and the Intermediate Forebay are located within soils that are loose to moderately dense sands and sandy clay loams with interspersed clays. And those -- those more permeable soils extend 70 to 120 feet below the ground surface. Stiff clays occur below the sands among soils.

It's noted in Attachment 3 of my testimony that this area shown has a low groundwater recharge

capability in the 2010 Sacramento County general plan update, final EIR, Exhibit DWR-802.

Because the sands are more permeable, the groundwater recharge occurs above the stiff clays, but the tunnels are located within the stiff clays at depths of 90 to 130 feet below the ground surface and would not affect the groundwater recharge.

At the Intermediate Forebay, the slurry walls around the Intermediate Forebay could reduce groundwater flow from Snodgrass Slough to the areas located east of the forebay. However, these areas would continue to be recharged from water from the Cosumnes and the North Fork Mokelumne Rivers.

The tunnel alignment from the Intermediate Forebay to Clifton Court Forebay and Clifton Court Forebay itself, the soils in these areas are mucky clay loams, silty clay loams, clays, peat, and the clays become more prevalent towards Clifton Court Forebay.

These soils have limited groundwater recharge potential as noted in Attachment 4 of my testimony in the 2009 San Joaquin County general plan, public review draft background report which is Exhibit DWR-807.

And these areas are characterized in that report as poorly drained soils and low recharge potential. Groundwater occurs along this alignment into

the interior of the --

(Reporter request for clarification.)

WITNESS BUCHHOLZ: The groundwater recharge occurs into the interior of the islands along the tunnel alignment, which includes Stratton, Bolden, Venice, Mandeville, Bacon, Woodward, and Victoria Island.

Also, groundwater recharge occurs, and it occurs from the adjacent surface water bodies. Groundwater recharge near the adjacent islands near the Clifton Court Forebay also occurs in the adjacent sloughs and rivers.

The tunnels are constructed in this area at depths of 90 to 160 feet below the groundwater surface in clay soils and would not interrupt the groundwater recharge process at the higher levels or below the tunnels.

During the preparation of the EIR/EIS, which is State Board Water Resource Control Board Exhibit 102, we reviewed information compiled by DWR and other water agencies related to well locations and other information about the wells. However, the information as we stated in the EIR/EIS is not adequate for design of the facilities. Therefore, we acknowledge that there would be potential for wells need to be relocated or otherwise mitigated prior to construction in agricultural and

community areas as described in mitigation measures presented in Chapters 14 and 20 of the EIR/EIS.

As was discussed in Chapter 7 in Appendix 3B of the EIR/EIS, during the design phase, detailed surveys would be conducted in the vicinity of construction activities to determine current well locations, depths, pumping capacities, and groundwater drawdown occurs. In addition, groundwater monitoring wells would be installed and monitoring programs would be implemented prior to construction activities.

CO-HEARING OFFICER DODUC: Thank you.

Does that conclude, Mr. Mizell?

MR. MIZELL: Yes, that's concluding our direct for this panel.

CO-HEARING OFFICER DODUC: Thank you.

And thank you both for that very concise summary. Having read your testimony, I appreciate it very much.

And, Mr. Bednarski, even though you didn't have a chance to present your outline, let me just say I really appreciated the photos that you included. It really helped present the projects for me, the various projects you looked at.

So, with that, before we get to cross-examination, for the purposes of planning, if all

those planning on conducting cross-examination could come up and identify yourself and briefly give me your time estimate.

MR. FERGUSON: Good morning. Aaron Ferguson for Sacramento County Water Agency. I'd expect about 30 to 40 minutes.

MR. ALADJEM: Good morning, Chair Doduc, members of the board. David Aladjem, Delta Flood Control Group. Probably about 30, 40 minutes.

MS. WOMACK: Good morning. Suzanne Womack, Clifton Court LP. A brief, maybe 15 minutes at the most. Thanks.

MR. KEELING: Good morning. Tom Keeling for San Joaquin County Protestants. Probably 20 minutes.

MS. DES JARDINS: Deirdre Des Jardins, California Water Research. Probably 30 minutes.

MR. MESERVE: Good morning. Osha Meserve, the Local Agencies of the North Delta, et al. Probably 45 minutes to an hour.

MR. ETHERIDGE: Good morning.

CO-HEARING OFFICER DODUC: I don't believe your microphone is on.

MR. ETHERIDGE: Good morning. Fred Etheridge from the East Bay Municipal Utility District. Anticipate about 45 to 55 minutes. Thank you.

CO-HEARING OFFICER DODUC: So I suspect that we will not get to Panel 2 until, at the earliest, Thursday.

All right. With that, then, I will --

Mr. Aladjem, did you have anything else to add?

MR. ALADJEM: I believe that I'm first.

CO-HEARING OFFICER DODUC: Actually, I have to go through and ask the State Water Contractor first if they would like to conduct cross-examination.

MS. MORRIS: Stephanie Morris, State Water. No.

CO-HEARING OFFICER DODUC: All right.

Ms. Akroyd, welcome back. It's great to see you. I assume you also do not have cross-examination.

Mr. Williams? No.

Group 6 I don't see either.

All right. Then, Mr. Aladjem, we are definitely up to you.

MR. ALADJEM: Sit here? Or how do you want --

CO-HEARING OFFICER DODUC: How quickly we have forgotten.

Please join your witnesses, Mr. Berliner and Mr. Mizell so that Mr. Aladjem may have that seat.

Even though I'm sure Mr. Aladjem has not

forgotten the routine, I will just remind him, number one, that as you begin your cross-examination, it would be very helpful to us if you would briefly outline the points that you intend to cover.

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CROSS-EXAMINATION

MR. ALADJEM: Good morning, Chair Doduc.

Good morning, Chair Doduc, members of the board. David Aladjem, Delta Flood Group. Chair, as always, is correct, I have not forgotten the procedure.

What I'm going to do is lay a very brief foundation and then move on to some of the standards that Mr. Bednarski spoke about in terms of design construction levees. And just for the witnesses' information, I will be focusing my questioning on Mr. Bednarski this morning. I will then discuss the permitting standards, which he discusses in some detail.

Some of his rebuttal testimony talks about other projects in the delta which I want to discuss. And he also talks a little bit about truck traffic. I'll be asking questions about that as well.

CO-HEARING OFFICER DODUC: What was that last item, Mr. Aladjem?

MR. ALADJEM: Truck traffic.

CO-HEARING OFFICER DODUC: Okay.

MR. ALADJEM: Say that one five times, quickly. Mr. Bednarski.

WITNESS BEDNARSKI: Good morning.

MR. ALADJEM: Good to see you again.

WITNESS BEDNARSKI: Good morning.

MR. ALADJEM: Just some preliminary questions, sir. You've been heading up this effort for the Department of Water Resources since about 2013; is that correct?

WITNESS BEDNARSKI: That's correct.

MR. ALADJEM: And you've been in charge of the effort to design and then redesign the proposed project as it has transitioned from the BDCP to the California WaterFix?

WITNESS BEDNARSKI: That's correct in terms of what's represented in the conceptual engineering report.

MR. ALADJEM: Yes, of course. As the lead engineer, you are familiar with all the designs and flood considerations that went into designing the conceptual engineering design, correct?

WITNESS BEDNARSKI: I'm generally aware of those details, although I have members of my team here that have specific knowledge.

MR. ALADJEM: That work was all done under your supervision and direction, correct?

WITNESS BEDNARSKI: Yes, it was.

MR. ALADJEM: Thank you.

Do you know whether you're going to be testifying in Part II?

WITNESS BEDNARSKI: I do not know at this particular time.

MR. ALADJEM: Okay.

Mr. Baker, if you would put up Delta Flood Control Rebuttal Exhibit 1.

I'd like to mark this for identification, Chair Doduc. This is an excerpt, as you see here, from Appendix 6A to final EIR/EIS for the project.

Mr. Baker, if you could turn to the next page, please.

Mr. Bednarski, you're aware that final EIR has been -- EIR/EIS has been prepared and circulated for public review?

WITNESS BEDNARSKI: Yes, I am.

MR. ALADJEM: Were you involved in the preparation of the document, sir?

WITNESS BEDNARSKI: Portions of it I provided input.

MR. ALADJEM: Okay. Were you involved in the preparation of the Appendix 6A?

WITNESS BEDNARSKI: I do not recall being

involved in that.

MR. ALADJEM: Okay. I want to refer you to page 6A-32. For the record, this is from Appendix 6A in the final EIS/EIR. I highlighted the section here beginning with line 33.

Do you see that, Mr. Bednarski?

WITNESS BEDNARSKI: Yes, I do.

MR. ALADJEM: In order to save time, I'll ask you to read the highlighted section and let me know when you finished.

(Witness reviewing document.)

WITNESS BEDNARSKI: Okay.

MR. ALADJEM: Mr. Baker, could you shrink the screen a bit so we can see the line numbers? Thank you.

Mr. Bednarski, if I could direct your attention to line 35 through 38. You see that statement there: "The potential effect could be substantial because levee slips and stream banks may fail and structures built on these slips could be damaged or fail entirely as a result of slope instability."

Do you see that?

WITNESS BEDNARSKI: Yes, I do.

MR. ALADJEM: Do you agree with that statement, sir?

WITNESS BEDNARSKI: I would agree, yes, that if they're not properly engineered, that could occur.

MR. ALADJEM: You're anticipating my next question, sir.

If you look further down, the -- states -- the appendix here says that you would develop -- you, the department, would develop slope stability design criteria and these would be documented, et cetera, et cetera.

Do you see that?

WITNESS BEDNARSKI: Yes, I do.

MR. ALADJEM: And would it be your opinion that if those criteria are properly developed, that there would not be impacts in terms of slope stability or any other levee failures?

WITNESS BEDNARSKI: That would be my understanding and belief, yes.

MR. ALADJEM: And were you involved in the development of this portion of the final EIR/EIS, sir?

WITNESS BEDNARSKI: I did not participate in drafting that.

MR. ALADJEM: Okay. Let's move on.

And, Chair Doduc, that was my foundation.

Is it true, Mr. Bednarski, that the Department has not been able to conduct geotechnical analyses of

the proposed construction sites?

WITNESS BEDNARSKI: That is not entirely true.

MR. ALADJEM: Could you please clarify what then the Department has done and what the Department has not done?

WITNESS BEDNARSKI: We have been able to collect over 200 geotechnical samples through the delta, and I'll turn it over to my colleague here to respond in detail on that.

WITNESS PIRABAROOBAN: My name is Shanmugan Pirabarooban. I'm with Department of Water Resources.

Like Mr. Bednarski mentioned, we have done geotechnical exploration from 2009 through 2012. We have drilled more than 230 soil boring holes and cone penetration tests, CPT.

MR. ALADJEM: Sir, on those borings and the CPTs, were any of them in the exact locations where the intake structures will be built?

WITNESS PIRABAROOBAN: Yeah. We have a number of holes on the water side of the proposed intake sites.

MR. ALADJEM: When you say the "water side," sir, is that within the levee prism?

WITNESS PIRABAROOBAN: Depends how you define "levee prism."

MR. ALADJEM: Why don't you define it and let

me -- describe it to us, sir.

WITNESS PIRABAROOBAN: If you're strictly talking about the levee prism that you see above the water, yeah, we have not done bore holes above that.

But we have done bore holes close to the levee banks and, depending on the time of the year, if the water level is really low, you could say some of those bore holes would be located within the levee prism.

MR. ALADJEM: Let's see if I understand this, sir.

None of the CPTs or the bore holes were done on the levee above the water surface in the area where the intakes would be constructed. All of those samples were done below the water surface on the water side of the levee -- but you're saying above the hinge point where the extension of the levee prism would meet the stream bed; is that correct?

WITNESS PIRABAROOBAN: Above the hinge point? Are you saying above the hinge point?

MR. ALADJEM: Above the hinge point.

WITNESS PIRABAROOBAN: Well, my understanding is hinge point is at the crust level, levee crust level. And if you say above the hinge point --

MR. ALADJEM: We're handicapped here because we don't have a levee diagram, I'm afraid. But at the

point where the extension of the levee slope hits the stream bed, that was done landward of that point?

WITNESS PIRABAROOBAN: Not on the land side.

MR. ALADJEM: Landward in the water?

WITNESS PIRABAROOBAN: Landward in the water.

MR. ALADJEM: Chair Doduc, let me offer here that it may be useful at some point to take a break and come back with a levee diagram. I don't have it in front of me. I didn't anticipate this.

CO-HEARING OFFICER DODUC: Are you willing to proceed at this point without that diagram?

MR. ALADJEM: I would love to have the diagram. I don't want to delay this. I think we got some of the information we need.

CO-HEARING OFFICER DODUC: All right.

MR. ALADJEM: Mr. Bednarski, let me go back to you.

If the project were to be approved or you were to receive permission to enter onto property in the area which would be constructed for the intakes, is it fair to say that DWR would then conduct an extensive geotechnical investigation?

WITNESS BEDNARSKI: Yes, that is correct.

MR. ALADJEM: And would that include borings?

WITNESS BEDNARSKI: Yes.

MR. ALADJEM: How far apart would those borings be?

MR. MIZELL: Objection. Speculative. Depends on which property they're talking about. He's asking for a hypothetical if and when we get access to those properties.

MR. ALADJEM: Chair Doduc, the witness has said -- and I'll go into this in more detail -- "Trust us. We will construct this to engineering specifications."

I'm entitled to ask how he's going to develop those and what they will be.

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

Please answer to the best of your ability, Mr. Bednarski.

As you're pondering that, Mr. Jackson, is there a problem?

MR. JACKSON: As the oldest person here, maybe I'm the only one who can't hear, but I can't hear a thing.

CO-HEARING OFFICER DODUC: Apparently -- Mr. Ochenduszko, are you addressing that problem since Mr. Herrick is just as old and can't hear as well?

MR. OCHENDUSZKO: Yes. We've turned it up as

much as we can. And we understand that when the air-conditioning vent is going on, it's a little hard to hear. We'll work with the AV team and try to resolve that.

CO-HEARING OFFICER DODUC: Perhaps you might move away from the vents.

MS. RIDDLE: Maybe everyone could speak up directly into the microphones.

CO-HEARING OFFICER DODUC: Let's continue.

At some point, if that still is an issue, Mr. Jackson, let us know and we will take a break at that point so Mr. Aladjem may obtain his diagram.

All right. With that, Mr. Bednarski.

WITNESS PIRABAROOBAN: Well, we have developed a geotechnical exploration plan, based on the conceptual engineering that we have completed to date. And it is described in the Chapter 3 of the final EIR/EIS.

And I believe your question is about the spacing --

MR. ALADJEM: That is correct. Thank you, sir.

WITNESS PIRABAROOBAN: -- for the tunnels.

Our current plan is to do the future work in two phases. During the Phase 1, the bore holes and CPTs will be spaced at approximately 1,000 feet. Based on

the data collected during Phase 1, we will, you know, determine the spacing for the Phase 2, but currently, the EIR/EIS we have described the Phase 2 holes and CPTs will be located approximately every 500 feet.

And typically for linear projects like tunnel and pipelines, the spacing that we have land for is very aggressive. They don't go for like every 500 feet.

MR. ALADJEM: And is that discussion of how you would evaluate the geotechnical stability, would you include in that an evaluation using LIDAR?

WITNESS PIRABAROOBAN: My understanding is that, you know, matters such as LIDAR provide data in a limited condition.

Here, we have tunnel proposed at, you know, approximately 150 feet below ground. But just to collect preliminary data over large area, that would be a method we can use. And, you know, in our geotechnical exploration plan, we have identified the geophysical exploration methods as well. It's not just bore holes and CPTs.

MR. ALADJEM: Perhaps my question wasn't quite clear. I'm concerned about the levee area in construction of the intakes, not the overall tunnel.

Obviously, if it's 150 feet below ground surface water, it's not particularly useful. In that

impact area where the intakes would be located, in addition to bore holes and CPT, would you use LIDAR?

WITNESS PIRABAROOBAN: Yeah. In fact, I think we have some historical data. I don't know when that was done. I'm not familiar with that data. But when we were working on the location for the intakes, some of us looked at those data.

MR. ALADJEM: And as part of your evaluation of that area, would the Department be evaluating not necessarily in the construction area but in that general vicinity the impacts of various encroachments, pipelines, other sorts of encroachment upon the levee?

WITNESS PIRABAROOBAN: Are you talking about everything or the --

MR. ALADJEM: Yes.

WITNESS PIRABAROOBAN: If they're located within our project footprint, yeah, we would be evaluating them.

MR. ALADJEM: Presumably the very first thing you would do, once you receive permission to inspect that property, would be to evaluate the current stability of that levee; isn't that correct?

WITNESS PIRABAROOBAN: So if you are strictly talking about the intake reaches at the intake sites as it's described in Mr. Bednarski's written testimony,

we've had to go through a Section 4 permitting with the Army Corps of Engineers and that will include all this, evaluates conditions and future conditions.

MR. ALADJEM: You're anticipating several of my lines of questioning.

Would you do that also with the areas that will be used for haul routes?

WITNESS PIRABAROOBAN: Are you asking if we will do that?

MR. ALADJEM: Yeah.

WITNESS PIRABAROOBAN: And I think, again, it's highlighted in Mr. Bednarski's testimony that we have identified approximately 6 miles of levee road in the middle of the delta that could potentially be used as a haul route and we plan to evaluate those levees.

MR. ALADJEM: Mr. Bednarski, am I correct in understanding that the Department has said that at the end of this project, levee stability will be at least as good as it is today?

WITNESS BEDNARSKI: That is correct. For the areas that we directly impact either with haul roads or making modifications to those levees, yes, that would be this.

MR. ALADJEM: So by implication, sir, if there is indirect impact, the Department is making no

representations that it would actually upgrade the levee to meet what -- the current standard?

WITNESS BEDNARSKI: I'm not sure how you would characterize an indirect impact. So I'm not sure how I would make a statement regarding that.

MR. ALADJEM: Okay. Let's go here. In your rebuttal testimony, you criticized Mr. Cosio's direct testimony, and you indicated that there was no causal link between pile driving and impacts on a levee that was several miles away as Mr. Cosio testified.

Do you recall that, sir?

WITNESS BEDNARSKI: Yes, I do.

MR. ALADJEM: Assume for the sake of our discussion this morning that there is a causal link that is found. Would that be a direct impact, in your view?

WITNESS BEDNARSKI: Yes.

MR. BERLINER: Objection. Beyond the scope of testimony and beyond the scope of Mr. Cosio's testimony, as well.

CO-HEARING OFFICER DODUC: Mr. Aladjem?

MR. ALADJEM: Chair Doduc, Mr. Cosio testified that he had had experience with projects where pile driving had had impact several miles away.

Mr. Bednarski, in his rebuttal, said Mr. Cosio was wrong. He did not have any basis for his opinion.

I'm now trying to describe, figure out, what Mr. Bednarski's opinion is and what the limits of that are.

CO-HEARING OFFICER DODUC: I'll allow you a little bit of leeway, Mr. Aladjem.

MR. MIZELL: Thank you.

For clarity for the witness's purposes, it would be nice if Mr. Aladjem would define specifically what he means by "direct" and "indirect" as the witness has indicated he's not sure what definition Mr. Aladjem is using for --

CO-HEARING OFFICER DODUC: Yes. I trust that the witnesses will ask clarifying questions if needed.

MR. ALADJEM: Mr. Bednarski, I think we actually have resolved this because, if I understood you correctly, you said that if there was a causal link between an effect of the project and levee instability somewhere else, that that would be considered direct impact and the Department would refurbish, reconstruct the other levee to its current standard or better.

WITNESS BEDNARSKI: In that hypothetical situation, yes, I would agree with that. If there was a causal link that could be determined.

MR. ALADJEM: Thank you. That's all I was trying to get at.

Mr. Bednarski, in evaluating the levees here, you're going to use their current condition; is that correct?

WITNESS BEDNARSKI: To commence our assessment?

MR. ALADJEM: Yes.

WITNESS BEDNARSKI: Yes, we would start with their current condition.

MR. ALADJEM: Let me move on here to the 408 process here. The Department has filed a 408 application with the Corps of Engineers; isn't that correct, sir?

WITNESS PIRABAROOBAN: I wouldn't describe it as application. We have submitted a request with the board -- sorry -- Central Valley Flood Protection Board.

MR. ALADJEM: And is that the start of the 408 process?

WITNESS PIRABAROOBAN: Initiate the 408 process, yeah.

MR. ALADJEM: As part of the 408 process, is my understanding correct that the flood board will require the Department to coordinate with local maintaining agencies?

WITNESS PIRABAROOBAN: I'm not sure who the local maintenance agency would be for the levee section

where the proposed intakes would be located, but I think typically that is done.

MR. ALADJEM: Under the 408 process, as I understand it, the Department would have to demonstrate to the Corps of Engineers that the levees would be stable under a variety of different circumstances; is that correct?

WITNESS PIRABAROOBAN: Well, the Department has to show to the Army Corps of Engineers that the proposed alterations won't be injurious to public use as well as it won't impair the usefulness of the project.

MR. ALADJEM: And what are the engineering criteria that the Department would use to make that showing?

WITNESS PIRABAROOBAN: It's not up to the Department. It's already clearly defined in the engineering circular from the Army Corps of Engineers, and we have included it as Exhibit DWR-657.

And it depends on the alterations that are being proposed. So the Army Corps of Engineers, mainly their district office, will determine what level of analysis and documentation that we need to provide.

At minimum, we will be asked to provide hydraulic analysis, geotechnical analysis, and specifications.

MR. ALADJEM: Thank you, sir.

If I understand the Corps of Engineers regulations correctly --

CO-HEARING OFFICER DODUC: Please get closer to the microphone.

MR. ALADJEM: Oh, I'm sorry. Is that okay?

CO-HEARING OFFICER DODUC: Much better.

MR. ALADJEM: If I understand the Corps of Engineers regulations, the evaluation process for a 408 permit allows for but does not mandate an independent expert peer review panel.

Are you aware of that requirement, sir?

WITNESS PIRABAROOBAN: I think it would -- it would be mandated. That depends on the type of alteration.

MR. ALADJEM: I understand, but there is a provision in the Corps of Engineers guidance that allows for such an independent expert peer review?

WITNESS PIRABAROOBAN: That is correct.

MR. ALADJEM: Would the Department be willing to agree to such an independent peer review in the construction of the proposed WaterFix project?

MR. MIZELL: Objection. Beyond the witness's rebuttal testimony. We have not had him address what the Department will or won't agree to as a condition to

this.

CO-HEARING OFFICER DODUC: Mr. Aladjem, do you wish to withdraw that question or rephrase it?

MR. ALADJEM: Let me rephrase it.

Does the Department have any plans to request as part of the 408 process an independent expert peer review?

WITNESS PIRABAROOBAN: If the Army Corps of Engineers would require us to do that, then we will comply with that.

MR. ALADJEM: That was not the question, sir. Does the Department have a plan to request it?

WITNESS PIRABAROOBAN: As far as I know, I'm not aware of such a plan.

MR. ALADJEM: So the answer is "no"?

WITNESS PIRABAROOBAN: I said at the beginning, the Army Corps of Engineers, who are the ones who are going to grant us the permit, if they make that as a condition, then we will comply with that.

MR. ALADJEM: But if I understand correctly --

CO-HEARING OFFICER DODUC: Enough, Mr. Aladjem.

MR. ALADJEM: Thank you.

Mr. Bednarski, if I may return to you. Are you familiar with the Department's urban living design

criteria?

WITNESS BEDNARSKI: I am.

MR. ALADJEM: Any other member of the panel familiar with those criteria?

WITNESS PIRABAROOBAN: I'm somewhat familiar with that, but I haven't worked on urban valley for some time.

MR. ALADJEM: Let's move on. Since you're really not familiar, it's not useful.

Mr. Baker, could we put up FDCG Rebuttal Exhibit 2, page 8-1?

And I will represent to the witnesses here that this is the Department's urban living risk reduction program guidelines, and we are at page 8-1.

Mr. Bednarski, are you familiar with these guidelines?

WITNESS BEDNARSKI: No, I am not.

MR. ALADJEM: Is any other member of the panel familiar with the guidelines?

WITNESS PIRABAROOBAN: I'm not familiar with these guidelines. But I would like to state that if you are talking about the levee sections near the intake, those are not urban levees.

MR. ALADJEM: I understand. That was not going to be my question.

But, Chair Doduc, because they're not familiar, let's move on.

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

MR. ALADJEM: Does the Department have any -- strike that.

Has the Department requested any independent outside reviews to evaluate the geotechnical analysis when it is eventually done?

WITNESS PIRABAROOBAN: Could you repeat that question?

MR. ALADJEM: Sure. Let me rephrase it.

When the Department eventually conducts its geotechnical analysis, does the Department intend to employ independent peer reviewers to evaluate that geotechnical analysis and the engineering designs based upon it?

WITNESS PIRABAROOBAN: Some part would be -- part of the geotechnical investigation, as well as the analysis, would be reviewed by outside agencies such as Army Corps of Engineers when it follows the work that we do within the -- the project levees. And also the other work that we would do for the forebays would be reviewed by the DSOD, Division of Safety of Dams.

As far as the tunnels are concerned, I'm not

sure. You know, Department may do. But, right now, I know we don't have a plan.

MR. ALADJEM: So if I understand this, it would be DSOD for the forebay, you're not sure with the tunnels, and the Corps of Engineers for the levee area of the intakes?

WITNESS PIRABAROOBAN: As of now, that's my understanding, yeah.

WITNESS BEDNARSKI: Let me add some clarification to that also.

As part of the design and construction enterprise that will be implementing the WaterFix facilities through design and construction, we do have a portion of the organization that will deal with providing independent review. Board of experts can be called on an as-needed basis to review different parts of the design. But at this point in time, we have not determined where those reviews might take place.

MR. ALADJEM: Has it been determined who will be on that board of experts?

WITNESS BEDNARSKI: It has not. I would anticipate that the board of experts would change depending on what the review component was required to be looked at.

MR. ALADJEM: And the Department would look to

determine who would be appropriate experts for that board, correct?

WITNESS BEDNARSKI: That's what I would anticipate, yes.

MR. ALADJEM: And now let me direct your attention to DFCG Rebuttal No. 2. This is page 8-1.

If you would direct your attention here to the highlighted areas: "Reviewers must be individuals who are distinguished experts in engineering, hydrology, and other appropriate disciplines. Reviewers must be free from any real or apparent conflicts of interest. Reviewers shall not be under contract with the state for any work that is either associated directly with or by reference to these guidelines or projects."

Mr. Bednarski, in selecting members for the board of experts, would it be appropriate for the Department to use these guidelines or similar guidelines?

MR. MIZELL: Object to this line of questioning. The witnesses have indicated no familiarity with this document. So whether or not the document applies to the DCE and the board of independent experts is wholly speculative at this point. I would ask that Mr. Aladjem at least allow the witnesses time to fully read this document and find out if it's

actually applicable.

CO-HEARING OFFICER DODUC: Mr. Aladjem, I believe, is asking specifically not for endorsement of the document itself, but for the application of these pretty general concepts to the act of selecting witnesses. So I will allow him his question.

And, Mr. Bednarski, to the extent you will be involved in or are familiar with the selection of these reviewers, you may answer the question.

WITNESS BEDNARSKI: Thank you.

I think these three areas that are outlined on a -- on first read it makes sense to be preliminary criteria for reviewers, although I don't want to necessarily commit at this point in time that those would be the only criteria or some of the criteria.

MR. ALADJEM: Thank you, Mr. Bednarski. Let me move on to a different line of questioning.

Mr. Bednarski, your testimony provided examples of nine other large projects, tunnel projects, that were constructed around the world; is that correct?

WITNESS BEDNARSKI: That's correct.

MR. ALADJEM: And you classified, if I recall, all but one of those projects a "soft or mixed-ground tunnels mined with tunnel-boring machines, which is the same design condition as the WaterFix tunnels."

Do you recall that statement?

WITNESS BEDNARSKI: Yes, I do.

MR. ALADJEM: Just to state the obvious, sir, none of those projects were designed or built by the Department?

WITNESS BEDNARSKI: No, they were not.

MR. ALADJEM: And they were not built under DWR oversight, either?

WITNESS BEDNARSKI: No, they were not.

MR. ALADJEM: Okay. The proposed tunnels are a single-pass system, correct?

WITNESS BEDNARSKI: If you're referring to the tunnel-lining system, yes.

MR. ALADJEM: Yes. Of the nine tunnel projects that you identified, which of those are single-pass?

WITNESS BEDNARSKI: Let me check my notes, here.

My recollection would be that all of them are, with the exception of the Bay Tunnel in San Francisco.

MR. ALADJEM: And which of those were pressurized, sir?

WITNESS BEDNARSKI: I believe that the Blue Plains Tunnel, the Willamette River Project Tunnel, and the Bay Tunnel would be considered as pressurized

tunnels.

MR. ALADJEM: Let me return to the question of pile driving.

You identified a number of projects in your rebuttal testimony, sir. Do you recall that testimony?

WITNESS PIRABAROOBAN: Yes.

MR. ALADJEM: Is it correct that of those projects, only the Freeport project is located in the North Delta?

WITNESS PIRABAROOBAN: I believe the Sankey diversion, that's also located in the North Delta.

MR. ALADJEM: I believe the Sankey diversion is north of the legal delta, but you would stipulate that it's outside the legal delta, it's not in the delta?

WITNESS PIRABAROOBAN: Yeah. I'm not sure about where the boundary extends, but it's pretty close.

MR. ALADJEM: Okay. And, Mr. Bednarski, your testimony is that the geologic conditions at all of those different locations are the same as the conditions you would find at the intake location?

WITNESS PIRABAROOBAN: They're not going to be hundred percent identical same. But, in general, they are similar.

MR. ALADJEM: It begs the question if -- how

much is the same --

WITNESS BEDNARSKI: Could you rephrase that question?

MR. ALADJEM: Would it be fair to say that the Department believes that they are sufficiently similar that the experience of those construction projects is directly applicable to the proposed project here of the tunnels?

WITNESS BEDNARSKI: Yes, the projects in the delta, yes.

MR. ALADJEM: Let me move on to truck traffic.

Mr. Bednarski, you said during the case in chief that you -- the Department would be undergoing investigations to determine which levee sections would be deficient to carry the weight that would be associated with the project. Is that still correct?

WITNESS BEDNARSKI: Yes, it is.

MR. ALADJEM: Can you share the status of that investigation?

WITNESS BEDNARSKI: We have not commenced that investigation at this time.

WITNESS PIRABAROOBAN: But we have identified the investigation that would be carried out in the final EIR/EIS, I believe, Section 3.

MR. ALADJEM: Okay. Mr. Bednarski, at page 16

in your rebuttal testimony, you mentioned that there's an interagency agreement in the works for State Routes 4, 12, and 160.

Has that agreement been entered into?

WITNESS PIRABAROOBAN: Yes. I believe that agreement was signed in -- in summer of 2010.

MR. ALADJEM: And does the Department have any plans to expand that agreement to cover other routes in the delta?

WITNESS PIRABAROOBAN: This is the agreement between the Department and Caltrans. And if -- if we see that, you know, our project needs other routes -- when I say "other routes," state routes, yeah, then that's a possibility. But at this point, we are not expecting our projects will need other routes.

MR. ALADJEM: And would those three state routes -- Highways 4, 12, and 160 -- carry the vast preponderance of the truck traffic necessary for the construction of the WaterFix project?

WITNESS PIRABAROOBAN: I think we have -- we are looking at minimum two options to move the materials. We are looking at using barges too. But for trucks, yeah, those three highways will be used.

MR. ALADJEM: Mr. Bednarski, you indicated there would be extensive settlement monitoring programs

implemented before and during the construction of this project, and that has been done in the past and you would do it again in connection with the WaterFix project. Do you recall that testimony, sir?

WITNESS BEDNARSKI: Yes, I do.

MR. ALADJEM: So if a levee settles or deforms as a result of the WaterFix project, the Department has committed to restoring that levee to at least as good a state as it is currently; is that correct?

MR. BERLINER: Objection. Asked and answered.

CO-HEARING OFFICER DODUC: Go ahead and answer it one more time, Mr. Bednarski.

WITNESS BEDNARSKI: That's correct. That's correct.

MR. ALADJEM: Chair Doduc, I have no further questions.

CO-HEARING OFFICER DODUC: Thank you, Mr. Aladjem. Your time estimate was really well done.

Before we move on to the next examiner, my staff is much better adding time estimate than I am.

Mr. Mizell, Mr. Berliner, I'm told that the total estimate, assuming that everyone is as proficient as Mr. Aladjem in estimating their time, we should be done with cross-examination by 3:00 o'clock.

So assuming that there is little to no direct

and recross, we actually might get to your Panel 2 today.

I'll let that settle in.

Next for Group 7, I believe, was -- actually next are Group 7.

Mr. Ferguson, I believe you estimated 30 to 40 minutes.

MR. FERGUSON: Yes.

CO-HEARING OFFICER DODUC: All right. Let me ask the court reporter: Will you be okay?

THE REPORTER: Yes.

CO-HEARING OFFICER DODUC: Please proceed.

MR. FERGUSON: Good morning. Aaron Ferguson of Sacramento County Water Agency.

My questions will be primarily directed towards Mrs. Buchholz.

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CROSS-EXAMINATION

MR. FERGUSON: Ms. Buchholz, good morning.

Did anyone assist you in preparing your written rebuttal testimony?

WITNESS BUCHHOLZ: No.

MR. FERGUSON: So I've highlighted Ms. Buchholz's rebuttal testimony, various sections of it, and proposed to mark that as an exhibit just to be

efficient as I go through and ask her questions about various sections of the testimony.

So, Mr. Baker, if you could bring up what you had marked as SCWA-100, I'd appreciate it. If you go to page 3, please.

Ms. Buchholz, on page 3 and again on page 18, you make a couple of statements in regards to Dr. Mehl's testimony, in particular on page 3, lines 15 through 18, and then, page 18, lines 21 through 24.

You roughly state that Dr. Mehl discussed with the EIR/EIS, did not address potential changes in groundwater east of Interstate 5 due to the operations of CWF intakes and that the operations of the CWF intakes would affect groundwater in that area.

Do you see that testimony?

WITNESS BUCHHOLZ: I do.

MR. FERGUSON: And did you draft similar testimony on page 18? Do you recall that?

WITNESS BUCHHOLZ: Yes.

MR. FERGUSON: Okay. Great.

So I did read Dr. Mehl's testimony just to confirm whether he did make those statements. And, in fact, I did not see where he expressly mentioned potential impacts to groundwater east of I-5 or in Zone 40 nor did the operations --

(Reporter request for clarification.)

MR. FERGUSON: Nor does he mention -- nor does he make a statement that the operations of the CWF would affect groundwaters in those areas.

Do you agree with my conclusion?

WITNESS BUCHHOLZ: My reading of his testimony both in the transcripts and in the information provided in his CWA-40 exhibit was that he's concerned about the impact of the construction operation of the California WaterFix facilities on Zone 40's facilities and that was what was showing in the CWA-40 exhibit. Those facilities are located to the east of Interstate 5.

MR. FERGUSON: Mr. Baker, could you go ahead and bring up SCWA-101, please?

Just to be clear, SCWA-101 is an excerpt from Dr. Mehl's testimony.

Page 2 in particular. And the highlighted statements, I just want to be clear what they indicate, because this kind of gets at the -- the overall opinion of Dr. Mehl with respect to the scope of his analysis.

And as you can see, he primarily indicates that there could be impacts to the South American sub-basin and that thorough analysis of the surface groundwater interaction is necessary to fully evaluate the impacts.

Do you see that testimony?

WITNESS BUCHHOLZ: I do.

MR. FERGUSON: In the lower passages?

WITNESS BUCHHOLZ: Uh-huh.

MR. FERGUSON: Okay. Would you agree that his testimony -- the more accurate representation of his testimony is that he believed there could be potential impacts to the South American sub-basin and an evaluation of the interaction between the surface and groundwater needs to be undertaken?

WITNESS BUCHHOLZ: That was a different part of the testimony than what I was referring to in the -- the portion that you highlighted earlier.

But, yes, he -- he did make this -- this portion of his testimony, too, with respect to the instream flows downstream of the North Delta diversions, and I didn't address this specifically in my rebuttal testimony.

MR. FERGUSON: Okay. I just want to be sure that his testimony is accurately characterized.

WITNESS BUCHHOLZ: This was a different portion.

MR. FERGUSON: You believe you've accurately characterized --

CO-HEARING OFFICER DODUC: She's answered that

she did not specifically address this portion of his testimony. So whether or not she characterized correctly, she did not address it.

MR. FERGUSON: All right. Let's go ahead and move on.

I'd like to ask you about stream levels and groundwater level and relationship.

Is it your understanding that changes in a stream's levels or stage can affect the groundwater level in an aquifer adjacent to the stream?

WITNESS BUCHHOLZ: It depends on the permeability of the adjacent soils to the stream and the travel time and the adjacent areas that are being diverted through groundwater wells or other methodology -- service streams. And it's a hypothetical question. Depends on the aquifer.

MR. FERGUSON: Fair enough.

So, hypothetically, if there is a hydraulic connection between a stream and an aquifer and then the stream stage drops and all else is held constant, how might this drop affect the surface water and groundwater action in the area?

WITNESS BUCHHOLZ: It would depend on the permeability of the soils at that location.

MR. FERGUSON: So could there be less recharge

to the basin?

WITNESS BUCHHOLZ: It would, again, depend upon that specific location. And when we look at those things in detail in groundwater -- and that will be some of the items that we will look at during design we put together, the field survey of the -- both the geotechnical information and the groundwater well information and put together the monitoring program.

MR. FERGUSON: If permeability is held constant and the stage drops and everything else is held constant, what would you anticipate the result would be in terms of the interaction with the basin?

WITNESS BUCHHOLZ: Depends on the length of time that the surface water reduction occurred, the extent of that surface water reduction as compared to the groundwater elevation, the travel time within the soils at that location.

MR. FERGUSON: Okay. I'd like to ask you questions about statements you made with respect to maximum reduction in groundwater level and peak changes in groundwater levels as that term is used in Figure 714.

Mr. Baker, can you please go to SCWA-100, page 3?

CO-HEARING OFFICER DODUC: While Mr. Baker is

doing that, I was remiss in asking you, Mr. Ferguson, to outline the points that you're going to be covering.

MR. FERGUSON: Okay. I just mentioned one of those. And then I'm also going to ask about the relationship between Alternative 1B and Alternative 4A that Ms. Buchholz addresses in her testimony.

I'm going to ask her if, in fact, she can answer such questions about the accuracy of the modeling or reliability of the modeling that was used to generate the results for Alternative 1B.

CO-HEARING OFFICER DODUC: Okay. And get closer to the microphone, please, Mr. Ferguson.

MR. FERGUSON: I'm also going to ask her about Alternative 4A -- I'm sorry -- groundwater modeling, relying on Alternative 4A.

I'm going to ask her a few questions about recharge. I'm not sure her testimony deals with the nature of the recharging in the basin.

Turning to page 3. As you know, in your testimony, there are multiple sections where you make similar statements with respect to the item I'm going to discuss.

On page 3, lines 19 through 23, you indicate groundwater model result in the DDCPC EIR/EIS Figure 714 show that a maximum reduction of 5 feet in groundwater

elevations along the Sacramento River would occur during to operations of five intakes under Alternative 1B, and that the changes in the groundwater elevations would not affect groundwater to Interstate 5.

And you make a similar statement on page 18, and again on page 19. In each of these pages you use the term "maximum reduction in groundwater elevation from the Sacramento River."

Can you explain what you mean by "maximum reduction in the groundwater levels"?

WITNESS BUCHHOLZ: This information came from results of model which is called Central Valley Hydrologic -- CVHM, Central Valley Hydrologic Model-D, for the delta.

We ran this model, and it's a monthly model. We operated it with input from the monthly CalSim 2 model for surface water flows and starting at the delta boundary at Freeport and going out to the Benicia Bridge.

The model looks at what the change in the operations between the alternative and the no-action alternative existing conditions and looks -- and then predicts, under each one of the alternatives, what the groundwater elevation will change on a monthly basis, depending upon the input from the CalSim 2 surface water

flows.

MR. FERGUSON: So the -- the graphic indicates, I think in the dark green -- and I'm referring to 714. And you mentioned it here that there's a maximum reduction of 5 feet in groundwater levels. Over -- over what time periods are you measuring?

WITNESS BUCHHOLZ: The graphics in Figure -- in Chapter 7 on the EIR/EIS were prepared -- they're on a GIS animation. And the graphics that were selected for each of the alternative conditions showed a -- sometimes the -- the elevation change would be less than -- would be zero or less than 3 feet, and the maximum that was picked up was 5 feet. And this was confirmed, not in graphics specifically, but in the model output that we also looked at when we selected the graphics.

MR. FERGUSON: So is that a maximum change from one month to the next or one year to the next or --

WITNESS BUCHHOLZ: Maximum change in the -- under the alternative for that month as compared to that month in the no-action alternative.

MR. FERGUSON: So in a given month period, the alternative compared to the no-action?

WITNESS BUCHHOLZ: Yes.

MR. FERGUSON: Okay. So, in your opinion, is the maximum reduction, as you've just described it, indicative of long-term changes in stream aquifer interaction?

WITNESS BUCHHOLZ: The model does not assume changes in the permeability of the soils. They assume that's a constant throughout the process.

MR. FERGUSON: So is the maximum reduction indicative of long-term groundwater storage conditions?

WITNESS BUCHHOLZ: When you look at the total output of the model, we did not see any change in the overall long-term average of the groundwater elevations in that -- in the period of time that the model ran.

And the model is capable of showing that we see that in other areas of the state, but not in this situation related to the operations.

MR. FERGUSON: So from the beginning of model run to the end, you're saying you see no appreciable change in groundwater storage conditions --

WITNESS BUCHHOLZ: Not --

MR. ALADJEM: -- in the South American sub-basin?

WITNESS BUCHHOLZ: Not an increase or a decrease on the model outputs that we looked at along the river downstream of the delta river intake.

MR. FERGUSON: Mr. Baker, can you please bring up SCWA-103 really quickly?

So, Ms. Buchholz, I think you may have addressed this, but -- so this graphic, just real quickly, it uses the term -- as you know, in the caption it uses the term "forecast in groundwater level changes in the delta during a typical peak groundwater level change condition."

That terminology is no different than the maximum reduction concept; is that correct?

WITNESS BUCHHOLZ: That's correct.

MR. FERGUSON: So all the questions I just asked you about maximum reduction, you'd give the same answer if I asked similar questions about --

WITNESS BUCHHOLZ: Yes.

MR. FERGUSON: I just want to confirm since it's different terminology.

I'd like to ask you a couple of questions about your opinions in your testimony indicating that we would seek, you know, essentially similar groundwater elevation changes under Alternative 4A as we do under Alternative 1B because the results you just presented, as you indicate, were conducted under Alternative 1B, correct?

WITNESS BUCHHOLZ: Yes.

MR. FERGUSON: Okay. Perfect.

So if we could go to page 3, lines 23 through 25, on DWR-100 -- sorry. SCWA-100, page 3, lines 23 through 25.

Thank you.

So you indicate the results would be similar, and we're talking about the 5-foot evaluation change, correct?

WITNESS BUCHHOLZ: Right. Zero to 5 feet.

MR. FERGUSON: The results would be similar under the proposed Alternative 4A as could be determined by comparing the minimum Sacramento River flows under Alternatives 1B and 4A.

Do you see that testimony?

WITNESS BUCHHOLZ: I do.

MR. FERGUSON: Did you provide similar testimony on page 19, lines 1 through 3, and then again on page 20?

WITNESS BUCHHOLZ: Yes.

MR. FERGUSON: Okay. So I just want to try to clarify what you're saying, and you tell me if I'm correct.

Are you saying that the groundwater level changes under Alternative 4A would be similar to the groundwater changes under Alternative 1B because

Alternative 4A and 1B shows similar minimum Sacramento River flows downstream to the North Delta diversions?

WITNESS BUCHHOLZ: The discussion here is specific to the effects of changes in the Sacramento River flows from CalSim 2 model as input to the CVHM D-Model. And that was -- when we looked at it, the only thing that's changing is the Sacramento River flows. Flows during these drier periods are similar under Alternative 1B and Alternative 4A.

Even though Alternative 1B has five intakes, Alternative 4A has three, but because of the North Delta bypass flow requirements, total diversions would be similar no matter how many intakes we had. So the flows in the Sacramento River are -- are similar in the drier periods under 1B and 4A downstream of the North Delta intakes.

MR. FERGUSON: Just to clarify, you said the only thing that's changing is the Sacramento River flow. So there's nothing that's different between, say, Alternative 1B and Alternative 4A with respect to what's going on, say, with regards to pumping in the South America sub-basin?

WITNESS BUCHHOLZ: CVHM D is assuming the same amounts of diversions by local water users in both.

MR. FERGUSON: How about the same amount of groundwater pumping?

WITNESS BUCHHOLZ: Well, that would be groundwater pumping by the local water users, whether it's local or regional.

MR. FERGUSON: Excuse me. You said "diversions," so I didn't know if you meant surface water use versus groundwater use.

But you're saying that the water use and the source of that water that's used in the South American sub-basin all have the same between Alternative 4A and 1B?

WITNESS BUCHHOLZ: Same in all the CVHM D ones, yes.

MR. FERGUSON: One more question in that regard. You'd assume that the, say, the hydraulic radiant between the river and the sub-basin would be roughly similar until Alternative I-A and 4B?

WITNESS BUCHHOLZ: We are assuming that, yes.

MR. FERGUSON: Okay. I'd like to ask you a couple questions about the modeling, the CVHM modeling.

Figure 714 of the EIR/EIS was based on results of the CVHM D model, correct?

WITNESS BUCHHOLZ: Yes.

MR. FERGUSON: And it doesn't appear from your

statement of qualifications that you're a groundwater modeler, correct?

WITNESS BUCHHOLZ: I am a groundwater modeler, but I don't operate the CVHM D, because I don't do GIS.

MR. FERGUSON: Okay. Would you be able to answer questions I have about the accuracy or reliability of the CVHM D model as it relates to the analysis here?

WITNESS BUCHHOLZ: I can answer to the best of my knowledge.

MR. FERGUSON: Okay. So are you familiar with the concept of a water budget error in groundwater models?

WITNESS BUCHHOLZ: Yes.

MR. FERGUSON: And are you aware that the water budget error is generally measured as a difference between inflow and outflow?

WITNESS BUCHHOLZ: Generally, yes.

MR. FERGUSON: Okay. And are you aware that the scientific literature suggests acceptable maximum budget error is around 1 percent?

WITNESS BUCHHOLZ: I'm not aware of that number offhand.

MR. FERGUSON: Okay. Mr. Baker, can you please bring up SCWA-104, please. If you can scroll

down to page 2. Let me identify the document. Back up to page 1.

So the groundwater experts that SCWA has retained to help us identify this document, and it's a source document that they rely on. And so they provided it to us in order to give us a sense of the standard criteria, if you will, for water budget error.

Are you familiar with this document?

WITNESS BUCHHOLZ: I am not.

MR. FERGUSON: Can you please scroll down to page 2? So I've highlighted a couple key sections.

As you're probably well aware -- let me just read them into the record. The first highlighted section states: "Water budget calculations are standard features in most codes. And the computer water budget helps the modeler assess the accuracy of the numerical solution and allows comparison with the field-based water budget."

Can you scroll --

CO-HEARING OFFICER DODUC: Mr. Ferguson, you are reading a lot of things into the record. I am losing my patience with that. I would suggest that you ask Ms. Buchholz to read what she needs to read, keeping in mind she is not familiar with this document that you're putting up, and proceed with your questioning.

MR. FERGUSON: Okay. Well, the next highlighted section, if -- discusses what's an acceptable budget error. And it goes on for about a paragraph at the end of page 2 and page 3.

So is this something you're familiar with, Ms. Buchholz?

WITNESS BUCHHOLZ: I'm not familiar with this document. I am familiar with the concept of water budget errors. I want -- I could state that that's -- we recognize that there is a monthly model. And we also recognize that we're using input from a monthly model from CalSim 2.

But this model analysis should not be used in a predictive manner. It needs to be used in a comparative manner to understand trends between the alternatives.

So we aren't -- we would recommend and do recommend in the document not to use the output specifically in a predictive manner. That's why we recognize the budget error. It occurs both in no-action and in the alternative model runs.

And, therefore, we use them appropriately in a comparative manner to understand the trends, that changes could occur with implementation of the alternatives as compared to the no-action alternative.

If I'm skipping ahead, I apologize.

CO-HEARING OFFICER DODUC: Where are you going with your line of questioning with respect to budget error?

MR. FERGUSON: Well, I wanted to ask her if she's aware of or, say, the petitioners looked at the budget error or the budget errors with input in order to assess the modeling result accuracy.

CO-HEARING OFFICER DODUC: Ms. Buchholz?

WITNESS BUCHHOLZ: The CVHM D model was developed by the United States Geological Survey. In their documentation for this model, they also -- they also discuss the level of -- I don't want to say "accuracy," but the use of the model based upon the information used to prepare the model. And, again, it should be used -- it's generally used in a comparative manner.

So I would refer you back to the documentation for the U.S. Geological Survey. And I don't have that right in front of me, although I could bring it up, if I needed to. It's part of the references for the EIR/EIS.

MR. FERGUSON: Okay.

CO-HEARING OFFICER DODUC: I think we've exhausted this one. Let's move on, please.

MR. FERGUSON: Let me just offer -- our

experts took a look at the water budget error and created a figure, which is what I wanted to ask her about, but it's something we can certainly do on surrebuttal too.

CO-HEARING OFFICER DODUC: If you have it available, go ahead and put it up, and Ms. Buchholz may answer, if she can.

MR. FERGUSON: Okay. Can you please bring up SCWA-105, Mr. Baker? Again, this is an an exhibit that --

CO-HEARING OFFICER DODUC: Is this something you'll be bringing up as part of your rebuttal?

MR. FERGUSON: No. It is something we would bring up on surrebuttal in order to address -- she raised Alternative 1B in her testimony for the first time and is relying on it for an assessment and her conclusions about the --

CO-HEARING OFFICER DODUC: Microphone, please.

MR. FERGUSON: Excuse me. Ms. Buchholz raised Alternative 1B for the first time in her rebuttal testimony as a good indication of what sort of impacts there might be on the groundwater basin.

So, no, we didn't foresee a need to bring this sort of information into the rebuttal testimony, but now we're trying to address the fact that she's relying on

Alternative 1B.

CO-HEARING OFFICER DODUC: Go ahead, please.

MR. MIZELL: If I could respond to that.

Ms. Buchholz is simply referring to material that has been available for years that is found in the EIR/EIS. It's not new material. It wasn't generated specifically for her rebuttal testimony. And, therefore, it's been in the public purview for quite a long time.

CO-HEARING OFFICER DODUC: Thank you.

Mr. Ferguson, ask your question.

MR. FERGUSON: Okay. So I'll represent to you, Ms. Buchholz, that this figure reflects the inflow and outflow discrepancy for the 510 simulated months of CVHM D modeling for the no-action alternative and Alternative 1B.

And on the horizontal axis is the simulated month and the discrepancy, which is the difference between inflow and outflow that's reflected on the vertical axis.

The red squares are for Alternative 1B, and the blue diamonds are for the no-action alternative.

Again, as I said, according to the literature, 1 percent maximum budget error is considered standard, so I --

CO-HEARING OFFICER DODUC: She's testified she's not aware of or familiar with that. So what is your question here with respect to this chart?

MR. FERGUSON: Well, in your opinion, Ms. Buchholz, with the water budget error exceeding the 1 percent threshold about 25 percent of the time in each scenario which is depicted here on this graphic, do you believe the modeling results you rely on in your rebuttal testimony as reflected in Figure 14 are reliable?

WITNESS BUCHHOLZ: I'm afraid I can't respond to this graphic. I'm not sure what locations that would use the information that we compared. I apologize, but I cannot respond at this time.

CO-HEARING OFFICER DODUC: Fair enough, Ms. Buchholz.

MR. FERGUSON: So do petitioners have a witness or somebody that could address reliability issues or accuracy issues with the CVHM D modeling?

MR. BERLINER: I guess I'm a little bit unclear since the witness has already indicated that these models were used in a comparative mode and not a predictive mode. I fail to see the relevance of the band of error because it's common to both the no-action alternative and the actions.

CO-HEARING OFFICER DODUC: Good point, Mr. Berliner.

MR. FERGUSON: The concern, I believe, is with each, both the no-action and the alternative. If the math isn't essentially balancing out, then both sets of results are suspect.

So it's not an issue of comparing one to the other. It's ensuring that each run, the math is essentially balancing out so you can rely on both -- either sets of results.

WITNESS BUCHHOLZ: When we use these models --

MR. BERLINER: Hang on. Let's get a question.

CO-HEARING OFFICER DODUC: Actually, Ms. Buchholz, I think you were about to clarify.

WITNESS BUCHHOLZ: When we use model runs within a comparative manner, we acknowledge that one of the reasons why we state specifically that these models are not predictive is that do have -- they're not specific for monthly models; that they -- they may have -- and, again, I don't know. I'm not going to say that we do have an error because I don't know how it was calculated. But there are other items in this we acknowledge right up front that this uses CalSim's input that has its inherent comparative processes too.

So if they're saying there was the same range

of error -- excuse me -- same range of uncertainty in the no-action alternative or the alternative that are being compared, we really can then really look at what the change that's affected by the implementation of the alternative. And that's why we say don't use these predictively.

CO-HEARING OFFICER DODUC: Thank you.

MR. FERGUSON: I'll move on.

CO-HEARING OFFICER DODUC: Move on, Mr. Ferguson.

MR. FERGUSON: Real quick, I am going to ask you a few questions about groundwater modeling using Alternative 4A operational scenario.

The DWR conducted groundwater modeling using CVHM and CVHM D in preparation of the 2013 EIR/EIS, correct?

WITNESS BUCHHOLZ: Yes.

MR. FERGUSON: And the EIR/EIS groundwater modeling was not conducted using operational scenario of 4A, correct?

WITNESS BUCHHOLZ: That's true.

MR. FERGUSON: And DWR did not conduct any new groundwater modeling for the RD EIR; is that correct?

WITNESS BUCHHOLZ: For the operations, yes.

MR. FERGUSON: But DWR did prepare new

modeling for the final EIR/EIS, correct?

WITNESS BUCHHOLZ: For the construction effect.

MR. FERGUSON: But not for the operational effects?

WITNESS BUCHHOLZ: No. We only -- let me see if I can remember this correctly. Not for CVHM D's, the operations, no.

MR. FERGUSON: So the modeling that was conducted, in your opinion, that would not have been more relevant to your assessment of groundwater elevation impacts than your use of the BDCP on groundwater modeling?

WITNESS BUCHHOLZ: Because the Sacramento River flows were similar under both Alternatives 1B and 4A, we believe that that is adequate to indicate the effects of Alternative 4A.

MR. FERGUSON: I'd like to move on real quickly and ask you a couple questions about recharge.

So if you can bring up SCWA-100 one more time. On page 4, so on lines 4 through 22.

Ms. Buchholz, I have it highlighted on the screen. If you can take a quick minute to read that.

(Witness reviewing document.)

MR. FERGUSON: And do you have similar

testimony later in your testimony as well regarding these studies that you cite?

WITNESS BUCHHOLZ: Yes.

MR. FERGUSON: Okay. So by referring to these studies and figures and describing the movement of groundwater in this highlighted passage, it appears your opinion is that the recharge of the basin is primarily from the east; is that correct?

WITNESS BUCHHOLZ: That is correct.

MR. FERGUSON: But you do acknowledge that the Sacramento River does provide some amount of recharge to the South American sub-basin, correct?

WITNESS BUCHHOLZ: Yes, I do.

MR. FERGUSON: So are you familiar with the manner in which a groundwater well captures water from an aquifer?

WITNESS BUCHHOLZ: Yes.

MR. FERGUSON: Okay. Does a well preferentially pull water from areas that provide the majority of recharge to a basin?

WITNESS BUCHHOLZ: Not as an individual well. This is all part of the overall groundwater flow within an aquifer system.

MR. FERGUSON: So groundwater pumping in the South American sub-basin could pull water from the west

side of the basin just as well as the east, correct?

WITNESS BUCHHOLZ: Not necessarily. It depends on where the location of the wells are.

MR. FERGUSON: But it could?

WITNESS BUCHHOLZ: There could be wells looking at the groundwater contours that would be affected both by groundwater recharge from the east and the rivers as well as groundwater flows from the Sacramento River, yes.

MR. FERGUSON: Okay. So then could a change in the stream aquifer interaction between the basin and the river, say, alter the availability of water to wells in the South American sub-basin?

WITNESS BUCHHOLZ: When we looked at the -- how would that groundwater change from the river, one of the things, as I spoke already earlier today, is the concern that of the -- of the location of the intakes and what we feel that the groundwater recharge would continue around the intakes. We also looked in the -- in the figure from the Sacramento Central County -- Central Groundwater Authority Basin's management report for 2009 to 2010.

They showed that the -- the -- or the groundwater elevations are much steeper coming in from the eastern side of the basins and also from the rivers.

And it's flatter compared -- as the groundwater contours go towards the river.

And so that the majority of the groundwater flows are going to be from the -- from the steeper side of the slopes towards the center of the central basin. There are going to be wells that could be affected adjacent to the river, and that's what we have said. They could have effects of zero to 5 feet.

We do not believe that those were -- we believe that those are less than significant for the time frames that it occurs in the model.

MR. FERGUSON: Okay. I want to address your point about the east side being steeper than the west side. In particular, a statement you make on page 4, and then page 19, where you say: "The groundwater within an aquifer flows from higher elevations to lower elevations, and the rate of flow will increase along steeper elevation changes, for example, areas with contour changes occurring with the least amount of horizontal space."

So is it always the case that the flow will increase along steeper elevation changes?

WITNESS BUCHHOLZ: That's the -- what we're speaking to, I believe, is Attachment 2 in my -- I don't know if you have the figures in this one, but if not, it

should be in DWR Exhibit 80, page 14.

MR. FERGUSON: Yeah, they're there, I believe.

WITNESS BUCHHOLZ: If we could go down to page 14 of this exhibit.

That one. So you can see on the eastern side, it's sort of the inverse of a topographic from the mountain slopes. This is the inverse that the groundwater moves faster because that's -- the level of steepness is higher as those topographical -- as those groundwater elevations are closer together. And the area it moves forward is actually a pocket of depression in Elk Grove there on top of Highway 99 area.

In this area here, so that the groundwater levels are moving down towards that area. Here we have areas -- the river is right along in here along 160. The elevations are located pretty much at a flatter area towards the west.

So this area is showing there's more groundwater flow just like there will be similarly if this was a mountain and the river was going down the other way.

MR. FERGUSON: So I believe your answer to the question is that it's generally the case that there will be greater flow where the contours are steeper, you're saying yes?

WITNESS BUCHHOLZ: And also, because as I read in the document, there was significant steeper groundwater elevations but there was also greater groundwater source on that to be able to move over those elevations, yes, both the flow --

MR. FERGUSON: Does the hydraulic conductivity in the soil play a part in that scenario?

WITNESS BUCHHOLZ: Hydraulic conductivity does play a part. That's when I looked at both this document and the -- the previous document. If I can ask Mr. Baker to go up one page.

Sort of sideways but this was from the central -- the 2006 Central Sacramento County groundwater management plan, looking at, in total, the recharge sources over half -- from the rivers and streams and moving to the right, the Sacramento River was a smaller portion of those rivers and streams.

And so we believe that that represents, basically, about 6 percent of the total groundwater recharge in the basin based upon these reports.

MR. FERGUSON: I heard you say hydraulic condensating plays a part.

WITNESS BUCHHOLZ: It certainly does, and that was addressed in these reports prepared by Sacramento County.

MR. FERGUSON: You're suggesting to generate the results of the flow contribution.

WITNESS BUCHHOLZ: Yes.

MR. FERGUSON: Okay. I have no further questions.

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

Before we take our break, I think the next group, I believe Group 7, is asking for cross-examination, correct?

The next group I have is 15. Is there any cross-examination by Groups 8, 9, 10, 11, 12, 13, or 14?

Seeing none, with that, we will take a break until 11:10. And then when we come back, East Bay Utility District, please come forward for cross-examination.

(Off the record at 10:58 a.m. and back on the record at 11:10 a.m.)

CO-HEARING OFFICER DODUC: Please take a seat. It is 11:10, we are resuming.

Cross-examination by Group No. 15, East Bay MUD. Your estimate, Mr. Etheridge, was for 45 to 50 minutes. So not that you need to stick to that, but if you can finish quicker, even better. In that case, then, we will take our lunch break after you finish.

MR. ETHERIDGE: Thank you very much.

MR. HITCHINGS: Excuse me, Hearing Officer Doduc. I don't think you could see me up here. Andrew Hitchings for GCID and Biggs-West Gridley Water District.

Just a procedural question for timing purposes for the afternoon. I understand there was some discussion during the break with regard to the panel attendance. And we're just trying to get a sense of which witnesses will be available and whether the entire panel will be here for Panel 2 if we get to that point.

CO-HEARING OFFICER DODUC: Since I was not privy to the discussion during the break, Mr. Mizell?

MR. MIZELL: Certainly. So as we indicated in response to the initial release of Attachment B, Ron Milligan will be appearing by himself, and he is prepared to attend this afternoon at 3:00 p.m.

CO-HEARING OFFICER DODUC: Mr. Milligan was on Panel No. 2?

MR. MIZELL: He was indicated on Panel 2 and Attachment B. We sent in a clarifying letter saying he would be appearing by himself ahead of the remainder of Panel 2. And so Ron Milligan will be our next witness to the stand.

CO-HEARING OFFICER DODUC: Mr. Hitchings?

MR. HITCHINGS: That's fine. We will by prepared from the Sac Valley Water User Group to proceed with cross if we get to that point.

CO-HEARING OFFICER DODUC: Okay. Thank you.

Mr. Etheridge.

MR. ETHERIDGE: Fred Etheridge from the Office of General Counsel of the East Bay Municipal Utility District. For the court reporter's benefit, I may refer to the East Bay MUD. That's the acronym for municipal utility district.

Mr. Bednarski, you testified --

CO-HEARING OFFICER DODUC: Hold on. Hold on. I forgot again. Mr. Etheridge, the points you will be covering?

MR. ETHERIDGE: Thank you.

I intend to cover, first, some questions on the tunnel examples in Mr. Bednarski's rebuttal testimony.

The next category would be the ARUP memo, which is one of the Department's rebuttal exhibits. I have several subcategories that I will question on that memo, including tunnel pressure dynamics, ground surface, groundwater surface, and then move on to the tunnel seals in the tunnel and, last, tunnel interference.

CO-HEARING OFFICER DODUC: Please proceed.

--o0o--

CROSS-EXAMINATION

MR. ETHERIDGE: Mr. Bednarski, you testified earlier this morning that your rebuttal testimony comprises examples of nine other large-diameter tunnel projects throughout the world; is that correct?

WITNESS BEDNARSKI: That's correct.

MR. ETHERIDGE: One of those tunnel examples in your testimony was the Bay Tunnel in San Francisco; is that correct?

WITNESS BEDNARSKI: That's correct.

MR. ETHERIDGE: The Bay Tunnel is a pressurized water tunnel, correct?

WITNESS BEDNARSKI: Yes, it is.

MR. ETHERIDGE: The California WaterFix project's dual main tunnels will be pressurized as well; is that correct?

WITNESS BEDNARSKI: That is correct.

MR. ETHERIDGE: The Bay Tunnel is constructed as a concrete tunnel. Then in addition, inside that tunnel, there is a second layer consisting of a steel pipeline to convey the water; is that correct?

WITNESS BEDNARSKI: Yes, it is.

MR. ETHERIDGE: So it is what is referred to

as a two-pass tunnel, is it not?

WITNESS BEDNARSKI: That's correct.

MR. ETHERIDGE: And to confirm, you noted earlier that while they will be pressurized tunnels, the project's dual main tunnels are proposed to be a single-pass system; is that correct?

WITNESS BEDNARSKI: That's correct.

MR. ETHERIDGE: So they're not proposed to have a steel pipeline inside the concrete tunnel as the Bay Tunnel has, correct?

WITNESS BEDNARSKI: Correct.

MR. ETHERIDGE: One of your other examples was the Lee Tunnel in the London; is that correct?

WITNESS BEDNARSKI: Yes, it is.

MR. ETHERIDGE: Do you consider the Lee Tunnel to also be a two-pass tunnel?

WITNESS BEDNARSKI: It may be. I'm not sure if it is or not. I haven't visited that tunnel.

MR. ETHERIDGE: Are you aware that it is constructed with precast concrete segments for one layer and then, in addition, it has a secondary lining inside the tunnel?

WITNESS BEDNARSKI: It may be. As I said, I wasn't -- I'm not sure.

MR. ETHERIDGE: Okay. Thank you.

You mentioned in response to a question this morning the Blue Plains Tunnel in Washington, D.C.; is that correct?

WITNESS BEDNARSKI: Yes.

MR. ETHERIDGE: Is the Blue Plains Tunnel significantly smaller than the dual main tunnels at only 23 feet inside diameter as opposed to the project's 40-foot inside diameter tunnel?

WITNESS BEDNARSKI: It's smaller.

MR. ETHERIDGE: From your list of nine tunnel examples, can you point to a large-diameter tunnel with a 35- to 40-foot or greater inside diameter that is a pressurized conveyance constructed in soft ground with a single-pass lining system?

WITNESS BEDNARSKI: I'm not aware of one.

MR. ETHERIDGE: Okay. Thank you.

Five of your nine tunnels are transportation tunnels; is that correct?

WITNESS BEDNARSKI: That's correct.

MR. ETHERIDGE: Now, are transportation tunnels pressurized?

WITNESS BEDNARSKI: No, they would not be considered pressurized.

MR. ETHERIDGE: Thank you.

Do you know with road tunnels can matters such

as leakage be observed by inspectors walking or driving through the tunnels?

WITNESS BEDNARSKI: Yes, they can be.

MR. ETHERIDGE: How will the dual main tunnels be inspected?

WITNESS BEDNARSKI: They will, from time to time, be dewatered and individuals will go into those tunnels and inspect them.

MR. ETHERIDGE: Okay. Thank you.

Does an inspection schedule for that work currently exist?

WITNESS BEDNARSKI: Not to my knowledge.

MR. ETHERIDGE: Do you know when it will be developed?

WITNESS BEDNARSKI: I would anticipate during the preliminary final design activities.

MR. ETHERIDGE: Okay. Thank you.

I'd like to turn now to the ARUP memo.

Mr. Baker, if you could please put up EB MUD Exhibit X4. It's the ARUP memo. Thank you.

Mr. Bednarski, I'd like to ask you questions concerning DWR's technical memorandum entitled "Assessment of Potential Water Leakage Rates from California WaterFix Tunnel" prepared by ARUP. I'm going to refer to this memo for short as the ARUP memo.

You refer to the ARUP memo in your rebuttal testimony; is that correct?

WITNESS BEDNARSKI: Yes.

MR. ETHERIDGE: The ARUP memo is a new document dated March 17, 2017, is it not?

WITNESS BEDNARSKI: Yes, it is.

MR. ETHERIDGE: Okay. Chair Doduc, I don't know if this is appropriate time to do so or not, but we do have an objection to this document. I know in terms of the timing of objections, the State Board was very clear that the timing, you don't file them before this phase of the hearing begins nor after the point where they're admitted into the record. So I don't know if right now is an appropriate time just to lodge --

CO-HEARING OFFICER DODUC: You may go ahead and voice your objection.

MR. ETHERIDGE: Thank you.

We will object to the introduction of DWR-659, the ARUP memo, as well as pages 18 to 28 of Mr. Bednarski's testimony where he repeats segments of that ARUP memo, as well as page 46 of his PowerPoint which summarizes the points from the memo, on the basis that the memo's authors -- and I may misstate their names -- Mr. Vasilikou and Mr. Chendorain, are not being presented here as witnesses. The area being proffered

for the truth of the matter stated therein, there's been no foundation laid an the authors are unavailable to us.

So therefore we make that objection. We'd be happy to include the matter in our closing brief for Part I if that's the appropriate place to do so.

CO-HEARING OFFICER DODUC: Any initial response to that objection?

MR. MIZELL: Certainly.

Mr. Bednarski is before you as an expert. He can rely upon the opinions of others by being an expert. This memo is a public document that has received review and, therefore, it is a proper basis for his opinion.

Strict hearsay rules don't necessarily apply in all cases to this hearing. And, therefore, an objection strictly based on hearsay is not necessarily going to carry the weight that it would in front of a Court.

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

We will take this under consideration and issue our ruling at the time that the petitioners move their objections into the record.

MR. ETHERIDGE: Okay. Thank you.

Turning to the ARUP memo, is DWR now relying on the findings of the ARUP memo?

WITNESS BEDNARSKI: Yes, we are, at this point to characterize the anticipated either inflows or exfiltration, leakage, from the tunnels.

MR. ETHERIDGE: And that memo includes leakage estimates for the dual tunnels; is that correct?

WITNESS BEDNARSKI: That's correct.

MR. ETHERIDGE: I'll begin with some questions concerning pressure dynamics.

Is external pressure important in keeping pressure on the joints of a precast concrete tunnel?

WITNESS BEDNARSKI: It's one of the factors that you would use to keep compression on the tunnel, yes.

MR. ETHERIDGE: And is it important because it keeps the segments of the concrete tunnel's gasketed joints compressed together to minimize leakage?

WITNESS BEDNARSKI: Yes, it does assist in doing that.

MR. ETHERIDGE: Thank you.

And the internal tunnel pressures are important as well in considering leakage; is that correct?

WITNESS BEDNARSKI: Yes, they are.

MR. ETHERIDGE: Is that because if internal pressures are too high in relation to the external

pressures on the tunnel, concrete joints and segmented tunnel may push apart and leakage may result?

WITNESS BEDNARSKI: That would be the concern, yes.

MR. ETHERIDGE: I'll like to ask Mr. Baker to turn to page -- ARUP memo, EB MUD Exhibit 64.

Mr. Bednarski, could you please read the highlighted sentence on page 14?

WITNESS BEDNARSKI: "The net load on the segmental lining is anticipated to be external with the confining pressure of the soil and external groundwater providing a higher load than the internal water pressure."

MR. ETHERIDGE: Thank you. I'll have other excerpts going forward, and you don't need to read them into the record. I just want you to read them before I ask you questions.

So does this mean that to avoid leakage from a precast concrete segment, the confining pressure of the soil and external groundwater must provide a higher load than the tunnel's internal water pressure?

WITNESS BEDNARSKI: Sorry. Could you repeat your question?

MR. ETHERIDGE: Sure. Does this statement mean that to avoid leakage from a precast concrete

segment tunnel, the confining pressure of both the soil and the external groundwater must provide a higher load than the tunnel's internal water pressure?

WITNESS BEDNARSKI: That would be an optimum condition to minimize leakage, would be to have the external pressure higher than the internal pressure.

MR. ETHERIDGE: Okay. Thank you.

So to perform leakage calculations, would it be important to use correct external pressures on a tunnel caused by soil and groundwater as well as a correct calculations of internal tunnel pressure?

WITNESS BEDNARSKI: Yes, it would be.

MR. ETHERIDGE: Turn now to ground surface elevation.

I would request, Mr. Baker, please, turn to page 10 of the ARUP memo, EB MUD Exhibit X4.

Mr. Bednarski, do you see Figure 5 projected on the screen?

WITNESS BEDNARSKI: Yes.

MR. ETHERIDGE: Can you see the ground surface profile shown in Figure 5 depicted by the brown line identified in that legend as ground surface?

WITNESS BEDNARSKI: Yes.

MR. ETHERIDGE: Do you see on the right side of that figure, we've highlighted an island in the upper

right? Do you see that?

WITNESS BEDNARSKI: Yes.

MR. ETHERIDGE: Do you know, is that Woodward Island?

WITNESS BEDNARSKI: It would appear to be. Although it's not labeled, it's in about the right location.

MR. ETHERIDGE: If you drop down to the brown line showing the ground surface elevation, is this depicting that the ground surface on Woodward Island is above zero MSL?

(Reporter request for clarification.)

MR. ETHERIDGE: MSL. That's an abbreviation for mean sea level.

WITNESS BEDNARSKI: Yes, it would appear to be that way.

MR. ETHERIDGE: In looking at the right scale on that lower figure, which is elevation, it has a zero and then a 50 feet; is that correct?

WITNESS BEDNARSKI: On the Y axis?

MR. ETHERIDGE: Right.

WITNESS BEDNARSKI: Yes.

MR. ETHERIDGE: So could you make an estimate of what this figure depicts the ground surface elevation to be on Woodward Island?

WITNESS BEDNARSKI: I would approximate 5 to 10 feet.

MR. ETHERIDGE: Thank you.

Is that correct? Is the ground surface elevation on Woodward Island well above 0.0 MSL?

WITNESS BEDNARSKI: I don't have a personal knowledge of what it is.

MR. ETHERIDGE: Are you aware that land subsidence is an ongoing problem in the delta?

WITNESS BEDNARSKI: Yes.

MR. ETHERIDGE: I request Mr. Baker to put up EB MUD Exhibit X5. Thank you.

Mr. Bednarski, on the screen, we are projecting a title page of a DWR document entitled "Technical Memorandum, Delta Risk Management Strategy DRMS, Phase 1," dated May 15th, 2008.

Do you see that page?

WITNESS BEDNARSKI: Yes, I do.

MR. ETHERIDGE: Thank you.

I'll ask Mr. Baker to please turn to the next page. This is figure -- Mr. Bednarski, on the screen, we're now projecting Figure 2-10 from the DWR DRMS technical memorandum.

Do you see that?

WITNESS BEDNARSKI: Yes, I do.

MR. ETHERIDGE: The figure is a surface elevation map; is it not?

Actually, if you scroll down, Mr. Baker, you can see the highlighted title in the lower right of that figure.

WITNESS BEDNARSKI: That's what it's identified as, yes.

MR. ETHERIDGE: Does it depict the surface elevations of various islands in the delta?

WITNESS BEDNARSKI: Yes, the islands are called out there generally.

MR. ETHERIDGE: Do you see Woodward Island on the map?

WITNESS BEDNARSKI: Yes, I do.

MR. ETHERIDGE: And do you see that it's shaded that medium blue? Much of that island, Woodward Island, is shaded medium blue?

WITNESS BEDNARSKI: Yes.

MR. ETHERIDGE: Does that color correspond to the elevation of minus 15 to minus 10 feet below MSL according to the legend on the map?

WITNESS BEDNARSKI: Yes, according to this legend.

MR. ETHERIDGE: So based on this DWR map which depicts most of Woodward Island as being minus 15 to

minus 10 feet below MSL, would you say it is accurate to depict Woodward as being well above MSL as the ARUP memo does in its Figure 5?

WITNESS BEDNARSKI: Comparing these two, no, I would not say that based on the comparison of this figure with what's shown on the ARUP.

MR. ETHERIDGE: Thank you.

Would you say it is accurate for the ARUP leakage analysis to assume groundwater level elevation to be at 0.0 MSL when the actual ground surface on Woodward Island is about 15 feet below MSL?

WITNESS BEDNARSKI: If that is indeed the ground surface elevation, then I would say no, that would not be correct. But I don't have an independent way to verify that.

MR. ETHERIDGE: Okay. Thank you.

Are you aware that EB MUD conducts ground surface profile surveys for the Mokelumne Aqueduct right-of-way in the delta, including on Woodward Island, and that those surveys find Woodward Island to be about minus 15 feet MSL?

WITNESS BEDNARSKI: No, I am not aware of that.

MR. ETHERIDGE: Okay. Thank you.

I want to turn now to groundwater surface

elevation. The groundwater surface elevation also is a factor in external load on a tunnel?

WITNESS BEDNARSKI: It does, yes, play a contributing factor, yes.

MR. ETHERIDGE: Okay. Thank you.

Mr. Baker, could you please turn to page 6 in the ARUP memo identified as EB MUD X4.

Mr. Bednarski, if you'd read to yourself the highlighted sentence from the first bullet point on page 6.

(Witness reviewing document.)

WITNESS BEDNARSKI: Yes.

MR. ETHERIDGE: So in its design of the dual main tunnels, DWR is now assuming groundwater surface elevation is 0.0 MSL; is that correct?

WITNESS BEDNARSKI: For this purpose of this study, yes.

MR. ETHERIDGE: And what is the purpose of this study overall?

WITNESS BEDNARSKI: It was to estimate the potential for either leakage or inflows into the tunnels under the current design concept.

MR. ETHERIDGE: Okay. And in that, in that leakage analysis, DWR is assuming groundwater surface elevation is at 0.0; is that correct?

WITNESS BEDNARSKI: That is what's stated here, yes.

MR. ETHERIDGE: And this assumption at groundwater at 0.0 MSL was also made in DWR's 2015 conceptual engineering report identified as DWR-212; is that correct?

WITNESS BEDNARSKI: Yes.

MR. ETHERIDGE: And, in fact, the ARUP memo notes that fact in that highlighted sentence, stating that its consumption is consistent with the CER; is that correct?

WITNESS BEDNARSKI: Yes, it does.

MR. ETHERIDGE: And are you aware that this assumption of groundwater at elevation zero is a change from the assumption used in the 2012 Jacob Associates' estimates prepared for the project's dual main tunnels?

WITNESS BEDNARSKI: Yes, I'm generally aware of that.

MR. ETHERIDGE: I'd ask Mr. Baker to turn to page 2 of this exhibit, of the ARUP memo. Only page 2.

Mr. Bednarski, if you take a moment to look at the highlights of that last page of the highlights of the ARUP memo.

WITNESS BEDNARSKI: Yes.

MR. ETHERIDGE: So in its 2012 analysis,

Jacob Associates assumed the groundwater elevation was minus 5 feet below groundwater; is that correct?

WITNESS BEDNARSKI: According to this memo here, yes.

MR. ETHERIDGE: But ARUP is now assuming the groundwater is 0.0, correct?

WITNESS BEDNARSKI: Yes.

MR. ETHERIDGE: Do you know why that change in assumptions was made?

WITNESS BEDNARSKI: We wanted to be consistent with the CER of documents and what was assumed in the -- as groundwater elevations and ground contours.

MR. ETHERIDGE: Okay. Thank you.

I would ask Mr. Baker to turn to page 5 of the ARUP memo.

Mr. Bednarski, if you could just read to yourself, become familiar with the first highlighted sentence on the top of page 5.

(Witness reviewing document.)

WITNESS BEDNARSKI: Yes.

MR. ETHERIDGE: Now, does this statement reflect your understanding as well that the tunnel alignment is within an agricultural area for groundwater generally maintained to maintain groundwater levels below crop root zones?

WITNESS BEDNARSKI: That's what it states, yes.

MR. ETHERIDGE: And such groundwater doesn't protect crops because if groundwater was too high, it would flood the crop root zone?

WITNESS BEDNARSKI: I don't know why it would be held low, but if that's why they do it, yes.

MR. ETHERIDGE: Thank you.

So if groundwater is managed to be below the root zone, by definition, it is below the ground surface, is it not?

WITNESS BEDNARSKI: In some cases along the alignment, it could be below the ground surface, yes.

MR. ETHERIDGE: Are you aware that the measured piezometer data in these monitored wells on Woodward Island indicates that actual groundwater elevations are as much as 5 feet below the ground surface elevation?

WITNESS BEDNARSKI: No, I was not aware of that information.

MR. ETHERIDGE: Okay. Thank you.

If the actual surface elevation of Woodward Island in the vicinity of one of the dual main tunnels would cross under the Mokelumne Aqueduct is about 15 feet below MSL and the groundwater level is

another 5 feet below that, wouldn't the groundwater surface elevation be about 20 feet below MSL, not at 0.0 MSL as assumed by DWR?

WITNESS BEDNARSKI: It sounds like your math is correct, yes.

MR. ETHERIDGE: Would a difference of 20 feet affect ARUP's memo of leakage calculation?

WITNESS BEDNARSKI: I believe they acknowledge that on page 6 of their memo where it states: "In some cases ground surface elevation is below zero. This is an assumption that may result in minor underestimation of leakage rates and minor overestimated inflow leak."

MR. ETHERIDGE: Is a 20-foot difference what you would characterize as minor?

WITNESS BEDNARSKI: Not necessarily. But you have to run the calculations for that area and see what the hydraulic radiant is in the tunnel and then determine if there is a significant change to the leakage or not.

MR. ETHERIDGE: Okay. Thank you.

Do you think a reduction in the net external groundwater pressure of 20 feet would change the estimated leakage rates of water flowing out of the project's dual main tunnels?

WITNESS BEDNARSKI: It may or may not

depending on the final design of the tunnel liner, how the segments are connected, the amount of the ground on top of the tunnel lining system, which, for this study, I do believe we took take that into account. So all that work would be done during the preliminary design phase in an effort to better estimate what those levels are.

MR. ETHERIDGE: Thank you.

WITNESS BEDNARSKI: Let me add to that. Under the study, they basically assume that it's the groundwater pressure, not the soil, by confinement to the segments.

So when you add the confinement under the ground, it will really confine the segments. And in this case, the 20 feet may or may not make much of a difference.

MR. ETHERIDGE: But at this point, you don't know if it will because those calculations have not yet been done; is that correct?

WITNESS BEDNARSKI: You're correct. We don't know precisely. But logic would tell you that it would probably confine it even further to limit the leakage rate.

MR. ETHERIDGE: Okay. Thank you.

Mr. Bednarski, now let's turn to the

calculation of internal tunnel pressure.

One of the sources ARUP relied on in conducting its leakage estimates was DWR's 2015 conceptual engineering report; is that correct?

WITNESS BEDNARSKI: Yes.

MR. ETHERIDGE: And that report is abbreviated as the CER; is that correct?

WITNESS BEDNARSKI: That's correct.

MR. ETHERIDGE: I'll refer to it that way here.

Volume I of the CER was identified by DWR as Exhibit 212 in its case in chief submitted in the spring 2016; is that correct?

WITNESS BEDNARSKI: Yes.

MR. ETHERIDGE: What is Volume II of the CER?

WITNESS BEDNARSKI: I believe those are the drawings and plan books.

MR. ETHERIDGE: Was Volume II of the CER and the concept drawings included in DWR's submission of the CER as its Exhibit 212 in its case in chief last year?

WITNESS BEDNARSKI: My recollection is it was submitted at some point. Whether it was part of 212 or not, I seem to recall that it was submitted.

MR. ETHERIDGE: Are you aware that it was submitted in March 2017 in the DWR package of rebuttal

testimony and identified as Exhibit DWR-808?

WITNESS BEDNARSKI: I see it on the list there, yes.

MR. ETHERIDGE: Okay. Are the drawings in Volume II important in calculating leakage from the dual main tunnels?

WITNESS BEDNARSKI: They would generally show the conceptual elevation of the tunnel in the ground and its alignment through the delta.

MR. ETHERIDGE: And knowing the elevation in the ground along its path would help in estimating leakage calculations?

WITNESS BEDNARSKI: That would be one of the pieces of information that you'd need, yes.

MR. ETHERIDGE: Didn't ARUP itself rely on Volume II in its work summarized in the ARUP memo?

WITNESS BEDNARSKI: I believe we probably provided them with both volumes when they were doing their work. I don't recall if there's a specific call-out to Volume II in their memo.

MR. ETHERIDGE: Do you know when ARUP was provided Volume II of the CER?

WITNESS BEDNARSKI: No, I do not. It would have been last fall sometime when we commenced the work with them on this effort.

MR. ETHERIDGE: Okay. Thank you.

Now, in terms of internal pressures, are the internal pressures assumed by ARUP based on an average operating scenario?

WITNESS BEDNARSKI: That would be my recollection. I don't have a specific, you know, memory of what we gave them, but that's probably what we would have asked them to do.

MR. ETHERIDGE: Do you know if different operational scenarios were assumed for the ARUP leakage calculations and for the infiltration calculations?

WITNESS BEDNARSKI: Different operational scenarios would not make much of a difference. As long as the tunnel is full, the internal pressures would basically be the same.

MR. ETHERIDGE: But would there be variations in operations where you might get spikes in internal tunnel pressure?

WITNESS BEDNARSKI: There could be a surge that would occur in the system, but those would be like instantaneous surges lasting milliseconds.

MR. ETHERIDGE: Would such surges put pressure on the tunnel joints and the gaskets sealing those joints?

WITNESS BEDNARSKI: It could put pressure on

the -- on the segments.

MR. ETHERIDGE: But such surges weren't evaluated by ARUP because it assumed average operating conditions; is that right?

WITNESS BEDNARSKI: It did not take into account the spike.

MR. ETHERIDGE: Okay. Thank you.

Ask staff to put up EB MUD Exhibit X6 -- it's excerpts from the CER report -- and turn to page 69.

CO-HEARING OFFICER DODUC: What page is that?

MR. ETHERIDGE: Go up.

Mr. Bednarski, does the highlighted sentence means that, at times, the system will operate under gravity flow so that pump operations at the Clifton Court Forebay pump plant will be halted and North Clifton Court Forebay will be fed by gravity?

WITNESS BEDNARSKI: Yes, that was the intent of that text there.

MR. ETHERIDGE: Okay. Now, was this scenario considered in ARUP's tunnel leakage estimates?

WITNESS BEDNARSKI: I don't know.

MR. ETHERIDGE: Okay. Do you know if this scenario was considered in ARUP's net internal tunnel pressure estimates?

WITNESS BEDNARSKI: Same answer.

MR. ETHERIDGE: Okay. Thank you.

I would ask Mr. Baker to please turn to page 1143 of this same exhibit. It's EB MUD Exhibit X6.

Mr. Bednarski, projected on the screen is page 1143 from DWR CER.

Do you see that?

WITNESS BEDNARSKI: Yes, I do.

MR. ETHERIDGE: The highlighted text on the top of that page states that the maximum static head is plus 15 feet MSL; is that correct?

WITNESS BEDNARSKI: Yes, that's what it states.

MR. ETHERIDGE: Do you know if ARUP's leakage estimates considered these maximum static head conditions?

MR. BEZERRA: I believe they did.

MR. ETHERIDGE: Next topic of questions concerns the tunnel segments and the seals between those segments.

Mr. Bednarski, do you agree that the actual groundwater elevations are lower than the elevations assumed in the ARUP memo, the tension on the dual main tunnel concrete segments will increase and potentially reduce gasket compression?

WITNESS BEDNARSKI: I don't necessarily agree.

I believe, as Mr. Valles said, that during preliminary design, we'll be taking into account both the ground loading and the groundwater loading and designing the tunnel lining system around both of those factors together.

As Mr. Valles stated for this study, we negated the impact of the ground surface because we did not have good geotechnical information throughout the alignment and relied solely on the water surface elevation.

MR. ETHERIDGE: Thank you.

Have hoop tension loads on the precast concrete segments been considered in DWR's conceptual design?

WITNESS BEDNARSKI: There are connectors that do create a hoop tension that bring the segments into confinement, and that would also help to confine the water pressure and to keep the gaskets in compression. For the purposes of the water study, those were not considered.

MR. ETHERIDGE: Okay. Would you agree that a key component in avoiding tunnel leakage is for good connections to be used to hold the segmental rings together for the life of the project?

WITNESS BEDNARSKI: Yes, absolutely.

MR. ETHERIDGE: What will these connections be for the project's dual main tunnels?

WITNESS BEDNARSKI: They're actually detailed in the CER in Volume II.

MR. ETHERIDGE: Do you know -- were they a system of tension-resisting bolts as depicted in DWR Exhibit 808?

WITNESS BEDNARSKI: If that's a -- Volume II, that's correct.

MR. ETHERIDGE: Okay. Thank you.

Mr. Bednarski, your testimony provided the tunnel segment connections will be designed to ensure that gaskets remain adequately compressed when internal water pressure is applied; is that correct?

WITNESS BEDNARSKI: Yes, that's correct.

MR. ETHERIDGE: Does DWR have any data to provide a 100-year design life of these segment sections?

WITNESS BEDNARSKI: At the conceptual level, we do not. We'll be developing that during preliminary and final design.

MR. ETHERIDGE: Would you agree that if these connections were to fail, there is a potential for the gap between tunnel segments to increase thereby reducing the effectiveness of the gaskets?

WITNESS BEDNARSKI: There is a potential for that. And that's one of the reasons this will be an item that's closely considered during the preliminary and final design.

MR. ETHERIDGE: Okay. Thank you.

Would you also agree that if tunnel gaskets fail or lose effectiveness, the consequences could include soil erosion, hydraulic fracturing, and loss of liner?

WITNESS BEDNARSKI: During the most extreme conditions, yes.

MR. ETHERIDGE: Would you agree that excessive leakage could also lead to development of sinkholes for a tunnel constructed in soft ground?

WITNESS BEDNARSKI: Generally speaking -- and this refers to the previous answer -- yes, that could be the case. But I'm not necessarily saying that under the hydraulics that we have in our system that would necessarily be the case. We haven't looked at that at this point.

MR. ETHERIDGE: Okay. Thank you.

Moving on now to my last category of questions, which is going faster than I thought, this concerns interference with EB MUD's proposed delta tunnels.

In your written testimony, Mr. Bednarski, you reference the proposed EB MUD delta tunnel; is that correct?

WITNESS BEDNARSKI: Yes, we did.

MR. ETHERIDGE: Are you aware that EB MUD will be utilizing a secondary steel pipe liner for its delta tunnel?

WITNESS BEDNARSKI: Yes, we are.

MR. ETHERIDGE: Thank you.

What is DWR's assumed minimum separation distance between the dual main tunnels and the EB MUD delta tunnel to avoid interference and minimize the risk of damage and/or failure?

WITNESS BEDNARSKI: I think that's to be determined. In my testimony, we made a commitment to work closely with EB MUD on the design not only of our facility but also of your upcoming facility, and to work through those details. So it would be speculative at best right now to make any suggestions about what that separation would be.

MR. ETHERIDGE: I'd ask Mr. Baker put up EB MUD X6. Turn to 142. Thank you.

Mr. Bednarski, in the second paragraph, in Section 11.2.6, there's a highlighted section. If you could read that to yourself, please.

(Witness reviewing document.)

WITNESS BEDNARSKI: Yes, I'm aware of that.

MR. ETHERIDGE: From this, is DWR, for its own twin tunnels, assuming a separation distance of two tunnel diameters?

WITNESS BEDNARSKI: That's what this text says, but it only -- this was written because this pertains to the construction sequence when we were anticipating the potential of having both tunnels, parallel tunnels, in construction at the same time.

We wanted to separate them so there wouldn't be any effects from tunneling one tunnel adjacent -- immediately adjacent to the other. It does not refer to tunneling next to an existing facility. This merely separates the tunnel-boring machines and their operations.

MR. ETHERIDGE: Okay. Thank you.

Has DWR developed a plan yet for revising the elevation of its dual main tunnels to avoid a conflict and potential impacts on EB MUD's potential tunnel?

MR. BERLINER: I'm going to object to this line of questioning. We went through this in Part I-A, extensive discussion about these issues, and this is really a Part I-A issue. It's not raised in any of Mr. Bednarski's testimony.

CO-HEARING OFFICER DODUC: Mr. Etheridge?

MR. ETHERIDGE: Follow -- one question relating to the testimony on EB MUD Exhibit 153, which came up after the cross-examination of Mr. Bednarski.

CO-HEARING OFFICER DODUC: How does this relate to Mr. Bednarski's rebuttal testimony?

MR. ETHERIDGE: Well, they're -- rebuttal testimony provides examples of other tunnels that have been built. And it's very relevant in terms of how close construction of the new proposed delta tunnels come to existing structures.

CO-HEARING OFFICER DODUC: I'm not seeing the linkage.

MR. ETHERIDGE: I'll withdraw the question.

Just take a minute to check my notes and see if I have any additional questions.

That concludes my questions. Thank you very much.

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

Next, I believe, is Ms. Meserve.

Is there any cross-examination, just to double-check, by Group 16, 17, 18?

Okay. I don't see any.

Ms. Meserve, you have requested, I believe,

45 to 60 minutes. Rather than break up your cross-examination, let me ask: Ms. Womack, you had only requested 15 minutes. Are you prepared to go now?

MS. WOMACK: I'll try.

CO-HEARING OFFICER DODUC: It's up to you. I don't want you to get up if you're not ready.

I'll take Ms. Womack out of order so we can get through her cross-examination before our lunch break.

And then after Ms. -- actually, after the lunch break, I will want to get an estimate of projected cross-examination of Mr. Milligan. I want to know if it's necessary for petitioners to bring another witness for Panel 2 today.

I don't think so, but I might be surprised.

Ms. Womack.

--o0o--

CROSS-EXAMINATION

MS. WOMACK: Suzanne Womack, North Delta C.A.R.E.S.

Mr. Bednarski, I have questions regarding the pile driving that you've talked about. There's -- of course, there's no injury with pile driving is what I've heard repeatedly.

How do you know there's no damage? Do you

contact people and ask if there's damage? How do you know there isn't damage?

WITNESS PIRABAROOBAN: If you are talking about the projects that we have highlighted in the testimony, yeah, we spoke with the engineers and construction manager who were involved in those projects.

MS. WOMACK: I mean, any time you have pile driving, how do you know that people aren't damaged?

WITNESS PIRABAROOBAN: We will have a monitoring program. We will have settlement monitoring as well as -- actually, that starts even before the construction begins. We will establish the baselines. We will look for any sensitive buildings or any other structure that would have potential impacts and establish the baselines. And then during construction, we would set up monitoring stations to monitor the settlement and also look at those sensitive structures if there are any around the construction sites.

MS. WOMACK: And you do this any time you pile-drive?

CO-HEARING OFFICER DODUC: Ms. Womack, I need to remind you that, unlike cross-examination during the case in chief, cross-examination during rebuttal must focus only on what's in the rebuttal testimony. So your

questioning will have to be more focused.

MS. WOMACK: Okay. I'm just trying to figure out, because my ranch just a month ago was subject to pile driving night and day for emergency purposes.

Nobody contacted either my tenant farmer or my person who lives in the house, where the windows shuddered. They shuddered every time they pounded.

Nobody -- nobody, you know, Clifton Court was shut down. There was an emergency. Nobody spoke with anybody. So there's no injury.

But how do you know that? Because my experience is nobody cares. Nobody contacted us. Nobody said, "Hey, we're going to be pile driving. We're going to have lights on that will keep you up day and night."

CO-HEARING OFFICER DODUC: Ms. Womack, this is not the time for your testimony either.

So please continue with your questioning.

MS. WOMACK: Well, I'd just like to know how you know these things, because I keep hearing that there's no damage, and I keep hearing that, you know, I -- I just don't know what else to say because nobody contacts, so how do you know these things?

I just don't see anything in the -- I don't see anything anywhere that says, "This is how we -- this

is how we take care of people. This is how we -- this is how we know we're not harming people," you know.

I have the reality and my poor people. I don't know -- I don't know where else to say things. So I have that.

CO-HEARING OFFICER DODUC: Anyone wish to provide further assurance?

WITNESS BEDNARSKI: I can't speak for what took place out at Clifton Court recently with those emergency repair operations. But I do know, again, as part of the design and construction enterprise, that we are going to have a very extensive and aggressive outreach program to make sure that as these more visible construction activities take place, that people within the vicinity of the project are noticed and made aware of the timing and duration of these activities that will be going on to avoid those kind of situations that have just been exemplified here.

MS. WOMACK: I would feel better, but I know in 2000 around when CALFED was the big deal, they were going to drive in huge sheets, and they, night and day, pounded. Again, never talked to my parents who were living there --

CO-HEARING OFFICER DODUC: Your question is?

MS. WOMACK: My question is: We have these

assurances, but --

CO-HEARING OFFICER DODUC: Your question to the witness, please.

MS. WOMACK: Is how will you -- how will you make -- how will we make sure you do what you say you're going to do?

MR. MIZELL: Object to that question. And to the extent of continuing to asking the question of how that's been asked and answered at this point.

CO-HEARING OFFICER DODUC: What kind of assurance, actually, would satisfy you, Ms. Womack?

MS. WOMACK: Something where, when something like this happens, there's an emergency and that we're at least notified that when it's pounding night and day and there's big lights on, and they can see they're a half mile from our house -- our 1890's house -- and the windows are shaking -- that somebody gives a darn.

I keep hearing this trust and how we're going to do this. Great. I've lived through 50 years of nobody giving a darn.

CO-HEARING OFFICER DODUC: Thank you.

MS. WOMACK: And so --

CO-HEARING OFFICER DODUC: That's close to testifying. Do you have any further questions on cross-examination?

MS. WOMACK: I have a question and I'm not sure how to state this, so I'll just do my best.

The levee. You are going to take care of the levees. And, again, you assure us you're going to take care of the levees, at -- well -- and, I'm not sure where you're going to take care of the levees because it depends on which of the nine different versions you're going to pick. But the levees at Clifton Court have never been taken care of. And I want to know why they're not included with your rebuttal. I asked you before. But why aren't my levees going to be taken care of? Why haven't you done testing on my levees?

MR. MIZELL: I'm going object to the question. As it's stated in your question, it's not in the rebuttal evidence, which means the question is out of scope.

CO-HEARING OFFICER DODUC: Do you have any -- you can -- it's out of scope.

Do you have any information or any response with respect to the levee in question? Shouldn't they have an assurance that the levee will not be compromised. Is there anything specifically you can provide with respect to Clifton Court? And if there isn't, then there isn't.

WITNESS BEDNARSKI: Well, to the best of my

knowledge, Clifton Court is a DSOD jurisdictional embankments around Clifton Court Forebays. So we will need to comply with all the DSOD requirements as we're making modifications that are called out in the CER to Clifton Court when we're driving pile, when we're constructing, you know, strengthening embankments, when we're expanding Clifton Court to the south. All of those kinds of things will have to be done under the jurisdiction of the DSOD requirements.

And then also there's numerous commitments within the EIR/EIS in regards to noise and vibration and mitigation. And, you know, we'll be in compliance with those. Those are our objectives for working down there in the Clifton Court area.

CO-HEARING OFFICER DODUC: Ms. Womack, I appreciate your frustration, but I believe I have allowed you as much latitude as I can with respect to rebuttal cross-examination.

MS. WOMACK: Well, thank you so much for your time. I appreciate it. I'm just trying to get my levees taken care of and somebody to do boring and stuff. I mean, I -- I don't know how you can know by looking that my levees are great. I have a mile of levees that only my ranch takes care of. And I just don't know how that happens.

But thank you so much.

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

With that, we will take our lunch break. And when we resume at 1:00 o'clock, we will ask Ms. Meserve to conduct her cross-examination. But before she does, again, I would like to get an estimate in terms of cross-examination for Mr. Milligan.

Thank you. See you at 1:00 o'clock.

(Whereupon the luncheon recess was taken at 11:59 a.m.)

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APRIL 25, 2017 AFTERNOON SESSION 1:00 P.M.

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CO-HEARING OFFICER DODUC: Please take your seats. It's 1:00 o'clock. We're resuming.

And before Ms. Meserve comes up, can I get a quick estimate as to who all intend to conduct cross-examination of Mr. Milligan?

Ms. Akroyd. Ms. Nikkel. Mr. Bezerra. Mr. Jackson. Okay.

Chances are very good that we will take at least the rest of today. That's all I wanted to know.

Mr. Bezerra -- assuming that you all are not doing five quick -- Mr. Bezerra.

MR. BEZERRA: Yes, thank you.

In terms of scheduling the rest of Panel 2, we on the cross-examining side have a little confusion about that.

Among other things, Mr. Munevar -- there was a previous statement that he was not available at all this week. We seem to be getting to Panel 2 rather quickly, so we need to know who's coming up. And if Mr. Munevar is not until next week, then we know that at least. It would be great if we could have a schedule of who's coming up. But after Mr. Milligan, you know, it's uncertain.

CO-HEARING OFFICER DODUC: Fair point, Mr. Bezerra.

Mr. Mizell, after Mr. Milligan, who is next?

MR. MIZELL: Panel 2 will start with the water quality experts: Mr. Bryan, Ms. Preece, and Mr. Owen.

CO-HEARING OFFICER DODUC: That would be the next panel after Mr. Milligan?

MR. MIZELL: First group of Panel 2, yes.

CO-HEARING OFFICER DODUC: Mr. Jackson.

MR. JACKSON: Yes. I -- is that the panel -- then we should prepare to cross-examine that group of people, and there won't be a substitution? The others will come after that them?

CO-HEARING OFFICER DODUC: Mr. Mizell, I'm expecting others will come back tomorrow; is that correct?

MR. MIZELL: Everybody listed in Panel 2 will appear with the potential exception of Kristin White, depending upon timing. And we recognize that if Kristin White does not appear, that her testimony will not be entered into evidence, but that would be a conscious decision on our part.

CO-HEARING OFFICER DODUC: Ms. Meserve. See, I still remember all your names.

MS. MESERVE: Osha Meserve for Land.

I guess I would request that since this seems a bit different than what DWR in their last correspondence gave us, that behemoth Group 2, which included a whole bunch of different topics, it sounds like in reality those are going to be divided into maybe three or four panels which I do not object to.

But I would request that DWR provide an additional written correspondence laying out which witnesses are going to go in which panel so that we may prepare accordingly.

MR. MIZELL: I think it's simple enough. You'll start with the water quality experts on Thursday, should we get to them, or Friday, and the witnesses that will appear directly following that will be the remainder of those listed for the Panel 2 with the possible exception of Kristin White.

CO-HEARING OFFICER DODUC: Panel 3 will follow Panel 2?

MR. MIZELL: That's correct.

MS. MESERVE: Then you have modeling is separate and then water quality. You also have salinity in what you call Panel 3. So I think it's a little less clear than you might think when you're on our end trying to prepare questions. The order really matters.

CO-HEARING OFFICER DODUC: And I believe

Mr. Mizell has provided us with that order.

Mr. Mizell, please walk us through, again, by naming the names of your specific witnesses. Your Panel 2 consists of, I believe, eight or nine witnesses which you are now breaking into subpanel, and please specify to everyone so that there's clear understanding. Mr. Milligan will be your first witness.

Next will be --

MR. MIZELL: The next witness will be Mike Bryan, Ellen Preece, Doug Owen.

CO-HEARING OFFICER DODUC: That comprises one subpanel?

MR. MIZELL: That's are the water quality experts.

CO-HEARING OFFICER DODUC: Next?

MR. MIZELL: Next group will be starting with John Leahigh, Armin Munevar, Nancy Parker, Parviz Nader-Tehrani, Chandra Chilmakuri, and Maureen Sergent.

CO-HEARING OFFICER DODUC: And they will comprise one panel, one subpanel?

MR. MIZELL: Panel 3, as designated in our last written correspondence, will be Joel Kimmelshue and Chris Thornberg.

CO-HEARING OFFICER DODUC: All right.

Mr. Bezerra?

MR. BEZERRA: Yes, thank you. I appreciate the clarification. There is still remaining some ambiguity there.

The panel that Mr. Mizell just described as including Mr. Munevar, previously, the petitioners indicated Mr. Munevar is not available until next week.

So does that mean that the panel will not testify before next week, or are we preparing for that panel this week if we get to it following the water quality experts?

CO-HEARING OFFICER DODUC: Mr. Bezerra, I cannot give you give you nor can I give petitioners what they requested, a time certainty as to when certain witnesses will appear before us.

What Mr. Mizell has outlined is the order upon which his witnesses will appear. And depending on how succinct you all are at cross-examination, those panels may appear sooner or later in that order.

And if it happens that we get to the panel that Mr. Nader -- Dr. Nader-Tehrani is on this week, then I would expect him to appear this week. If it's next week, then I would expect him to appear next week.

MR. MIZELL: Thank you. I appreciate that. And I understand. Again, the petitioners previously indicated Mr. Munevar is not available at all this week.

So it appears that we may end up with half a day.

CO-HEARING OFFICER DODUC: No, we will not.

MR. BEZERRA: Okay.

CO-HEARING OFFICER DODUC: If we get to that panel that he should appear and he's not, then he's waived that right.

MR. BEZERRA: Thank you very much.

MR. MIZELL: Hearing Officer Doduc, that is exactly what we intend to do. If they're called, we will produce them in the order that we've just described.

I would like to make one caveat, which I do not expect to occur, but should Ron Milligan go the remainder of this week, we will not have Mike Bryan and we will start with John Leahigh, Armin Munevar, Nancy Parker, et cetera.

So we will start with the remainder of Panel 2 next week. But as you've indicated, it's rather certain we will get to Panel 2 this week. So if we don't get to Panel 2 this week --

CO-HEARING OFFICER DODUC: I expect we will get to Panel 2 this week.

MR. MIZELL: So do I. And so that's the order I've laid out for you this afternoon. If we do not get to Panel 2 this week, the order is slightly different.

But Panel 2 will still go up next.

CO-HEARING OFFICER DODUC: And everyone will have the weekend to prepare for it. That's it.

Ms. Meserve, please come up and start your cross-examination. Are you playing tag team with Mr. Keeling?

MS. MESERVE: Is that okay with you?

CO-HEARING OFFICER DODUC: I would prefer knowing in advance. But since you are not wearing Stanford colors, you are welcome.

Before you begin, though, my counsel has raised an interesting question. Mr. Mizell, when you proposed your humungous Panel 2, we believed it was with the purpose of ensuring that all those witnesses will be crossed together.

MR. MIZELL: And that was --

CO-HEARING OFFICER DODUC: Now that's no longer the case?

MR. MIZELL: It was also part of the request where we had a date certain for the start, and when -- when we chose not to have a date certain, I needed to make certain adjustments in order to --

CO-HEARING OFFICER DODUC: So it's my fault. Thank you very much.

MR. MIZELL: I'm simply indicating to you I'm

trying to do what the board would like. Nothing more.

DANA HEINRICH: Sorry. Your intention then is to offer first Mr. Milligan for cross, and then present your subpanel of water quality witnesses, the three witnesses you listed, and then subject them to cross-examination, and then move on to the remainder of Panel 2?

MR. MIZELL: Yeah. It was my understanding that was the board's preference.

CO-HEARING OFFICER DODUC: Mr. Keeling, please begin.

MR. KEELING: Good afternoon. Tom Keeling for the San Joaquin County Protestants. And my questions will be entirely for Mr. Bednarski. And they will focus -- or shall I say drill down -- only on those -- that part of his testimony concerning other projects that he's described in order to establish the feasibility of this construction project.

CO-HEARING OFFICER DODUC: If you have the opportunity to bring up it up in PowerPoint to show us some pictures, I will not object.

MR. KEELING: I'll give it all due consideration.

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

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CROSS-EXAMINATION

MR. KEELING: Mr. Bednarski, good to see you again.

WITNESS BEDNARSKI: Good afternoon.

MR. KEELING: Mr. Baker, if we could put up Exhibit 75, DWR-75, which is Mr. Bednarski's written rebuttal testimony. Move to page 2, lines 9 through 15.

Mr. Bednarski, could you take a look at that bullet point section entitled, "Large Diameter Tunnel Projects Have Been Successfully Completed Throughout the World."

Do you see that paragraph?

WITNESS BEDNARSKI: Yes, I do.

MR. KEELING: You point out here -- and I'm quoting -- that in each of these cases, successful outcomes were achieved without incurring risk or injury to project stakeholders.

Do you see that language?

WITNESS BEDNARSKI: Yes, I do.

MR. KEELING: As you use the phrase, what does the phrase "project stakeholders" mean?

WITNESS BEDNARSKI: In the context of this testimony, it would be either the client or the contractors or any of the -- to the best of our

knowledge, the surrounding entities that would have come into contact with this project, the particular project.

MR. KEELING: By "surrounding entities," do you mean local farmers?

WITNESS BEDNARSKI: If that applied to a particular tunnel project that we listed in our list -- and I'd be happy to show you that list -- those are the ones that we're referring to.

MR. KEELING: When you say "others who had come in contact," you mean people who have a financial interest in the tunnels or proponents?

WITNESS BEDNARSKI: No. It would be the, you know, to the best of our knowledge, the city and municipalities that directly overlay the tunnel projects that would have been considered critical infrastructure perhaps around these tunnels. That's what we refer to as kind of, in general, the stakeholders, in addition to the project owners, the contractors.

MR. KEELING: As you use the phrase, what do you mean by "successful outcomes"?

WITNESS BEDNARSKI: That they've all been completed successfully; that they were all put into operation for their intended purpose; that, to the best of our knowledge, there were not unforeseen events that overtook these projects that stopped the tunnels from

being completed and put to their intended purpose.

MR. KEELING: If you take a look at -- specifically I'm going to send you to four different lines. First on page 5, lines 12 through 13, having to do with Eurasia Tunnel.

Do you see there that you pointed out that the Eurasia Tunnel was completed within budget? Do you see that?

WITNESS BEDNARSKI: Yes. That's what we have here, yes.

MR. KEELING: And on the same page, Mr. Baker, lines 27 through 28.

Do you see there that the lead tunnel is said to have been brought in slightly under project budget? Do you see that?

WITNESS BEDNARSKI: Yes, that's what's written here.

MR. KEELING: Page 7, Mr. Baker, line 11.

Do you see that the Blue Plains Tunnel is stated as having been brought in under budget?

WITNESS BEDNARSKI: Which line is that on?

MR. KEELING: Line 11.

WITNESS BEDNARSKI: Yes. That's what's written there, yes.

MR. KEELING: Finally, Mr. Baker, page 8,

lines 6 through 7.

And we're told that Bay Tunnel was on time and within budget. Do you see that?

WITNESS BEDNARSKI: Yes.

MR. KEELING: What testimony presented by the protestants in their cases in chief were these statements about the budgetary feasibility of tunnel meant to rebut?

WITNESS BEDNARSKI: I don't believe they were meant to rebut any testimony in our prior -- in our prior testimony.

They were meant to give indication, generally, for tunnel projects completing within a predetermined schedule and a predetermined budget or measure of success for tunneling projects as with other types of infrastructure projects. So they were presented as evidence that these projects were completed successfully.

MR. KEELING: Consistent, I hope, with the instructions of the hearing officers, this is the time I think to both object and move to strike this witness's statements about the budgetary aspects of tunnels on two bases: One, it is outside the scope of rebuttal, and it is also outside the scope of Part I.

In fact, we have been told so by these hearing

officers in this proceeding in other contexts.

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

MR. MIZELL: It is true that during the course of Part I-B, during the other parties' cases in chief, rulings were made that the financial feasibility of the California WaterFix was, indeed, outside the scope of this hearing.

It is my understanding that some of the testimony may not have been revised and resubmitted to reflect that, and these statements are in response to that testimony.

Certainly if there's no basis for these statements in testimony that was actually submitted into evidence, then we would offer to revise Mr. Bednarski's testimony and remove the offending statements.

But I do believe that there are still references in the record to the financial feasibility, despite what Mr. Keeling is talking about, as being a ruling that that is outside the scope of the hearing.

CO-HEARING OFFICER DODUC: And you have until the time that you complete rebuttal and submit your evidence into the record to provide us with those specifics.

We will take the objections under

consideration.

Mr. Jackson, what do you wish to add?

MR. JACKSON: I'm here just to join in the motion. However, I have a specific reason for that. We submitted testimony in regard to the effects of the project on the ratepayers in the Santa Barbara area.

That was moved by the board to Part II under public interest. And it seems to me that we're going to have that debate on financing, but it all ought to be there. Thanks.

CO-HEARING OFFICER DODUC: So noted, Mr. Jackson.

Mr. Keeling, your objection is noted.

Again, Mr. Mizell, you have until the completion and submitting of your exhibits into the record to provide those additional references to which he referred, and we will take it under advisement.

Please continue, Mr. Keeling.

MR. KEELING: Thank you.

Mr. Baker, could you move us to page 5, lines 8 through 21?

Mr. Bednarski, lines 8 through 21 have to do with the Eurasia Tunnel.

Are you there yet?

WITNESS BEDNARSKI: Yes, I see it.

MR. KEELING: You talk about the diameter of this tunnel, but you do not talk about the length. What was the length of this tunnel?

WITNESS BEDNARSKI: Can I bring up my slides?

CO-HEARING OFFICER DODUC: Yes, you may.

WITNESS BEDNARSKI: I want to see those. I believe DWR-6 errata, I think I have a slide on that that specifically going into that. I think it's Slide 8.

So 2.1 miles.

MR. KEELING: Very short compared to the proposed WaterFix?

WITNESS BEDNARSKI: I don't believe I reference this project because of the length of the project. There were other factors that we considered were relevant as far as the basis for comparison.

MR. KEELING: Referring to the description of the Eurasia Tunnel, how do you know this project was completed without -- and I'm using your language from earlier, quote -- "incurring risk or injury to project stakeholders"?

WITNESS BEDNARSKI: We've had discussions with some of the folks that have worked on the design team as well as the construction management team, and we were given no indication that there were any issues. It

would fall into the category that I described as the stakeholders' project participants in that regard.

MR. KEELING: If we were to retrace your investigation and examine your sources of information about the Eurasia Tunnel and the sources of your conclusions about it, what sources would we go to?

WITNESS BEDNARSKI: I believe we spoke with some of the consulting engineers that were involved in the design and the program project.

Do you need a name or -- those would be the level of people that we spoke with, the design engineers and the program management people.

MR. KEELING: Did you review any reports about the outcome of this tunnel?

WITNESS BEDNARSKI: Not any detailed reports other than what is available in the publicly available information on the Internet, in addition to the discussions with the project people.

MR. KEELING: I would like a list of the project people you've spoken to and the contact information. Otherwise, it would be very difficult for somebody to take a deep look at what you've done.

You have that available?

WITNESS BEDNARSKI: I don't have that information available at my hands right now. We'd have

to gather that information. It was not part of my testimony.

MR. KEELING: I appreciate that fact. I don't mean to be confrontational. But if we were to have a meaningful opportunity to review and test the statements made under oath by this expert, we need to have access to the sources of the information.

I realize that Mr. Bednarski does not have that at his fingertips now, but I do ask that the hearing officers direct that that information be provided to us and that we have an opportunity to review it and bring this witness back to discuss what we learn after investigating on the basis of that -- of those sources.

CO-HEARING OFFICER DODUC: Mr. Mizell, Mr. Berliner, your response?

MR. BERLINER: Well, we have to strenuously object to the idea of bringing the witness back. They had plenty of opportunity to request that information from us.

They've had his testimony. If they wanted names, they could have written us a letter, called us up and asked, "Who did you intend to conduct cross-examination in this area? Please provide us with the names of the people that you spoke to in order to

support the statement." They've not done so.

And to come now and ask during the rebuttal phase in cross-examination for discovery information seems way too late. And to ask the witness be brought back seems very inappropriate for something that could have been done before.

MR. KEELING: If I may?

CO-HEARING OFFICER DODUC: Hold on, Mr. Keeling.

Ms. Meserve?

MS. MESERVE: Osha Meserve for Land.

Since this is going to come up in my cross-examine as well, I'd like to weigh in.

I guess I would disagree a tiny bit, but I don't think the time as passed for DWR to put forth the actual evidence behind the findings here. And that if there were discussions that aren't reflected anywhere in the materials they put forth in their rebuttal and they form the basis for the conclusions here, that it's very possible --

You know, I would object to these conclusions being admitted into evidence because they have no foundation, they're not relevant, they're not reliable, they're not any of those things.

And he's admitted on the stand right here that

he doesn't have those writings. So I don't see why we would -- I agree with Mr. Mizell. I think it's too late to bring them in.

CO-HEARING OFFICER DODUC: Ms. Des Jardins?

MS. DES JARDINS: Well, I just wanted to say that if it is too late for discovery, then the question is about what to do about the PCF subpoena I participated in. And there's a very large number -- large amount of information that's relevant for cross-examination of Mr. Munevar which has not been produced.

CO-HEARING OFFICER DODUC: Off topic, Ms. Des Jardins.

Mr. Keeling, you were about to add something?

MR. KEELING: To put this in perspective, I've shown up here to cross-examine an expert witness whose written rebuttal testimony has been proffered to the tribunal.

It is standard procedure, throughout my career at least, that when you cross-examine an expert, you're entitled to cross-examine the expert on what his or her opinions are and what the basis, that is, is the underlying rational and information for those opinions is. That's not a matter of discovery per se. That's a fair question in cross-examination and has been

throughout this proceeding.

CO-HEARING OFFICER DODUC: Mr. Keeling, I would agree you're allowed to ask those questions.

Mr. Bednarski, you will answer the question to the extent that you can. And recognizing that you may not have all the information, I will not be calling Mr. Bednarski back.

But, Mr. Keeling, we will take your objection and carry it toward the weight of the evidence that Mr. Bednarski provides us in this matter.

So your objection is sustained and will go to the weight of evidence.

MR. KEELING: All right. To be perfectly clear, since I did not frame it as an objection, if, in fact, the sources are not made available by this witness's testimony, then I'm going to object that it is hearsay, lacks foundation, and I'm going to move to strike this testimony. In fact, I am now moving to strike to the extent that he cannot produce underlying information.

CO-HEARING OFFICER DODUC: To make this perhaps a little bit simpler, not to put words in your mouth, Mr. Keeling, seems like you are focusing on the part of Mr. Bednarski's testimony regarding other projects, and you're starting to pick apart pieces here

and there. Would suffice to say that you may end up with an objection regarding the entire portion with respect to the other projects?

MR. KEELING: Yes.

CO-HEARING OFFICER DODUC: Then let's note that as the overall objection from Mr. Keeling to which we will respond verbally when we take the petitioners' exhibits under consideration.

MR. KEELING: Thank you very much. And I hope in doing this I have complied with the hearing officer's instructions about the timing of objections and motions.

CO-HEARING OFFICER DODUC: You are doing very well, Mr. Keeling.

MR. KEELING: Thank you.

Focusing still, Mr. Bednarski, on the Eurasia Tunnel and your conclusion that it was a successful outcome and that the project stakeholders, including those around the project, were apparently -- the phrase was that they had not incurred risk or injury to the project stakeholders, going back to that.

Did the legal regime or rules applicable to the construction of Eurasia Tunnel require that construction be approved only after the project proponents established that construction would not result in injury to the local interests?

WITNESS BEDNARSKI: I have no knowledge of that.

MR. KEELING: Did your source materials describe the legal rules of this project?

WITNESS BEDNARSKI: No, we did not discuss the legal rules of the project with my source information.

MR. KEELING: Do you know if there was ever a hearing prior to approval of the project in which potential injury to those in the project was a topic?

WITNESS BEDNARSKI: I have no knowledge of that.

MR. KEELING: Turning now to page 5 at lines 22 through -- is it, Mr. Baker, line 22 of page 5 through line 6 of page 6?

That is the lead tunnel description, Mr. Bednarski. Do you see that?

WITNESS BEDNARSKI: Yes, I do.

MR. KEELING: Did you give us the length of that tunnel at some point?

WITNESS BEDNARSKI: I believe we go back to the slide presentation, we can move to that slide also.

MR. KEELING: And that was for the chairperson's benefit.

WITNESS BEDNARSKI: Moving ahead to page 10 and I think go to the next slide, page 11, I think maybe

that project information listed there on the slide.
4.3 miles.
MR. KEELING: Okay. How did you know this project was completed without incurring risk or injury to project stakeholders?
WITNESS BEDNARSKI: Again, we have met on several occasions with the project team, both the design engineers and the project managers. We also have had some staff visit the site. And in none of those discussions did any injury to stakeholders or anomalies with the project come up.
MR. KEELING: In order to expedite this, I'm going to start, if it's all right with the hearing officers, with the assumption that your answers to the previous tunnel with respect to source materials applies. But if I'm wrong, please correct me.
Is that acceptable?
CO-HEARING OFFICER DODUC: In fact, you anticipated me. Thank you, Mr. Keeling.
Mr. Bednarski, would your answer to similar questions that Mr. Keeling might pose regarding the other tunnels in your testimony be similar?
WITNESS BEDNARSKI: Yes, they would be. We've met primarily with the engineers that designed the tunnel, the project managers for the construction of the

tunnel, and on some occasions, we've -- we've talked with the clients themselves. But that would be the limits of our discussions in making our determinations.

CO-HEARING OFFICER DODUC: And you will be not be familiar with any of the regulatory constraints associated with the approval of those projects?

WITNESS BEDNARSKI: No, I would not.

MR. KEELING: And is that true for all of the tunnels discussed in the written testimony, DWR-79?

WITNESS BEDNARSKI: Yes, I believe it would.

MR. BERLINER: I'm sorry I think that's a very vague question as to what we're talking about now as far as that would be true.

MR. KEELING: I'm happy to go into detail.

CO-HEARING OFFICER DODUC: I understood Mr. Keeling's question to be directed to the -- to the examples that Mr. Bednarski provided in his rebuttal testimony, the tunnels that were included as examples.

MR. BERLINER: The reason I raise it, for instance, one of the tunnels is the San Francisco Tunnel under the Bay. We know the regulatory framework within which that tunnel occurred. They may know the people that they spoke with.

The tunnel -- was it Seattle? We know that there's a regulatory framework in the United States

where the construction may not be the same rules as in California. But we're into a United States-based project environment, so I think that's very different than projects constructed elsewhere.

CO-HEARING OFFICER DODUC: That's true.

Mr. Bednarski, you know that?

MR. BERLINER: I should just clarify, though, because I'm not -- my objection was primarily to the recalling of Mr. Bednarski as a witness. If we can produce the names, we're happy to do so. We're not trying to hide the ball on who we talked to. But the objection was to calling Mr. Bednarski back. If Mr. Keeling wants the names and doesn't mind -- I can't produce them today. If we can have a day or two, you can get them.

WITNESS BEDNARSKI: Yes. If I'm not here on --

CO-HEARING OFFICER DODUC: Thank you for offering that, Mr. Berliner.

MR. KEELING: The point is to cross-examine the witness on it.

MR. BERLINER: Well, it strikes me that's what surrebuttal is for. If you're trying to rebut what Mr. Bednarski is contending, then you have an opportunity to do so, but...

CO-HEARING OFFICER DODUC: Are you suggesting that he call Mr. Bednarski back as his surrebuttal witness?

MR. BERLINER: No, no.

CO-HEARING OFFICER DODUC: I think he might enjoy that.

MR. BERLINER: Well, we can cross that bridge if we get to it. I'm not going to offer an opinion one way or the other on that.

CO-HEARING OFFICER DODUC: Let's do it this way: I appreciate your offer to provide Mr. Keeling with those names. You may do so.

Mr. Keeling, go ahead and ask Mr. Bednarski the questions that you wish to ask him. And to the extent that he is able to answer, he will answer.

MR. KEELING: All right.

CO-HEARING OFFICER DODUC: With that, though, Mr. Bednarski, given what Mr. Berliner said about the Bay project, as well as the Seattle project, are you familiar enough with those projects to the extent that you can answer a detailed question that Mr. Keeling has posed?

WITNESS BEDNARSKI: No, I would not be familiar enough with what the specific requirements were from an environmental or regulatory basis to really

discuss that in detail.

CO-HEARING OFFICER DODUC: Anyone else on the panel?

WITNESS VALLES: We're strictly looking at those projects from an engineering perspective and the feasibility and the soil types and project management type of issues, not the regulatory issues.

CO-HEARING OFFICER DODUC: All right.

MR. KEELING: Mr. Baker, let's go to page 6 to the discussion of the Port of Miami Tunnel, which is at line 7 through 19.

Do you have a length of that tunnel, Mr. Bednarski?

WITNESS BEDNARSKI: I believe if we go to my Slide 13, right there, 4200 feet long times two. So two of them. Same machine was used for both sides. A little bit over a mile.

MR. KEELING: You would concede that's still considerably shorter than the proposed tunnel for the California WaterFix?

WITNESS BEDNARSKI: Yes. But, again, that was not the criteria that was used to deem it a similar project. More the size of the machine that was used, the ground conditions that had to be treated prior to excavation were some of the key reasons why and the fact

that the project was going under a body of water and that was traversed successfully.

MR. KEELING: And I'm going to try my best to push through. In light of Mr. Berliner's comments, I'm not entirely comfortable with a wave-my-wand generalization, but I'll try to be quick.

Mr. Bednarski, if I were to ask you how you know this project was completed without incurring risk or injury to project stakeholders, would your answer be any different than it was on previous tunnels?

WITNESS BEDNARSKI: We spoke with the same types of people -- either the design engineer, the construction manager, or the contractor -- in regards to gathering the information to make that determination.

MR. KEELING: You have no written reports about this tunnel?

WITNESS BEDNARSKI: I did not make written notes on that. Those are from the recollections of several of us either visiting the project site or talking directly with these individuals.

MR. KEELING: And similarly, with the Port of Miami Tunnel, are you familiar with the rules or the legal regime applicable to construction of this tunnel and specifically whether those rules required the construction be approved only after project proponents

established that the construction would not result in injury to interested parties?

WITNESS BEDNARSKI: I'm not aware of what those requirements would be.

MR. KEELING: Moving on to the East Side Access Tunnel, page 6, line 20, extending through page 7, line 5.

Do you have that?

WITNESS BEDNARSKI: Yes.

MR. KEELING: Do you know the length of that tunnel? I didn't see it in your written testimony.

WITNESS BEDNARSKI: We didn't list the length. My recollection is that each one of these would be less than a mile long. There were several of the tunnels. But, again, they were not multi-mile tunnels.

MR. KEELING: Okay.

WITNESS VALLES: Let me add to that. It consisted of four tunnels approximately 30 feet in diameter and overall length of all the tunnels about 2 miles.

MR. KEELING: And, again, with respect to the sources of your information, would your answer with respect to this tunnel differ from your previous answers?

WITNESS BEDNARSKI: We spoke with the same

types of individuals or contracting firms that we did with the other projects.

MR. KEELING: And, again, are you familiar with the rules or legal regime governing approval of this tunnel? And, specifically, did those rules require a showing of no injury to interested parties prior to approval?

WITNESS BEDNARSKI: I'm not personally aware of what those rules would be.

MR. KEELING: And to make it clear, going forward when we get those responses, that's all encompassed within my existing objections and motion to strike. Thank you.

CO-HEARING OFFICER DODUC: Must we repeat this for the other five tunnels?

MR. KEELING: I would like to have a stipulation if it's true for all of them.

CO-HEARING OFFICER DODUC: Mr. Bednarski, those three questions that he keeps repeating ad nauseam, apply them to the remaining five or six tunnels that you have in your testimony. Would your answer differ from any of those tunnels?

WITNESS BEDNARSKI: They might indeed. I guess I'd like to go through those, and I'll point out where they do divert in some cases. In addition to

talking to design engineer and the contractor, we did talk to few owners specifically.

And I can point those out and give you -- again, I don't have written notes from those meetings, but the best of my recollection of what we talked about with those individual is --

CO-HEARING OFFICER DODUC: Well, can we quickly go through them.

WITNESS BEDNARSKI: Sure.

MR. KEELING: Start with that one, Slide 16.

CO-HEARING OFFICER DODUC: I don't think Mr. Keeling need to repeat his questions.

WITNESS BEDNARSKI: No, he does not. I'll just point out where this one is different.

So we've spoken, as I mentioned previously, with the design engineers and the contractors on this. We also met on a couple -- at least two or three occasions with the project owner in regards to this project. We had the director of DC water came out to Sacramento. In fact, gave presentations to the State Water Contractors. This is one of the projects that we highlighted.

And in none of those discussions did any indication of any issues to stakeholders come up that would change our opinion that this was a successful

project.

We did not get into discussions with them, to the best of my recollection, about the rules and regulations that would precede the approval of a project like this.

MR. KEELING: Mr. Bednarski, in your response to the hearing officer's question just now, you once again used the phrase "project stakeholders," this time, in connection with people you actually spoke to. Did those stakeholders include residents in the neighborhood of Crockett?

WITNESS BEDNARSKI: We have not made any contact with residents on any of these projects. Like I said, this is -- we met with the owner of the project here and on a couple others that would be following this one.

MR. KEELING: So by "stakeholders," you're talking about owners, people involved in construction, perhaps government approval. Who else would you be talking about?

WITNESS BEDNARSKI: Well, I think I've kind of listed now through the cross-examination here the individuals and the firms and contacts that we've made. And that's -- that's fairly consistent throughout these different projects.

MR. KEELING: You made no independent effort to interview local businesses?

WITNESS BEDNARSKI: No, we did not.

MR. KEELING: You made no independent effort to speak to local residents or farmers?

WITNESS BEDNARSKI: No, we did not do that either.

MR. KEELING: And you reviewed no interviews of residents or local businesses or farmers?

WITNESS BEDNARSKI: No. And I believe, as I clarified, who I considered to be stakeholders. I've listed those as the designers, construction managers, contractors, and in some cases the owners. So I would be limiting my response to those as the stakeholders that we've talked to.

MR. KEELING: Thank you for that clarification on what you mean by "project stakeholders."

Going on now to DWR-75, page 5.

WITNESS BEDNARSKI: Could I ask a question? Are we assuming now that the rest of the projects on this list that we've either met with some of the individuals that we've talked about or not, or should we finish reviewing that list?

CO-HEARING OFFICER DODUC: I think Mr. Keeling is going to the next tunnel.

WITNESS BEDNARSKI: Okay.

MR. KEELING: I would have been happy not to.

CO-HEARING OFFICER DODUC: Yes, me too.

MR. KEELING: Essentially, I have the same questions for this one. This is the Bay Tunnel.

Mr. Bednarski, are you familiar with the sources for the information underlying your conclusion that there was a successful outcome here? And, if so, tell me what those sources of information are.

WITNESS BEDNARSKI: Again, in similar fashion with the DC Tunnel, in addition to talking to the design engineers, the construction managers, and the contractors on this tunnel, we have met on at least two, possibly three, occasions with the owner. We had this owner come out again and present to a workshop for the State Water Contractors.

That owner, I believe it was the -- one of the deputy directors of SF PUC, San Francisco Public Utilities Commission, expressed that, from their perspective, the project was successful.

MR. KEELING: Did their perspective include, to your knowledge, the perspective of local residents?

WITNESS BEDNARSKI: In this case, I would assume it did, although they did not say specifically and also from the standpoint of meeting their

environmental commitments. That was the takeaway that I got from the discussion that we had with that individual.

MR. KEELING: Going on to the next tunnel which is the -- yes, the Willamette River combined sewer outfall tunnel. Page 8, line 8 through 20.

Are you familiar with the rules or legal regime governing approval of this project?

WITNESS BEDNARSKI: No, I am not.

MR. KEELING: Are you aware if there was any hearing prior to approval in which local residents or local interests were allowed to establish injury or no injury?

WITNESS BEDNARSKI: Not specifically. Although, when we had the project manager from the owner, this was an employee of the City of Portland came out and discussed this project with us. The recollection that I have is that that process of planning, designing, and building these tunnels went very smoothly, and that if they had any issues, they were -- they were ameliorated or taken care of to the extent that they weren't an issue.

But I don't have a specific reference but that, from the owner's perspective, this was a highly successful project.

MR. KEELING: From the owner's perspective?

WITNESS BEDNARSKI: From the owner's perspective. And as I mentioned, the design engineer, the construction manager, and tunnel contractor, those several entities.

MR. KEELING: And you have no -- other than the folks you spoke to, you have no other sources to differentiate this tunnel from the previous tunnels you talked about?

WITNESS BEDNARSKI: I'm sorry?

MR. KEELING: Do you have a report that you're relying on, for example?

WITNESS BEDNARSKI: No. I'm relying on my recollection and from the PowerPoint presentation that was given by the owner at this workshop that we gave for the State Water Contractors. Those -- that would be where, you know, the -- you know, our conclusions that it was a successful project came from.

MR. KEELING: By the way, what is meant by the phrase "TBM breakout"? I know what TBM is, tunnel-boring machine? What is TBM breakout?

WITNESS BEDNARSKI: Yeah.

MR. KEELING: That's at line 16, I believe.

WITNESS BEDNARSKI: Right. TBM breakout is when the tunnel-boring machine completes its tunneling

by actually mining into the shaft that's at atmospheric conditions. From that point, they can either maintain the machine and have it continue on its way through the other side of the shaft or they can pull the machine out if it's completed with its work.

But sometimes they break into the shafts and breakouts are challenging because the differential water pressure on the one side of the shaft to the other which is under atmospheric conditions.

So my recollection was, for this project, that that was challenging for -- for some reasons.

MR. KEELING: Moving on to the Gotthard Base Tunnel, page 8, line 21, through page 9, line 3.

What were the sources of your information regarding the successful outcome and the lack of risk or injury to project stakeholders?

WITNESS BEDNARSKI: On this project, primarily we've done research either through technical conferences that have been given on this project, through sources available on the Internet to gather the information and the specifics about the project and the timing in which it was completed and the details that would, again, be taken as evidence that this program was completed successfully.

MR. KEELING: In other words, you relied on

the same sources you talked about with respect to other tunnels?

WITNESS BEDNARSKI: No. I would say these -- this project is a little bit once removed from that in that we relied entirely, I would say, on external references as opposed to talking with the designers, the constructers, or the project owners.

That did not take place in this. This was primarily done by, again, research of technical papers that were given and conferences and other information that's generally available through the Internet.

MR. KEELING: Is there some reason you did not reference your source materials in your written testimony as other experts have done?

WITNESS BEDNARSKI: There was no particular reason why not.

MR. KEELING: And about the legal regimes or rules governing the approval of this project -- and I'm referring still to the Gotthard Base Tunnel -- do you have any understanding as to what those rules were?

WITNESS BEDNARSKI: No, I do not.

MR. KEELING: Going on to page 9, line 4, the State Route 99, Alaskan Way replacement tunnel.

What were the sources of your information concerning the successful outcome and the lack of risk

or injury to project stakeholders?

WITNESS BEDNARSKI: Again, we met the project designers, the project managers, the contractors. We met with the project owner also on a couple of occasions related to this project.

MR. KEELING: Did you review any technical papers or reports about this project?

WITNESS BEDNARSKI: There's actually been very little written in the industry about this project yet due to the specific circumstances of it. There's not a lot out there. So most of it, the information that we have, has been from firsthand dialogue with the project participants.

I might add there's been information available on the Internet also that describes some of the issues and other, you know, successes of this project. So I would say, through those four or five different sources, that's what we've been able to glean our conclusions from.

MR. KEELING: Is there any reason why again you did not cite any source materials in your expert testimony?

WITNESS BEDNARSKI: No, no particular reason.

MR. KEELING: By the way, how long was this tunnel?

WITNESS BEDNARSKI: Can we go to Slide -- let's see. Slide 25. It's 1.9 miles. We've rounded it up to 2 miles.

MR. KEELING: Okay. I'd like to go back to page 2, lines 12 through 15.

In your survey -- and I'm using your term, "survey" -- your survey of large-diameter tunnel projects, how many projects did you identify in total? I'm not talking about what made it into your testimony but what was the larger pool of projects you identified?

WITNESS BEDNARSKI: Well, I think currently completed, there's this list of -- what are there, eight or nine projects on that list? And then if you go to Slide 6 --

MR. KEELING: We'll come to that in a minute, Mr. Bednarski.

WITNESS BEDNARSKI: Well, you asked me specifically for what list did we confer with, so I wanted to go to that discussion.

MR. KEELING: Let's go to Slide 6.

WITNESS BEDNARSKI: We've also -- some of the projects that are on our list that we've gone into detail now are also on this list here. So this kind of covers some of those, but this is specifically gauged at some of the larger diameter tunnel projects that would

be of similar or larger size to the ones that are proposed for the WaterFix.

Again, some of this information is a little difficult to get to, but we've been able to find it on the Internet. And if we have a consultant available to provide some information, we've used those as sources of projects that have been completed. Perhaps not with the same level of detail as the ones we enumerated in detail in my testimony.

MR. KEELING: Well, as I recall, Slide 6 lists 10 other tunnels besides the proposed California WaterFix tunnels. And two of those tunnels listed on Slide 6, specifically -- the Port of Miami and Seattle State Route 99 -- overlap with the list we saw in your written testimony; is that correct?

WITNESS BEDNARSKI: Yes, that's correct.

MR. KEELING: As to the other eight non-WaterFix tunnels on Slide 6, I notice that you cite to no source materials.

Do you have any source materials for your testimony about those tunnels?

WITNESS BEDNARSKI: Those source materials could be developed. I don't have them written down in a document form, but those could be quickly gathered by doing some Internet searches on these projects. Those

would be the basis.

The purpose for this slide was to convey the information that tunnel projects at the size of California WaterFix or larger are being done with regularity in different parts of the world.

MR. KEELING: Taking a look at Slide 6, did the -- did the Sparvo, Italy, tunnel that you list there have a successful outcome, as you use that phrase in your written testimony about the other tunnels?

WITNESS BEDNARSKI: I'm not characterizing all of these tunnel projects on here as having that same successful outcome. But I do know that they were completed, large tunnel bore projects.

But we did not go through all of these other projects here with the same rigor to determine whether they met all of the criteria that we identified for the other eight. We knew -- we do know that they have been completed and that they're in operation with the exception of Thimble Shoals project which has just been awarded for construction and designed as a design/build project. So that one is underway but not completed at this particular time.

MR. KEELING: So to make sure I understand what you're saying. Other than the Port of Miami project and the Seattle State Route 99 project, which

were also discussed in your written testimony, you are not making the claim, are you, that these other non-WaterFix tunnels had a "successful outcome" as you use that phrase in your written testimony, nor are you claiming that there was no risk or injury to project stakeholders as you use that phrase in your written testimony?

WITNESS BEDNARSKI: As far as successful outcome, it's my understanding -- again, with the exception of the Thimble Shoals project and, of course, the California WaterFix project -- that all of these projects have been completed or are very close to being completed, like the two Hong Kong projects, and will be used for their intended purpose.

On the rest of these, with the exclusion of the Port of Miami and the Seattle one, we have not gone to the depth of inquiry to determine the state of the stakeholders or talking to the design engineers, the contractors, or the construction managers or necessarily the owners about these projects.

But I might mention with the Hong Kong tunnels -- there's two of them listed -- I did make a personal trip to Hong Kong in January, met with the owner, the construction contractor, and the designer. Took that trip on my own vacation time. And for the

best of my observation from discussing the project with them, these are moving along successfully also.

MR. KEELING: Is it fair to say to conclude that with respect to the other projects, eight other projects you haven't testified to in connection with your written testimony, you also are not aware of the rules or legal regime governing approval of construction of the project?

WITNESS BEDNARSKI: No, I am not.

MR. KEELING: Thank you. That is all I have. Thank you very much.

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

Ms. Meserve?

As Ms. Meserve is coming up, let me check to make sure Mr. Keeling was joined by Mr. Jackson and Ms. Meserve. Is there anyone else who wishes to join on that objection?

MS. DES JARDINS: Yeah. Deirdre Des Jardins, California Water Research also joins.

CO-HEARING OFFICER DODUC: Thank you.

Ms. Meserve.

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CROSS-EXAMINATION

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MS. MESERVE: Good afternoon. I have questions for Mr. Bednarski and also for Ms. Buchholz.

CO-HEARING OFFICER DODUC: Closer to the mic.

MS. MESERVE: In terms of the covered areas to cover with Ms. Buchholz, I wanted to talk about what is the groundwater injury of the modeling, about the mitigation of groundwater, and also about the availability of well data, subsurface data.

With respect to Mr. Bednarski, I want to touch on -- although Mr. Keeling covered quite well the large-diameter surveying -- definition of injury, permanent and temporary injuries to water diversions, mitigation for those injuries, and also engineering status of the project.

CO-HEARING OFFICER DODUC: Please proceed.

MS. MESERVE: I will continue with Mr. Bednarski because you're all warmed up here.

Okay. Just touching on the large -- just to close out the large boring project, I wasn't quite sure I heard, and I apologize if you said it and I missed it.

But what would you say the -- on page 2 of your testimony, when you discuss these projects that you looked at and you summarized in your testimony, you say they were successfully completed without risk or injury.

Can you just explain what "risk or injury"

means in your context?

WITNESS BEDNARSKI: Again, I think I've tried to define that in the previous testimony.

Our conversations were limited specifically with design engineers, construction managers, contractors, and, in some cases, the owners. And so "risk or injury" would have to do with us being made aware of any issues with the tunnel design itself that became apparent during construction, any surface impacts that might have been caused by the tunneling operations, or any impacts to buried infrastructure that the tunnel would have come in close proximity to when they were mining the tunnels.

MS. MESERVE: And when you mentioned risk, would that have to do with -- or injury -- would that have anything to do with something like worker injuries?

WITNESS BEDNARSKI: We didn't ask specific questions about the safety records for the projects. That was not something that we would typically bring up.

MS. MESERVE: And you mentioned in your testimony, both on page 2 and on page 23, that you -- that you believe that the alleged injuries will not occur with this project. What type of injury are you mentioning there in your testimony?

WITNESS BEDNARSKI: I -- well, we're

responding specifically to the testimony of by East Bay MUD and Mr. Cosio that are listed in my testimony and responding to those specific concerns that were raised at that time.

MS. MESERVE: And are you aware that in this portion of the water rights proceeding we are specifically looking at the question of whether there will be injury to legal water users?

WITNESS BEDNARSKI: Yes, I'm aware of that.

MS. MESERVE: Are you intending to testify as to whether those -- an injury to legal water users would occur?

WITNESS BEDNARSKI: I believe that I testified in my Part I testimony about the intake structures and how we would be constructing slurry walls to protect our site from surrounding subsurface water levels. And also have testified about the construction methodologies that would be used for some of the features in the rest of the WaterFix, including Intermediate Forebay and the slurry wall construction there and the tunnels and use of the segmented liner with gasket and backfill grouting that would -- that would cause us to believe that there would be little or no leakage out of the tunnel or leakage into the tunnel.

So, yes, I've testified to that.

MS. MESERVE: So is it fair to say that your testimony does speak to the legal issue of injury to legal water users?

WITNESS BEDNARSKI: In those specific areas that I just mentioned, yes.

MS. MESERVE: But would it be also fair to say that with respect to the nine projects you looked at as examples, that that evidence did not look at the issue of legal injury to water users?

MR. BERLINER: Objection. Asked and answered.

CO-HEARING OFFICER DODUC: Actually, she's trying to clarify a point that I think is needed.

So please answer, Mr. Bednarski.

WITNESS BEDNARSKI: Could you rephrase the question? I'm not sure that I follow the question.

MS. MESERVE: I think part of the confusion stems from the use of the word "injury."

Now, we've clarified in your testimony just now, with Mr. Keeling in particular, that when you looked at the nine example projects, you were not looking at legal issues with respect to things like injury to water rights or water uses.

So my question is just to ask you to confirm that with respect to that portion of the testimony, you're not presenting that as evidence that there

wouldn't be injury to legal users of water here in this project?

WITNESS BEDNARSKI: I don't believe that the reason we listed these projects was to address the risk to legal users of water. It was more to address issues that were raised as to feasibility of these tunnels being constructed due to their large size and the length of the tunnel drives and their potential impact to existing infrastructure in the delta, whether that was levees or the piers that supported after that -- crossing the levee. And also -- yeah. So that was -- that was the purpose of the survey.

And then additional testimony has been provided in the forms of the ARUP leakage study to indicate the levels of either leakage or -- leakage from the tunnels or leakage into the tunnels. And that the conclusion that we've reached is that there would not be an impact to legal users of water from the -- construction of the tunnels.

CO-HEARING OFFICER DODUC: You are doing so well.

MS. MESERVE: Sticking with page 23, last line says "or otherwise significantly adversely affect other users of water."

Can you explain to me for your purposes what

you think the relevance of the term "significantly adversely affect" is in this proceeding?

WITNESS BEDNARSKI: Where's that line again?

MS. MESERVE: Page 26, line 23.

WITNESS BEDNARSKI: I think that's limited to the construction of the California WaterFix facilities and with this testimony specifically in the tunnel area either by the tunnel construction impeding flows of water to wells or us intercepting wells with the tunnels or changing groundwater regimes because of the construction or operation of the tunnels.

And that was the basis for doing our leakage report to examine that and provide that as evidence.

MS. MESERVE: And with respect to groundwater, which I will ask Ms. Buchholz about in a bit, but did you assist in preparing her testimony? I didn't see testimony about groundwater, and that's why I'm asking.

WITNESS BEDNARSKI: No, I did not. My testimony would be limited, as far as groundwater, strictly to our estimates of leakage going into and tunnel or leaking coming out of the tunnel. That would be the narrow focus of my effort in that area.

MS. MESERVE: Thank you.

Moving back to page 22. You discussed the injury permanent to Mr. van Loben Sels' diversion, which

is S021406 and is shown on DWR-2, Slide 21, as well.

And in this part of your testimony, you state that there will be no permanent effects because the fish screens don't extend to where the diversion is located.

Can you explain how far from the diversion the fish screens are?

WITNESS PIRABAROOBAN: Yes. If you could bring DWR-660, please.

If you looked at the legend, the solid black box, it says "Intake Structure" and that shows intake footprint. For example, at Intake 2, the northernmost intake, you would see the black box there. That's the area of the fish screen as well as the concrete intake structure, the footprint for the fish screen structure.

MS. MESERVE: Now, with respect to the temporary impact, Mr. Bednarski's testimony on page 22 states that a replacement water supply could be provided. And I would like to know would it be provided through the same intake or from a different location during construction.

WITNESS PIRABAROOBAN: If you could open DWR-6 and go to Slide No. --

MS. McCUE: This is DWR-6 errata.

WITNESS PIRABAROOBAN: Slide No. 39, please.

So the -- the first bullet under mitigations

for temporarily affected diversions, first, prior to construction, extend pipes and adjust pump locations on land side.

So there's a possibility that we would keep this intake on the water side. We don't need to move that because the temporarily affected ones are within State Route 160 footprint.

MS. MESERVE: And are you aware -- I guess either of you -- about in the written testimony of Mr. van Loben Sels, which was Land 30, he discusses that the water system that feeds water to that district is fed by gravity or distributed by gravity.

So how is the replacement water supply able to be distributed in the same manner?

WITNESS PIRABAROOBAN: So this is one of the mitigation options we have. If -- if you can implement this, this is what we will do. But if site conditions indicate this cannot be done, then we have two other options there.

MS. MESERVE: From a different source?

WITNESS PIRABAROOBAN: Yeah, from new groundwater wells or provide supply from different source.

MS. MESERVE: Would that include creating a new water distribution system for that entire district?

WITNESS PIRABAROOBAN: That has to be looked at on a case-by-case basis. And -- but if you recall what's provided in Mr. Bednarski's Part I hearing, that DWR is making the commitment to provide the water supply during construction. And that's for both temporarily and permanently impacted. And once the Highway 160 construction is completed -- and we expect that would last only for like 12 to 18 months -- then the temporarily affected one would be restored to the original condition.

MS. MESERVE: Please look at Land 60 just for a moment to clarify this. The -- are you aware, however, that the diversion may serve more than one farm, and so it's not just a matter of providing water to a single farm but an entire set of farms that is shown underneath the green lines which is the distribution system here in Land 60?

WITNESS PIRABAROOBAN: I haven't personally talked to the owners, but I visit the sites and look at the existing diversions. That's something we would be doing as part of next phase engineering.

MS. MESERVE: Thank you. Let's see.

Do you know when petitioners will make a final determination on how these alternate water supplies will be provided?

WITNESS PIRABAROOBAN: We have come up with the options. And also we are making the commitment and determining the -- which method we would use that involves working with the landowners or the farmers. And I think that will happen before construction begins.

MS. MESERVE: So would you note in a matter of so many years prior to any construction or what would you put the timeline?

WITNESS PIRABAROOBAN: I would say at least months in advance.

MS. MESERVE: Let's see. Have petitioners performed any technical analyses that demonstrate that these water replacement measures are feasible and could be implemented successfully for this diversion or any others?

WITNESS PIRABAROOBAN: The methods we have proposed typically done -- and we haven't selected a particular method because we haven't done the level of design that, you know, has to be done to make that determination. But we're hoping to do that as soon as we move into the preliminary and final engineering.

MS. MESERVE: Within the engineering team, did you ever discuss the option of performing more site-specific inquiries about these kinds of water diversion issues earlier on in the process rather than

deferring it out?

WITNESS PIRABAROOBAN: No. First of all, we haven't -- we -- last December we released the final EIR/EIS. When it is certified, we will have the project and then we will move into the next phase of the engineering. And I think at that point, you know, we will start, you know, the kind of analysis that you are referring to.

MS. MESERVE: With respect to the final EIR, is there a reason why that's not been submitted as evidence in this proceeding?

WITNESS PIRABAROOBAN: I think it's included as one of the board's exhibits, 102. SWR CB 102.

MS. MESERVE: SWR CB?

WITNESS PIRABAROOBAN: Sorry. 102.

MS. MESERVE: 1 or 2?

WITNESS PIRABAROOBAN: 102.

MS. MESERVE: The final EIR?

WITNESS PIRABAROOBAN: Uh-huh.

MS. MESERVE: With respect to -- back to Mr. Bednarski. Your testimony refers to conceptual engineering design and a conceptual design report on pages 1, 3, 12, 23, and 24.

Are you referring to the 2015 CER?

WITNESS BEDNARSKI: Yes, I am.

MS. MESERVE: And what is the status of completion of a more recent CER -- or more up-to-date CER, I should say, for this project?

WITNESS BEDNARSKI: The one dated July 1st, 2015, is the most recent report. And there have been no revisions made to that since that time.

MS. MESERVE: With respect to this panel and also on cross, that the engineering we heard that there were some changes to the project and to mitigation measures, when would it be appropriate to reflect that in an updated CER?

MR. MIZELL: Objection. Speculative and outside the scope of rebuttal.

CO-HEARING OFFICER DODUC: Ms. Meserve? Highlight that testimony for me.

MS. MESERVE: I'm trying to clarify what he's relying on, Chair Doduc, because all I know is what's available to the public. Apparently he's relying on --

CO-HEARING OFFICER DODUC: I think he's answered what he's relied on.

MS. MESERVE: Thank you.

Now, Mr. Bednarski, you've put forth evidence about the nine comparison tunnels. Looking at those, do you believe that -- is it your opinion that this project is feasible?

WITNESS BEDNARSKI: Yes, it is.

MS. MESERVE: And how soon do you think the project could begin construction?

MR. MIZELL: Objection. Speculative and outside the scope of rebuttal.

CO-HEARING OFFICER DODUC: Ms. Meserve?

MS. MESERVE: I'll let it go. Thank you.

Have there been any delays in this -- in this project -- strike that.

In your testimony, Mr. Bednarski, you discussed a thorough planning and design philosophy. Has that led to delays in this project?

WITNESS BEDNARSKI: I don't believe so. Depends on which -- which specific reference to planning and -- thorough planning and design are you referring to so I can take a look at that? Is there a specific citation so I could put it in the right context?

MS. MESERVE: Yes. I believe I saw it on -- I can't find it right now. It's not important. Thank you.

Okay. On page 10, line 6, Mr. Bednarski, you discuss in line 4 that good geotechnical information is key and there is no way for an owner to get out of responsibility for on-the-ground conditions. Oh -- and this is the thorough investigation.

When do you expect to conduct the geotechnical investigations that are referenced here?

WITNESS BEDNARSKI: We would have to have certification of all the environmental process and authorization of the project within DWR to commence on some of that work which I -- I can't really speculate on when any of that would happen.

MS. MESERVE: And what do you mean by CWFT has learned there is no way for an owner to get out of responsibility for ground conditions? What does that refer to?

WITNESS BEDNARSKI: In all of the projects that we've talked to people about, the mantra is the owner always owns the ground and, therefore, it's the owner's responsibility to do a thorough geotechnical investigation and not rely as other parties, such as the contractor, to do that work. And we submitted that just as evidence that we will have to do a thorough ground investigation and analysis before any designs are completed and before the project is turned over to a contractor to build.

MS. MESERVE: And could we look at Land 84, which is in the Bednarski folder, please? If you could scroll down to a little bit to authenticate this.

Now, Mr. Bednarski, do you recognize this

e-mail between you and Chuck Gardner from 2015?

WITNESS BEDNARSKI: Generally, I do.

MS. MESERVE: Could you scroll to the next page, please?

Now, just following up on this issue of what could be farmed out to contractors, what does the "DWR turnkey approach" referenced here mean?

MR. MIZELL: Objection. Outside the scope of rebuttal.

CO-HEARING OFFICER DODUC: Ms. Meserve, link it for me, please. Spell it out.

MS. MESERVE: I think where I got this idea was on page 10 where he's discussing good geotech information and there's no way for an owner to get out of it. And then I happen to have these documents that talk about this turnkey approach that appears to me to be a different approach where DWR would be distanced.

And so I'm trying to inquire as to if perhaps Mr. Bednarski has changed his opinion since 2015 or, you know, what's going on with this line of planning.

CO-HEARING OFFICER DODUC: Please proceed.

WITNESS BEDNARSKI: That train of discussion that we were on prior to moving to this exhibit, that doesn't really apply to this statement that I made in this e-mail when I was referring to a turnkey approach.

I was aware at that time that DWR had access to geotechnical investigation firms that they could use under their existing contract authority to do the exploration work needed. And then those -- that information could then be utilized by DWR geotechnical engineers, and any of the other design engineers that DWR would have, to do a complete turnkey package for a design effort.

And I believe at the time, this e-mail was discussing a potential groundbreaking project which was subsequently halted after additional information was found. So that effort was never culminated.

MS. MESERVE: Could you pull up Land 83, please?

Do you recognize this e-mail, Mr. Bednarski, regarding the permit schedule?

WITNESS BEDNARSKI: Generally, yes.

MS. MESERVE: What does it say about a groundbreaking ceremony?

WITNESS BEDNARSKI: I think this goes back to the comment that I just made that at one point in the DCE and in my work with DWR, there was some thought of doing a groundbreaking project in 2016. That effort was eventually stopped when, again, some initial information was found out as to whether we could or could not do it.

And the determination was made that we couldn't, so we just ceased those efforts.

MS. MESERVE: Could you pull up Land 86, please?

And are you aware of Water Code Section 85088 --

MR. MIZELL: Objection. This is well beyond his rebuttal testimony at this point.

CO-HEARING OFFICER DODUC: Ms. Meserve, are you still on same line of questioning or is this a different line?

MS. MESERVE: I am still on the same line of questioning, yes. This relates to the --

CO-HEARING OFFICER DODUC: This is referring back to the statement about the owner and the responsibility of the owner?

MS. MESERVE: The owner responsibility and then the fact they were considering breaking ground.

And then now I'm looking at a water code provision that pertains to that, and I will wrap up.

MR. MIZELL: Mr. Bednarski's rebuttal in no way references a groundbreaking. Therefore, this is well beyond the scope of rebuttal.

CO-HEARING OFFICER DODUC: I believe -- Mr. Bednarski, I believe in answering Ms. Meserve's

first question regarding the first e-mail she put up, you made a statement that that there was not any connection between the groundbreaking ceremony that was planned and terminated to your comment regarding the owner and the owner's responsibility that's in your rebuttal testimony.

Could you expand upon that? Why is there not that connection?

WITNESS BEDNARSKI: Just because I thought that her prior questioning was along the lines of getting geotechnical information for tunneling.

This geotechnical information that was referenced in that e-mail that I had written in 2015 had to do with some site preparation work, and that it is still the owner's responsibility to get the geotechnical information so that we can do a competent design. And we can't rely on the contractors to either get that information later or to rely on others to get that information, that it would still be the owner's responsibility.

And hence the e-mail's suggesting that DWR use their own geotechnical consultant to get that information.

CO-HEARING OFFICER DODUC: Ms. Meserve, I suggest you move on to your next line of questioning.

MS. MESERVE: Okay. Well, I mean, wouldn't the geotechnical information be needed prior to the groundbreaking? Is that what you're saying?

WITNESS BEDNARSKI: Absolutely it would be. So we would go ahead and do that. We categorize geotechnical information gathering as part of the design process and not part of the construction process. So we would proceed with that ahead of having authorizations to start the construction work. That would go on separate timelines and require separate approvals. That's -- that's our understanding.

MS. MESERVE: And are you aware that under 85088 --

MR. MIZELL: Objection. It's well beyond the scope of rebuttal. He doesn't talk about groundbreaking. The fact that he uses the term "groundbreaking" in answer to a question about something that is in the scope of rebuttal does not then make groundbreaking within the scope of his rebuttal.

CO-HEARING OFFICER DODUC: I will agree. Sustained.

Move on, Ms. Meserve.

MS. MESERVE: Yes. Page 12, line 25, of DWR-75 discusses that there was no affect on levees from the Freeport and Sankey projects. Am I saying that

right, Mr. Bednarski? Sankey?

WITNESS BEDNARSKI: I'm not sure.

MS. MESERVE: This is stating that due to -- scrolling down the page a little bit -- that there weren't any damaged levees in these diversion projects so there would not be damage here in this project; is that correct?

WITNESS PIRABAROOBAN: Well, we are expecting to use similar construction methods, so the geotechnical conditions are similar. So that's the solution.

MS. MESERVE: Can you tell me what the scale of the Sankey and the Freeport projects are as compared to the CWF project?

WITNESS PIRABAROOBAN: Sure. Can we go to DWR-6. Slide No. 30, page 30.

As listed in that slide for Freeport, they had to drive approximately 520 sheet and H-Piles to construct the cofferdam and also to support the pump station.

And I believe length of this Freeport intake is about 300 feet. And the -- the length of our proposed intakes vary from approximately -- I'm talking about total -- 1500 to 2,000 feet. That depends on the site location.

MS. MESERVE: Is it fair to say that the CWF

intakes are at least five times as large as Freeport?

WITNESS PIRABAROOBAN: Lengthwise, yes.

MS. MESERVE: So would you think that the scale difference in the project might undermine the relevance of the experience for Freeport in particular?

WITNESS PIRABAROOBAN: No. If you look at -- the 520 piles were spread along, you know, 300 feet long structure versus the number of piles we have spread along the 1500 to 2,000 feet long structures. The impact would be about the same. Considering the geology conditions are the same, you know, I don't expect the impacts would be different.

MS. MESERVE: Even though it's a lot more piles, right?

WITNESS PIRABAROOBAN: But I'm talking about the intensity.

MS. MESERVE: But it would go on for a lot longer in order to install all the piles in the CWF instance.

(Reporter request for clarification.)

WITNESS PIRABAROOBAN: I said if she's talking about the time duration, that is correct. We have more number of piles.

MS. MESERVE: Would the more duration of pounding of piles lead to a higher probability that

there could be a problem of the levee, then, in the Freeport instance?

WITNESS PIRABAROOBAN: But you are driving more piles at different locations, not at the same location. If you are pounding same pile for longer duration at the same duration, yeah, what you're saying is correct. But here we are talking about different number of piles spread over different length.

MS. MESERVE: Okay. Thank you.

Moving on to groundwater questions, Ms. Buchholz. Let's see. Looking at -- I was looking at your calls under DWR-32, and would you say you're an expert on CEQA requirements or environmental review?

WITNESS BUCHHOLZ: I have worked extensively on CEQA environmental review, yes.

MS. MESERVE: And in your testimony, do you ever use the word "injury" in the context I was discussing with Mr. Bednarski as it relates to injury to water users?

WITNESS BUCHHOLZ: I don't remember if I actually used the word "injury" within the pages of my written testimony offhand.

MS. MESERVE: I will represent for the record that you don't.

And since you work a lot with CEQA and

environmental review, you were the assistant project manager for the environmental documentation for this project. What are the mitigation requirements under CEQA generally?

WITNESS BUCHHOLZ: For this project, final EIR/EIS has the recirculated EIR/EIS and also the draft EIR/EIS. In groundwater mitigation GW-1, we are stating that during the design phase, there will be extensive survey -- field surveys of the locations of groundwater wells, establishment of a monitoring program, monitoring wells and monitoring program, and also with the geotechnical information that is collected along the locations of the -- near the locations of the construction facilities. We'll be combining that information to develop a better understanding of groundwater conditions in the vicinity of the construction of the facilities.

During that process part of the groundwater for the under GW mitigation, GW-1, we will be also preparing the monitoring reports which will be provided to the public. We'll also look at the depth of the existing wells and look at, in some cases, the actual capabilities of those wells and drawdown curves associated with those wells in a certain vicinity.

MS. MESERVE: Excuse me. I think we're going

to get into some of the details of that in just a minute, but I just want to stick with this, if you don't mind.

WITNESS BUCHHOLZ: Okay.

MS. MESERVE: Going back to the terminology used in your testimony on page 10, you state that there would be a minimal effect. And on page 12, also minimal effect. And then on page 21, state there would not be a substantial effect.

And I would like to know how do those statements relate to the injury standard that is applicable here in this proceeding?

WITNESS BUCHHOLZ: So what we looked at here on -- using information that I used to develop the testimony was the results from the EIR/EIS process, as well as my own analysis of looking at how the groundwater recharge would and has been occurring from the adjacent surface water bodies towards the groundwater wells in these areas. We looked at both the soils and considered their permeability and transmissivity based upon the available information, acknowledging that we need to have additional information collected during the design phase.

MS. MESERVE: Thank you.

When you use the word -- I guess separate

question. How would you define "injury" as we're using it in this context to water users as a result of this project?

WITNESS BUCHHOLZ: As we described in the EIR/EIS, we're going to be considering the pumping capacities of the existing wells and the changes in groundwater elevations so that those users of the water whether they're agricultural or community wells, would continue to be able to provide the services that they currently provide without the project.

MS. MESERVE: With respect to the testimony you've provided, is it fair to say that you are equating the term "minimal effect" with no injury?

WITNESS BUCHHOLZ: We are saying that the minimal effect that we could mitigate -- that we put this testimony with the mitigation and the EIR/EIS, that we could mitigate those effects, in fact, we do think minimal in CEQA term would be less than significant.

MS. MESERVE: To your knowledge, is the CEQA standard for mitigation the same as the no-injury standard applicable in water rights proceedings?

WITNESS BUCHHOLZ: My understanding is that they're not specifically identical. However, the mitigation measures that come with the CEQA process and are part of the project description, we believe would

result in making -- because those mitigation measures specifically talk about making sure that we do not adversely affect the groundwater users, that that would be considered at least somewhat. Legally, I'm not the legal expert on those words.

MS. MESERVE: Understood. With respect to -- the final EIR discusses the permanent lowering of groundwater by 5 feet in the vicinity of the river under project operations. Do you think that would be an injury?

WITNESS BUCHHOLZ: The final EIR/EIS and the recirculated draft EIR/EIS acknowledge that during some periods of time, the groundwater adjacent to the Sacramento River is reduced as compared to the no-action alternative by up to 5 feet. But it's not a permanent; it's sporadic over time depending on how the intakes are used and also the flow of the river.

MS. MESERVE: But it would be in the project operation phase, correct?

WITNESS BUCHHOLZ: It would be in the project operation phase, but it's not consistently 5 feet reduction.

MS. MESERVE: And so we talked a little bit about earlier you had some questions about modeling and this was the output of the modeling.

WITNESS BUCHHOLZ: Yeah.

MS. MESERVE: And you testified that the model results are not predictive but only for comparative, correct?

WITNESS BUCHHOLZ: That's true.

MS. MESERVE: Now, in this modeling exercise, what's the significance of the no-action alternative?

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

MS. MESERVE: Was the no-action alternative is what things would be in the future without the project according to the model; is that correct?

WITNESS BUCHHOLZ: Yes, that's the definition of the no-action alternative.

MS. MESERVE: And what if the assumptions in the no-action alternative with respect to groundwater, for instance, were not accurate and didn't come to bear how useful with the NAAB in that instance?

WITNESS BUCHHOLZ: Again, as the assumptions for the adjacent groundwater, the ground soils in terms of transmissivity, basic depth to groundwater elevations would start off the same in both the no-action alternative and the action alternative model run.

The only thing that changes in those model runs is the flows in the Sacramento River.

So if it -- again, in the comparative mode, for instance, if the no-action alternative assumed a groundwater elevation was in reality either higher or lower, we would still see -- we would have that same assumption starting off in both the action alternative model and the no-action alternative. And, therefore, the incremental change we would anticipate to be similar.

MS. MESERVE: And again sticking with comparative, what the model shows is that at times the water level in the groundwater would be 5 feet lower?

WITNESS BUCHHOLZ: Up to 5 feet. Many times it was zero to 5 feet.

MS. MESERVE: Let's see. Going back to your testimony which is DWR-80, page 8, the testimony states that Joseph Tootle, the expert for land, stated that the tunnel and the forebay would reduce groundwater recharge and that it's contradicted by evidence that the groundwater would continue to be recharged.

Can you just briefly outline what you mean by the evidence that the groundwater would continue to be recharged?

WITNESS BUCHHOLZ: We basically looked at reports that were prepared by the -- both the counties, Sacramento County and San Joaquin County areas -- in

this area, it was Sacramento County -- and also looking at soil types either based upon soil borings that we had available for the project or based upon information from other soils reports in the area and soils assumptions that were included in the U.S. Geological Survey CVHM model.

MS. MESERVE: Is it fair to characterize that your testimony doesn't say that groundwater recharged won't be reduced; it just says that the recharge would continue?

WITNESS BUCHHOLZ: That's correct. We don't know until we do -- in the design phase, that's when we will do the field work to know if there are any changes in rates.

MS. MESERVE: On page 9 of your testimony, you described the soils that exist between Intake 5 and Intermediate Forebay. You break that down into two sections. Can you tell me what the approximate distance of these segments?

WITNESS BUCHHOLZ: The distances of the segments in the length of the tunnel shaft from Intake 5 to Linbrook Road, I don't have that. I'd have to look at the CTR Volume II on that. I don't have that in front of me.

MS. MESERVE: In general, however, your

testimony divides this characterization into three sections; is that fair?

WITNESS BUCHHOLZ: That's true.

MS. MESERVE: And if the tunnels are 35 miles long, might they be roughly a third?

WITNESS BUCHHOLZ: I don't want to say that. I can't remember. I wasn't paying attention to that when I wrote this.

MS. MESERVE: Okay. Is it fair to say it's several miles in each segment that you're characterizing?

WITNESS BUCHHOLZ: There would be several miles in them -- I'm trying to think. "Several" is a big number. There are at least probably more than 1 mile in each segment, yes.

CO-HEARING OFFICER DODUC: Ms. Meserve, I need to give the court reporter a break, so I would ask you to find a natural break in your cross-examination within the next five minutes or so.

MS. MESERVE: Okay. Yeah.

CO-HEARING OFFICER DODUC: Thank you.

Unless you think you can be done in five minutes.

MS. MESERVE: Probably not. I'm sorry.

CO-HEARING OFFICER DODUC: Okay.

MS. MESERVE: Let's see. So the first section on page 9 is characterized as silty, poorly graded, and sandy silts.

How did you determine that this was the soil type in this segment?

WITNESS BUCHHOLZ: As described in the testimony, we had soil borings that DWR had selected over the periods of time for this area.

MS. MESERVE: Do you know how many samples?

WITNESS BUCHHOLZ: I don't remember them offhand. I referenced the document there.

MS. MESERVE: And do you know, could there be soil variability within this area that would be accounted in those limited samples?

WITNESS BUCHHOLZ: The samples themselves showed that there was soil variability as you move along the tunnel alignment. But this was the general -- a general consistent elevations of these types of soils that occur.

MS. MESERVE: And if there were locations that had a denser soil type than the ones characterized on page 9, could that interfere with groundwater recharge in the area?

WITNESS BUCHHOLZ: That would be something that would be site-specific and the reason why we say

that during design we have to do the field work before we can confirm what we need to do to mitigate any potential adverse impacts.

MS. MESERVE: I will break there, if that's all right.

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

Let's take our break and we will resume at 3:00 o'clock.

(Off the record at 2:48 p.m. and back on the record at 3:00 p.m.)

CO-HEARING OFFICER DODUC: All right, everyone. It's 3:00 o'clock. We're resuming.

Ms. Meserve.

MS. MESERVE: Thank you.

CO-HEARING OFFICER DODUC: I expect you will be wrapping up your cross-examination.

MS. MESERVE: I shall be, yes.

CO-HEARING OFFICER DODUC: Thank you.

MS. MESERVE: I won't need much more time.

Let's see. So, Ms. Buchholz, going to page 6 of your testimony discusses the slurry walls. And it mentions that the slurry walls would interrupt groundwater from the Sacramento River at intake locations, but states that the groundwater would tend to

flow toward the east, including flowing around obstacles.

Have you considered that if the groundwater tends to flow east, some diversions may be injured by the interrupted flow of groundwater at these locations?

WITNESS BUCHHOLZ: As this -- DWR-80.

MS. MESERVE: Line 25.

WITNESS BUCHHOLZ: Go to page 14. This is DWR-80.

What we're seeing here, but on the right side of the graphic here, it's showing that the -- excuse me -- left side of the graphic.

CO-HEARING OFFICER DODUC: Ms. Buchholz, if you could stay close to the microphone.

WITNESS BUCHHOLZ: On the right side of the graphic, there are equal lines of groundwater elevation. So that, with the river in this area, we believe that the groundwater would be moving within those equal lines of groundwater elevation around any solid bodies of the slurry wall. Sorry that I'm shaking. And -- but those are equal lines of elevation, so we don't think that -- we do think that the groundwater would move around the intakes which represent less than 24 percent of the over 3 miles of riverbank in that area.

MS. MESERVE: Is it possible, Ms. Buchholz,

that Sacramento River water could be the only source of recharge for certain wells in this area?

WITNESS BUCHHOLZ: Not looking at that report and other reports that came out -- there's more than just these two that I reviewed. And in equal lines of groundwater elevation, I believe that all of that area is certainly connected. What we need to look at during design is the actual transmissivity of the soils of any nearby wells that would be adjacent to those intakes or any other construction features.

MS. MESERVE: Now, on page 8, you state that thorough site investigations and desk studies would occur later basically, to summarize.

Is it fair to say that petitioners have not yet considered the location and depth of groundwater wells in the vicinity of construction?

WITNESS BUCHHOLZ: That's true. During preparation of the EIR/EIS, we looked at multiple reports that had information in them, including the Delta risk management strategy reports that were prepared by DWR approximately 10 years ago. We looked at Yolo County reports and Sacramento County reports, and we realized that we did not have equal level of information across the entire construction footprint from the intakes to Clifton Court Forebay.

And then when we realized that we also wouldn't get additional geotechnical information during the preparation of the EIR/EIS from other sources, we basically made an assumption of presence of those wells and the acknowledgement that we would have to do all of the site investigations during design.

MS. MESERVE: And are you familiar with the DWR database as well as completion reports?

WITNESS BUCHHOLZ: We are. And we understand a lot of that was used in the delta risk management strategy reports. And that information provides locations and depths of wells based upon the well logs that were completed during the construction of those wells.

The information we need in addition to those depths is the depths of what the pump is located at. We need to know the -- the actual operation capacity of the wells so we can determine drawdown curves. And we need to have geotechnical information in the area so we can understand transmissivity.

MS. MESERVE: In the course of preparation of the environmental review or preparing for this proceeding, did you ever discuss doing mapping of all the known wells in the vicinity at this stage rather than referring it out?

WITNESS BUCHHOLZ: As part of the early parts of the draft -- preparation of the draft EIR/EIS, we attempted to look for an equivalent level of information along the entire construction alignment. And when we felt that we had different levels of information in different places and we didn't have enough thorough information that we would need to improve the groundwater model database or any other knowledge, that's when we said we would have to have site-specific information, and we would have to do that during the design phase.

MS. MESERVE: Now, with respect to the mitigation measures would avoid groundwater effects, to use your words, how can you know that the mitigation will be effective if you don't know what the exact problems to be encountered are?

WITNESS BUCHHOLZ: In mitigation measure GW-1 combined with mitigation measure AG-1 and UT-6 in EIR/EIS, all of those go together to give us a suite of mitigation tools to provide the water supplies that are currently provided without the project.

MS. MESERVE: And just to be clear, for mitigation measure AG-1, what is the different mitigation -- I'm looking at the mitigation on-site portion of that which I believe -- I'm sorry, not in

here.

Is there anything new in AG-1 I should be aware of that does more on the impacted diversions or wells?

WITNESS BUCHHOLZ: I don't believe there was any changes in the final EIR/EIS versus the recirculated EIR/EIS. When I look at page 14-42, the final EIR/EIS, that's what I'm referring to and with respect to mitigation measure AG-1.

MS. MESERVE: Okay. So looking at -- let's see -- Land 81, please, which is the final EIR, it's discussing that there's no additional mitigation measure other than GW-1 for operations.

WITNESS BUCHHOLZ: Mitigation measure GW-1 established the monitoring program, monitoring wells in that process.

MS. MESERVE: Do you see that that mitigation measure, GW-1, says it's for construction dewatering?

WITNESS BUCHHOLZ: I do.

MS. MESERVE: Petitioners committed to extending mitigation measure GW-1 to operation of the project?

WITNESS BUCHHOLZ: The -- not within the final EIR/EIS. Not that I'm aware of.

MS. MESERVE: So what is the mitigation during

operation of the project should there be interference or injury to groundwater wells?

WITNESS BUCHHOLZ: For the operations mitigation for the wells, and we refer back to AG-1 because the actual utilities were described in AG-1 for agricultural area, and mitigation UT-6 for the community wells.

So that was in Chapter 14 and Chapters 20, respectively, in the final EIR/EIS.

MS. MESERVE: So is this incorrect, what we're looking at right now, where it refers to GW -- I'm sorry. Let's scroll down to the top of the next page.

It says: "Mitigation implementation of GW-1, no mitigation measures in addition are required."

You're discussing AG-1. I don't see where that's referenced.

WITNESS BUCHHOLZ: It's not referenced in this location. It's a total packaging in the final EIR/EIS.

And, I believe, in the beginning of another portion of Chapter 7, which I don't have the page at my fingertips here, we do refer that these other -- that we need to take the findings in Chapter 7 in conjunction with Chapters 14 and 20.

MS. MESERVE: So would revisions to Chapter 7 on groundwater be necessary before you were to certify

this particular document?

MR. MIZELL: Objection. Goes beyond the scope of rebuttal. We didn't discuss the validity or the extent of environmental document coverage for what we're talking about here.

CO-HEARING OFFICER DODUC: Ms. Meserve?

MS. MESERVE: The witness has testified that there's mitigation measures that AG-1 would be applicable. And I'm just looking at the document to see whether the document says that and it doesn't.

MR. MIZELL: The witness can certainly speak to mitigation measures contained in the document. But as to validity of the document and whether it's ready for certification, that's well beyond the scope of Ms. Buchholz.

CO-HEARING OFFICER DODUC: Ms. Buchholz, please limit your answer to that.

WITNESS BUCHHOLZ: Yes, ma'am.

MS. MESERVE: Okay. All right.

So in mitigation measure GW-1, which is reflected in Land 82 -- sorry.

CO-HEARING OFFICER DODUC: Ms. Meserve?

MS. MESERVE: I'm almost done.

CO-HEARING OFFICER DODUC: All right. Five minutes.

MS. MESERVE: Yes. Thank you.

CO-HEARING OFFICER DODUC: Thank you.

MS. MESERVE: The mitigation measure GW-1 states that petitioners will determine the location of the wells in the area of influence of the construction sites at which dewatering would occur.

How did petitioners determine what constitutes the anticipated area of influence?

WITNESS BUCHHOLZ: So, initially, based upon -- because this mitigation measure GW-1 is maintained even with the presence of the slurry walls included in construction.

We would still, as we talked about it in the EIR/EIS, the area of influence extends approximately a mile from the intakes in many major dewatering efforts.

MS. MESERVE: Is that supportive of the modeling efforts?

WITNESS BUCHHOLZ: Yes.

MS. MESERVE: What if there were wells outside of that defined zone?

WITNESS BUCHHOLZ: I'm not sure of that process to extend that area or actually specify the location that would be dependent.

I would say this about Appendix 3B. That would be dependent upon the information we find in the

geotechnical information.

MS. MESERVE: Is it possible that well owners outside that defined area of influence would have a hard time receiving the benefit of mitigation measure GW-1?

WITNESS BUCHHOLZ: I don't know that.

MS. MESERVE: And if they did not, then might there --

WITNESS BUCHHOLZ: I can't speak to that.

MS. MESERVE: All right. And in mitigation measure GW-1, it talks about in a manner that could adversely affect adjacent wells in terms of some kind of standard. What's the definition of that in terms of feet or otherwise defined in that?

WITNESS BUCHHOLZ: Again, we'll be doing the analysis based upon the soils and also of the depth of the pumps and the groundwater drawdown.

MS. MESERVE: Now looking at Land 83 briefly, this is an excerpt of the environmental commitment 3B2, 23, with the -- referring to the use of the slurry walls that we've been discussing.

And on page 75, it discusses geotechnical borings to develop the specific design parameters.

Are there multiple types of design parameters that petitioners could select from these slurry walls?

WITNESS BUCHHOLZ: Could you focus me on a

line item? The words sound familiar. Which line?

MS. MESERVE: Wherever it says "geotechnical," so 28.

WITNESS BUCHHOLZ: There it is. So, again, we'll be looking at the soils information that we'll receive from the geotechnical borings, the types of soils as you can see that would be including considerations for the types of transmissivity you see during the soil types to determine the recharge rates, dewatering rates, horizontal extent of the zone flushes. For the extent flow, we'll have to do an extensive, detailed groundwater analysis during the design construction.

MS. MESERVE: Would the selection of different design parameters at this stage, would that would -- that would have an effect on the effectiveness of mitigation?

WITNESS BUCHHOLZ: That would actually be used to determine the final mitigation measures.

MS. MESERVE: Now, also on this same page discusses the use of slurry walls to protect groundwater and states that simulation results suggest that two months after pumping ceases, water levels would recover to within 5 feet.

If the water levels do not recover to their

prepumping levels, would you think that would be an injury to a water right?

WITNESS BUCHHOLZ: That's what's described in the combination of all three mitigation measures of, as I said before, GW-1, UT-6, and AG-1.

MS. MESERVE: So that -- that would be the remedy for the operational impacts as to those mitigation measures?

WITNESS BUCHHOLZ: That provides a suite of mitigation measure approaches that could be used.

MS. MESERVE: And who would determine which mitigation measure approaches would be used?

WITNESS BUCHHOLZ: That, as we said in -- both in GW-1 and 3B, this information will be provided by DWR to the landowners. It will be -- I don't know exactly the mechanism of how that decision will be made. The information from the engineering standpoint would be used to develop the information you've referenced in lines 28 through 34 on page 3B75.

MS. MESERVE: So would DWR project proponents be determining whether there was an injury or whether they recovered to prepumping levels?

WITNESS BUCHHOLZ: Well, the results of the -- the nonmonitoring wells will be in place, and the monitoring results, as we've said in -- in GW-1, would

be provided to -- in reports, I believe. I don't want to say this incorrectly. But the reports are going to be provided on monthly -- the monitoring reports would be -- data would be reported on a monthly basis. So -- and it's annual summary report as part of mitigation measure GW-1. So this isn't -- this would be available for all parties to participate in.

MS. MESERVE: And wells have screening depth, correct?

WITNESS BUCHHOLZ: Yes.

CO-HEARING OFFICER DODUC: Please wrap up.

MS. MESERVE: One last question: If it was, say, less than a 5-foot drop but it goes below the screening depth of a well, might that require some other type of mitigation than what's been laid out here?

WITNESS BUCHHOLZ: That's why the information is needed from a field survey to determine pump depth, screen dump.

MS. MESERVE: And then DWR would determine the appropriate response?

WITNESS BUCHHOLZ: DWR will be responsible for implementing mitigation pressures prior to construction of the structure.

MS. MESERVE: Thank you.

CO-HEARING OFFICER DODUC: I thank you,

Ms. Meserve. I have Ms. Des Jardins as the final cross-examiner. Is there any other cross-examination?

All right. Ms. Des Jardins?

--o0o--

CROSS-EXAMINATION

MS. DES JARDINS: My questions are primarily for Mr. Bednarski and Ms. Buchholz. I wanted to ask you a question first.

CO-HEARING OFFICER DODUC: And the topics you will be exploring?

MS. DES JARDINS: The topics I will be exploring --

CO-HEARING OFFICER DODUC: I'm sorry. Use your microphone, please.

MS. DES JARDINS: With Gwen Buchholz are groundwater levels. With Mr. Bednarski are sea level rise flooding and then the leakage analysis. He refers to the Eurasia Tunnel. And I wanted to ask about some specific project requirements and one other or common with this one if he's familiar with them. Also with the Lee Tunnel which he refers to.

And then I wanted to ask about settlement monitoring, monitoring for settlement during tunnel boring, and provisions for that. And mitigation plans for discharges settlement control and noise vibration

and other things which are covered in the Eurasia Tunnel resettlement impact analysis. And it was a successful project.

CO-HEARING OFFICER DODUC: I will ask that you focus the scope of your cross-examination on this rebuttal testimony.

MS. DES JARDINS: Thank you.

Ms. Buchholz, am I saying your name correctly?

WITNESS BUCHHOLZ: Yes.

MS. DES JARDINS: This is respecting your testimony. I just have a general question. So it seemed that your testimony is primarily with respect to groundwater levels and not so much with respect to changes in groundwater quality.

WITNESS BUCHHOLZ: Rebuttal testimony is specifically to groundwater elevations, yes.

MS. DES JARDINS: Thank you. That's what I wanted to clear up, and that concludes my cross-examination of Ms. Buchholz.

And then I wanted to pull up Exhibit DDJ 170. I've highlighted some of Mr. Bednarski's testimony. And please go to page 3 I have highlighted there.

Mr. Bednarski, you say that projected sea level rise decreases moving further upstream such that 55-inch estimate at the Golden Gate Bridge translates to

18 inches at the intake locations; is that correct? So you're saying there's 18 inches of sea level rise?

WITNESS PIRABAROOBAN: Yeah. That's the estimate we are using for design.

MS. DES JARDINS: Okay. So let's go to page 23, line 11 to 13.

And this is what it's based on, that there was an analysis done in 2009 to establish the design flood water surface elevations for the facilities, and that's Exhibit DWR-661.

WITNESS PIRABAROOBAN: Yes.

MS. DES JARDINS: So let's go to Exhibit DDJ 171, which is Exhibit DWR-661 with highlighting. Go to page 1 and scroll down a little.

This technical memo was intended to provide initial tentative general flood protection information. Are you familiar with that limitation?

WITNESS PIRABAROOBAN: Could you repeat that? I can barely hear you.

MS. DES JARDINS: It says this TEM is intended to provide initial tentative general flood protection information and guidelines.

WITNESS PIRABAROOBAN: I can see that there, yes.

MS. DES JARDINS: So are you going to develop

more detailed -- detailed information that's not initial or tentative?

WITNESS PIRABAROOBAN: Yeah. We will review what's in this memo. And as part of our next engineering phase, if this criteria we have used needs to be refined, we will do that as part of the final design.

MS. DES JARDINS: Okay. Let me go to page 4, which covers tidal flooding.

So stop. So this is -- is this scenario tidal flooding due to sea level rise assuming a levee breach without a storm flood event. And you have -- for that scenario, they did an estimate of mean high water along each alignment; is that correct? So is this the appropriate estimate for sea level rise?

WITNESS PIRABAROOBAN: I think that's explained in -- if we go to the correct pages, pages 6 and 7.

MS. DES JARDINS: All right.

WITNESS PIRABAROOBAN: Specifically page 7. That's where the second paragraph starts to discuss the sea level rise that's considered in this analysis.

MS. DES JARDINS: Okay. So this goes into Manning's equation. So the estimates of the increases were done with the following assumptions. The flows in

the channels were unaffected by sea level rise, and it used Manning's equation. This was based on the delta risk management strategy, technical memo Phase 1; is that correct?

WITNESS PIRABAROOBAN: I think so, yes.

MS. DES JARDINS: Okay. Let's pull up another exhibit. DDJ 172 is the Delta risk management strategy technical memo. Scroll down, please, to the highlighted section. Stop.

And it says: "Using Manning's equation to approximate the stages due to rises in the ocean seems very simplistic given the many factors involved and the complexity of the hydrothermal conditions, the flows in the delta."

The response was: "The method is simple but provides a measure of how far sea level rise may extend inland during a storm event. Although simple, the method was considered adequate for the level of detail needed by the risk analysis report."

Are you aware of this limitation of Manning's equation?

WITNESS PIRABAROOBAN: Not familiar with this particular document you have open there.

But, you know, I understand according to the DWR-661 we have submitted that they used the Manning's

equation to project the sea level rise inland.

MS. DES JARDINS: Is it possible that the level of detail needed to design a $17 million project might be more detail than required for the delta risk management study?

WITNESS PIRABAROOBAN: Just wanted to mention that we are at the conceptual level; we are not at final design stage. So that's what I mentioned earlier. We would review the analysis and results and, if needed, we would refine these estimates as part of our final design.

MS. DES JARDINS: So I would like to go back DDJ 171, which is Exhibit DWR-661 with highlights. And then I would like to go down to page 32, which is with sea level rise of flooding. And I believe that the numbers written in black are mean high water currently. And the numbers written in blue are green high water with sea level rise.

Can we zoom out a little? But this appears to be -- tidal flooding water surface elevations.

And I looked at Freeport -- let's scroll back up to it. It doesn't show Hood, but Freeport it shows 6.6 feet currently and 11.1 feet with sea level rise.

And that's 4 1/2 feet, which is 54 inches.

Did you look at this chart?

MR. MIZELL: Objection. Lack of authentication as to who wrote the notes in this particular chart, map, whatever it is.

CO-HEARING OFFICER DODUC: Ms. Des Jardins?

MS. DES JARDINS: Let's go back up because I believe it's in the handwriting of the person who did the report. And it is the petitioner's exhibit. We can go back to -- would you like to go back to DWR-661 to confirm that page 32 is identical?

MR. MIZELL: I think that would give me peace of mind.

MS. DES JARDINS: Okay. Let's go up. Yeah, I was a little surprised. Let's go to original DWR-661. And scroll down to page 32. All of the -- all of the elevations are written in hand on these maps, and we see that it's --

MR. MIZELL: Thank you.

MS. DES JARDINS: We can scroll back up, but I believe -- let's go to the first page, and we can see the person who did.

CO-HEARING OFFICER DODUC: Why don't we go ahead and -- well, you actually are waiting for an answer to your question.

WITNESS PIRABAROOBAN: Well, if you have a chance to read this memo, you will see that they have

considered six different flooding conditions.

MS. DES JARDINS: Yes.

WITNESS PIRABAROOBAN: And for the intake locations, especially in the 2 and 3 river flooding condition, that's the one that would be applicable. And in this memo, if you go to Figure No. 3, you would see the correct elevations there.

The one you are showing is Figure 6, so you need to go three pages.

MS. DES JARDINS: I did want to confirm that there's more than 18 inches of sea level rise in this projection.

WITNESS PIRABAROOBAN: That depends on what flooding condition you are considering.

MS. DES JARDINS: All right. This is the change in water surface elevations with river flow?

WITNESS PIRABAROOBAN: That's correct.

MS. DES JARDINS: And we're seeing higher water surface elevations with river flooding, correct? Higher than the previous one just due to tide?

WITNESS PIRABAROOBAN: Yeah. These two are different. One is tidal and this is river flooding.

MS. DES JARDINS: These are the 200-year river flooding.

WITNESS PIRABAROOBAN: I think they have

numbers for both case, 100 and 200.

MS. DES JARDINS: Yeah.

WITNESS PIRABAROOBAN: With sea level and without sea level rise.

MS. DES JARDINS: So your -- so this assumption here, so are you looking at the differences with 200-year river flooding? And with river flooding, the contribution of river stage is significant.

WITNESS PIRABAROOBAN: Yeah, that is correct. If you were to read the -- what I was trying to say is that the sea level rise prediction would depend on primarily two factors, what's the river stage or what's the flooding event you are considering, whether it's 100-year, 200-year, as well as what location, whether it's Freeport or Clarksburg.

MS. DES JARDINS: Let's go back to DWR-375. Sounds like you might be changing your testimony slightly.

CO-HEARING OFFICER DODUC: What page?

MS. DES JARDINS: Page 3, line 16 to 18.

Yeah. Projected sea level rise such that the 55-inch estimate at Golden Gate Bridge translates to 18 inches at the intake locations.

So it sounds like you're modifying that slightly to say it's the difference in water surface

elevation with river flooding.

WITNESS PIRABAROOBAN: With 200-year river flooding.

MS. DES JARDINS: Yeah. And so let's go back to the other exhibit. Then let's go back and look at that.

CO-HEARING OFFICER DODUC: Which exhibit, Ms. Des Jardins?

MS. DES JARDINS: I'm sorry. Exhibit DDJ 171.

And let's go back to page 4. Okay. So you're looking at scenario -- was it island flooding, river flooding assuming no levee failures? Which scenario are you looking at?

Flooding by levee heights or island flooding limited by river stage, which of those scenarios?

WITNESS PIRABAROOBAN: It would vary by the site. First two sites, in Sites 2 and 3, that would be the first one, river flooding.

MS. DES JARDINS: Assuming no levee failures?

WITNESS PIRABAROOBAN: That's correct.

MS. DES JARDINS: If there's a difference of 4.5 feet in mean high water due to sea level rise, do you think there might be levee failures?

WITNESS PIRABAROOBAN: I'm not following your question.

MS. DES JARDINS: You said river flooding -- you're using river flooding assuming no levee failures to define for the design guidelines. But the question is: Under this high sea level rise scenario, is no levee failures a valid assumption?

WITNESS PIRABAROOBAN: You need to remember we are looking at 200-year flood elevation. So depending on the river stage, your sea level projection will vary.

The 4 1/2 feet you are talking about is at the Golden Gate Bridge. Inland, the level of sea level rise or the magnitude of the sea level rise will vary depending on the river stage. And for our design, we are considering a 200-year flood.

MS. DES JARDINS: I agree that the 200-year flood is accurate. I'm concerned that you're using Manning's equations, which has significant limitations, and that you're also not considering the possibility that island flooding might -- when you get to really high level of sea level rise, alter the geometry of the Delta channels.

WITNESS PIRABAROOBAN: For Intake 5, that's the case. That controls the flood elevations, Intake 5. That's the island flooding.

MS. DES JARDINS: But these aren't just design. Isn't 18 inches of sea level rise the design

for salinity intrusion, for modeling operations, for design of the shafts, for everything?

WITNESS PIRABAROOBAN: We are strictly talking about flood protection.

MS. DES JARDINS: Well, isn't it for the design of all structures, including the shafts, including the Clifton -- including the Intermediate flood bay including Clifton Court modifications?

WITNESS PIRABAROOBAN: I just want to make it clear we started talking about intake locations. Now you're talking about locations in the middle of the delta.

Yeah, for those that, you know, the other -- types of flooding conditions will be applicable.

MS. DES JARDINS: Okay. I would like to pull up DDJ 158, which is the final EIR/EIS, and page 32. This is --

CO-HEARING OFFICER DODUC: Hold on. Hold on, Ms. Des Jardins.

MS. DES JARDINS: I was trying to explain it a little bit. This is Chapter 9 on geology and seismicity.

Do you recognize this chapter from the final EIR/EIS?

WITNESS PIRABAROOBAN: I haven't reviewed it.

But, yeah, I recognize it.

MS. DES JARDINS: So let's go back to page 32, Section 9226. Document page 32. PDF page 32. Yeah, there we go.

So this one says this is the regulatory design codes and standards for project structures that you're going to use in the designs. Are you familiar with this?

WITNESS PIRABAROOBAN: Are you asking about -- about the text of this section?

MS. DES JARDINS: Are you familiar with the regulatory design codes and standards with project structures in the EIR -- final EIR/EIS?

WITNESS PIRABAROOBAN: Not all the design standards and comments listed here. We have several engineers work on this program with different expertise.

MS. DES JARDINS: Okay. Can we go to page 37? Because I'd just like to ask you about the guidelines for sea level rise. PDF page 37.

There we go. Scroll down to the bottom.

So it says -- up -- there we go. State of California -- so this is the guidelines you're going to use in the final EIR/EIS is the 2010 guidelines and the sea level rise projections range between 10 and 17 inches by 2050 and 18 and 29 inches by 2070.

Are these the designs? I can't -- I'm not clear.

WITNESS PIRABAROOBAN: Well, I think that testimony of Mr. Bednarski, DWR -- is it 75? We have cited the -- the document we have used and the numbers we used. What we have used is 55-inch sea level rise at Golden Gate Bridge by year 2100.

MS. DES JARDINS: But you said --

WITNESS PIRABAROOBAN: That's --

MS. DES JARDINS: You said that produced 18 inches of sea level rise and it didn't. It produced 4.5 feet.

WITNESS PIRABAROOBAN: No.

MR. MIZELL: Objection. No question pending. No question pending.

WITNESS PIRABAROOBAN: I did not say that.

MS. DES JARDINS: Can you read -- so there's a section there in the final EIR/EIS that says: "Underestimating sea level rise in the project design will result in harmful realized impacts such as flooding. Harmful impacts are more likely to occur if the project design is based upon a low projection of sea level rise and less likely higher estimates are used."

MR. MIZELL: I'm going to object to further questions about the content of this document. The

witness has already indicated he's familiar with the fact that it exists and it was drafted but not the content, and he's been relying upon the written testimony that was submitted at rebuttal.

CO-HEARING OFFICER DODUC: What is your specific question, Ms. Des Jardins?

MS. DES JARDINS: I was going to ask -- well, this seems to disclose that using a different -- a different range -- you know, the question is: Who -- what's the final determination about what is used? Because the final EIR/EIS is inconsistent with this testimony.

CO-HEARING OFFICER DODUC: Are you able to address the question?

WITNESS PIRABAROOBAN: Well, here at least, the paragraph I can just read, it's looking at projections by year 2050 and 2070. And those numbers are lower than what we used. In other words, we have --

CO-HEARING OFFICER DODUC: 2100.

WITNESS PIRABAROOBAN: Yes. We have taken a more conservative approach when it comes to designing the facility to provide the flood protection.

MS. DES JARDINS: I think that's about as far as I can get with this line of questioning, so thank you.

Can we pull up Exhibit DDJ 170, which is Mr. Bednarski's testimony with highlighting? And then I wanted to go to page 5, line 9, and this discusses the Eurasia Tunnel.

And so this is one of the projects that you're citing is a successful project?

CO-HEARING OFFICER DODUC: Ms. Des Jardins, were you here when Mr. Keeling did his exhaustive cross-examination regarding these tunnel examples?

MS. DES JARDINS: There's a document that I would like to ask.

CO-HEARING OFFICER DODUC: My question to you --

MS. DES JARDINS: Yes?

CO-HEARING OFFICER DODUC: -- and I guess my cautionary note to you is to not go over the ground that Mr. Keeling has really covered.

MS. DES JARDINS: Thank you.

Can we please pull up Exhibit DDJ 173, which is the project document from the Eurasia Tunnel project?

This is the environmental impact and social assessment for that project.

Are you familiar with the environmental commitments and design commitments for that project that made it successful?

WITNESS PIRABAROOBAN: I'm not familiar with that document that you have on the screen there.

MS. DES JARDINS: Well, I would like to ask you about the commitments which made it successful and see if you're making similar commitments for this project since you are citing it as an example.

And I'd like to go to page 70.

Page 70. Okay. And the lender had really specific requirements for seismic evaluation for the earthquake, that there would be a safety valuation earthquake that had a 2 percent chance within the next -- within 50 years. And the seismic design was also going to be reviewed by an independent technical advisor.

Are you doing a similar -- similar seismic analysis for a 2 percent in 50 years?

WITNESS BEDNARSKI: I don't know that we are specifically following that exact number. In DWR-212, we talk about some of the seismic criteria that will be used to develop the design criteria for the tunnels.

I don't know whether that's similar to this 2 percent in 50 years or not.

MS. DES JARDINS: Let's go to Exhibit DDJ 32, which is the relevant excerpt from the engineering report. DDJ 32. And this is the PGA. And it looks

like you're using 5 percent -- 500 years, which is 10 percent in 50 years, and 1,000 years, which is 5 percent in 50 years, but you're not using the one in 2500 year PGA which is much stronger.

And is there a reason that you're using these weaker seismic sources in the analysis?

WITNESS BEDNARSKI: Well, again, I think the geotechnical situation comparison between these two areas is quite different. That tunnel crossed an active fault zone, actually going through the fault. Our tunnels do not directly cross through them.

So without really studying this, I would not be able to make a reasonable comparison as to why they chose their criteria and ours was selected for our projects.

MS. DES JARDINS: Let's go to page 48.

This other thing I noticed is -- this is for the ground motions for the Clifton Court Forebay design. You're not using Southern Midland Fault which is 5 miles from the project site in the seismic analysis.

WITNESS PIRABAROOBAN: I'd have to go back and talk to the engineers who did this analysis. But my understanding would be that, though, there's a fault, it may not have been active. That could be the reason it was not included in the analysis.

MS. DES JARDINS: I think you should look closely at that because my recollection is that the Southern Midland Fault is the one that you think is most active and likely to cause a large earthquake directly in the delta and would be the one associated with 20 island failures.

So I think being familiar with the seismic sources in the delta is a good idea. And to see that the closest -- I mean, is there a reason to not analyze the three faults -- three of the faults that are closest to Clifton Court?

WITNESS PIRABAROOBAN: We are happy to talk to engineers who did that work and, you know, find out as far as why these were not analyzed. But this is not something included in our rebuttal testimony, and we didn't provide the answers to answer the questions in the seismic area.

MS. DES JARDINS: I'd like to go back to the Eurasia Tunnel study, DDJ 173.

I'd like to go page 71, which is there, and go down -- scroll down to waterproofing. Okay.

So there are very specific things done to the Eurasia Tunnel for waterproofing. Slab cement will be used as backfill material and then segment cement to provide watertightness, and it will be fully enclosed

within PVC waterproofing.

Are you familiar that this tunnel had a PVC liner?

WITNESS BEDNARSKI: Yeah, I think you're misinterpreting the type of tunneling techniques in the first paragraph with that last sentence there on page 2-27.

It appears to me that the first paragraph is talking about the TBM-driven tunnels, which are the ones that I reference in my testimony. And that I believe in our CBR, DWR-212, we also talk about the need for the high-density concrete that would be used in the segment. And this was also talked in the Era report that was discussed at length this morning about the need for highly dense concrete and that that will be taken into account during our preliminary and final design of the tunnels.

Now, that last sentence that says that NATM tunnel, that is a completely different tunneling technology and one that will not be employed on the California WaterFix tunnels. So that waterproofing method is not appropriate for the WaterFix tunnels.

MS. DES JARDINS: What does NATM mean?

WITNESS BEDNARSKI: It means New Austrian tunneling method. It's a hand-driven type of tunneling

used with like -- it's not with a tunnel-boring machine. It's with excavator equipment.

MS. DES JARDINS: Okay. Thank you very much.

Let's go to Exhibit -- let's go back to DDJ 170, which is a copy of Mr. Bednarski's testimony. And let's go to page 3 and scroll down. There's -- down more.

There's something about leakage analysis, which I'm not seeing, but you did do a comprehensive leakage analysis which is DWR-659?

WITNESS BEDNARSKI: We did.

MS. DES JARDINS: Can we bring up DDJ 174?

Excuse me. First, let's go up to page 3. Scroll down.

Let's go back to page 12. I apologize.

So in the initial analysis, you assumed -- you had a stronger liner strain. It says it was greater than 1.5 times 10 to the minus 4. And on this analysis, you assumed the liner strain was less.

So I'm wondering, how did you derive the smaller strain on the liner?

WITNESS BEDNARSKI: Maybe this would be a good time to kind of recap how the project evolved from the 2012 to the present time. This is one of the reasons that we did reconfigure the project.

At the time the work was done in 2012, along with the intakes at the river, we had pumping plants at the river you may recall. And those -- the purpose of those pumps was to lift the water out of the river and deposit that water through the north tunnels into the Intermediate Forebay. And from that location, the water would flow by gravity through the two main tunnels down to Clifton Court.

Now, with that configuration, we were lifting the water to a relatively high elevation. And so that meant that the pressure in the 40-foot diameter tunnel south of the Intermediate Forebay would be a relatively high pressure and the north tunnels would be seeing all of that pressure from the pumps.

So this analysis that was done in 2012 recognized those relatively high-pressure conditions. And you can see that represented in the line that says: "Internal design pressure head ranging from 194 feet to 205 feet."

So, in our thought, they were highly pressurized gravity-fed tunnels downstream of the Intermediate Forebay.

You can see the maximum differential water pressure. That's the difference between the water pressure in the pipe and the surrounding subsurface

water. So there was a net positive pressure inside the tunnels at 50 feet. So the segmental liner had to withstand that condition under the 2012 variations of the project.

Now, in an effort to do two things -- reduce the pressure in the tunnel and reduce the environmental impacts of having three large pump stations along the river -- the program was reconfigured so that the pump stations were moved to the Clifton Court Forebay.

And in doing so, you can see that the pressure in the tunnels dropped from the 194 feet range to 205 down to 120 -- 120 feet down to 154 feet. But the important thing is that the maximum differential water pressure in the tunnels was reduced from 50 feet to 9 feet.

That allowed us to completely relook at the entire lining system for the tunnels and then run this new leakage analysis with the -- with Era, the consultant that we hired, to come up with a new estimate for the anticipated leakage out of the tunnels or inflow into the tunnels.

So the two systems are completely different, and stresses and strains on the segmental liner are completely different, and that's why you see different numbers there.

That's the long answer to your question.

MS. DES JARDINS: Is this assuming constant strain on the entire tunnel length?

WITNESS BEDNARSKI: Did you say "constant strain"?

MS. DES JARDINS: Is this assuming homogenous strains across the entire tunneling?

WITNESS VALLES: The strain would vary along the length of the tunnel depending on how much differential head is applied to the particular section. The 9 feet, that's basically at the end.

MS. DES JARDINS: But it assumes it varies gradually with the change?

WITNESS VALLES: In length.

MS. DES JARDINS: Yes. You looked at the tunnel shaft interactions because the shaft, as I understand it, is pinned down by a large block of concrete.

WITNESS VALLES: Yeah. The block of concrete is there to prevent flotation of that shaft. It helps hold that shaft down.

In preliminary and final design -- right now we're only currently in conceptual design -- we will be looking at soils structure interaction; we will be looking at doing some very detailed finite element

analysis that will look at all the loading conditions, both seismic and any sort of movement of that settlement of the tunnel section and how it interrelates to that shaft.

MS. DES JARDINS: So this is sort of a preliminary leakage analysis and not a comprehensive leakage analysis?

WITNESS VALLES: It's preliminary, but it's very conservative.

MS. DES JARDINS: Okay. Let me go to page 6 of the document. Scroll down.

And these are long-term steady state flow rates and not during irregular transient or periodic leakage rates. So this is essentially for when the tunnels are flowing and operating in a steady state; is that not correct?

WITNESS VALLES: That's correct.

MS. DES JARDINS: So this doesn't cover the kind of leakage you might experience when the tunnels are first constructed and before they're filled?

WITNESS VALLES: The specification for the tunnel will include during operation and construction. And especially during construction, we're looking at years of empty tunnels, and those are basically similar to any sort of transportation tunnels which have to take

into account empty conditions.

You pointed out the Eurasia Tunnel. That has basically twice the amount of head outside of the tunnel that ours will have. And the leakage from our understanding is pretty minimal to none.

WITNESS BEDNARSKI: And I think if I could add, if we could go to DWR-6 errata, we had some other information here as to what could be expected. Page -- Slide 47 and 48.

When the tunnels are dry -- this is the Seattle tunnel. 57 feet diameter. It's about 53 feet inside. This would be the typical amount of leakage into the tunnel. They're in saturated ground conditions also underneath the city of Seattle. We've projected about three CFS projected over 73 miles which equates to about 18 GPM per mile, a pretty low rate.

And our specifications -- if you go to the next slide, these are two tunnels in Hong Kong going underneath the ocean there. Similarly, you can see very low leakage rates under deep water but fully pressurized on the outside.

This would be the type of construction that we would typically be expecting to specify and the type of result that we would get from the construction methodologies which we are planning for the WaterFix

tunnels when they're dewatered.

MS. DES JARDINS: Go to Exhibit DDJ 156.

This is the draft -- final draft agreement regarding construction of the conveyance project.

Are you familiar with this agreement?

WITNESS BEDNARSKI: Generally speaking, yes.

MS. DES JARDINS: I'd like to go to page 21 because it specifies...

So it states: "The tunnel liner system will be designed for all the following." And it states at the bottom "including earthquake design, construction loads, net internal pressure, and, finally, leakage control based on acceptable performance criteria."

Is that leakage criteria defined yet for the project?

WITNESS BEDNARSKI: We have not defined it per se. We are working towards that and will finalize it in preliminary design. I think that through the conceptual engineering and through these most recent studies, I think we've been able to demonstrate what is possible to be specified and constructed. And we'll be aiming at that or a result that will be better than that in the final design and construction.

MS. DES JARDINS: But for this project currently there's no leakage criteria?

WITNESS BEDNARSKI: There was no leakage criteria specified per se, no. I couldn't point you to a number and say this is what our goal is. It's to minimize it to the greatest extent possible with a single-pass liner system.

MS. DES JARDINS: Let me go to Exhibit DDJ 141. This is a draft report of the initial engineering dated from 2010.

I believe, Mr. Bednarski, that you were on the list of reviewers for this document.

WITNESS BEDNARSKI: That dates about the time I came on the project, so I may have but I tend to doubt it.

MS. DES JARDINS: Let's go to page 34.

It states on page 34: "A second pass system using a steel liner installed in the areas of higher pressure should be maintained as an option until development of the design and testing the feasibility of a favored lining option."

It is -- is the option of a steel liner still under consideration?

WITNESS BEDNARSKI: Let me say before I answer that question that this report reflects a completely different project configuration than what we're discussing today for the California WaterFix.

This project, if I remember correctly, had two sets of pumping stations along to river to deliver water to the Intermediate Forebay and then a second set of pumps that would pressurize that water again and put it into two 33-foot diameter tunnels.

The design concept was not fully completed. Again, this is the time I came on the project. I think the designers at the time are anticipating that there could be issues with leakage in that highly pressurized tunnel environment. And they were recommending to take a look at a steel liner due to the leakage.

We have since modified the configuration of the project at least twice. And one of the goals, among other things, was to reduce the potential for leakage and also to reduce the pumping requirements for the system. And we think that now we have come up with what is a fairly optimized system for the tunnel and pumping system.

So, no, there is not a steel liner that is planned at the present time.

MS. DES JARDINS: Let's go to page 33, please, because it shows the analysis you're discussing.

So these were -- the original analysis showed how the -- a considerable amount of exfiltration or leakage. Is this -- and this is your recollection?

WITNESS BEDNARSKI: Yes, I think this table corroborates what I just expressed.

MS. DES JARDINS: Let's scroll down a little further.

CO-HEARING OFFICER DODUC: Before you continue with Mr. Bednarski, you have said this document describes a project that is not the project before us. So why are we pursuing this line of questioning? This is not before us.

MS. DES JARDINS: The leakage criteria are before you, and that is what I wanted to ask about because this says that leakage criteria will need to be developed. And that's what I wanted to ask about, not about the project design as it was but about the statement by the engineer that leakage criteria will need to be developed and adopted during preliminary engineering. I believe that's relevant.

CO-HEARING OFFICER DODUC: And I believe that has been testified to.

MS. DES JARDINS: No, it has not. I would like to ask specifically -- this statement says: "Leakage criteria will need to be developed and adopted during preliminary engineering." And it cites the technical literature.

And so it seems like you should designing to

an objective leakage criteria, and -- and that's what this states.

MR. MIZELL: Objection. No question pending.

MS. DES JARDINS: Why -- why was a leakage criteria not adopted during the preliminary engineering as it states this needs to be done?

WITNESS BEDNARSKI: That will be the next phase of the project, is to enter into preliminary design. We've only completed the conceptual engineering at this point. And so we anticipate that's going to be one of the first activities along with the seismic hazard analysis and a number of these other items that have been brought up today will be tackled in preliminary design.

MS. DES JARDINS: Is there some reason that you can't commit to, for example, meeting the American Water Works Association criteria --

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

MR. MIZELL: Beyond the scope of this rebuttal.

CO-HEARING OFFICER DODUC: Sustained.

Move on.

MS. DES JARDINS: Thank you.

Next thing I'd like to go to is DWR-75,

page 13.

CO-HEARING OFFICER DODUC: Mr. Milligan, I apologize. Mr. Keeling and Ms. Des Jardins took twice the amount of time they estimated, but we will get to you, I hope.

MS. DES JARDINS: Page -- line 6 to 9, states detailed settlement for these engineering practices -- "Detailed settlement monitoring programs were implemented before and during construction to ensure that construction-induced settlements do not exceed the thresholds established to predict existing levees and other structures located near the project sites."

So this is with respect to successful engineering projects, that they had detailed settlement monitoring programs. You have yet to develop these thresholds?

WITNESS PIRABAROOBAN: Yes, we are planning to do that as part of the preliminary and final engineering along with the, for example, section following coming from the Army Corps of Engineers. Most likely they will specify what are those thresholds when it comes to settlement for the levees.

MS. DES JARDINS: Okay. So I want to go back to the section of the final EIR/EIS, DDJ 158. And it's page 289. Scroll down. Yeah, so --

CO-HEARING OFFICER DODUC: You need to get closer to the microphone. You also need to think about wrapping up.

MS. DES JARDINS: This is close to -- let's go up -- to the top bottom of the previous page.

It says on the bottom of page 289: "Conformance with the following design manuals would be used to predict the maximum amount of settlement that could occur for site-specific conditions to identify the maximum allowable" -- continue -- continue to the next page -- "settlement for individual critical assets and develop recommendations for tunneling to avoid excessive settlement." And it lists several tunneling manuals.

Are there any commitments to anything other than developing recommendations for tunneling?

WITNESS PIRABAROOBAN: I think if you -- there's a commitment in Appendix 3B of this final EIR/EIS about the settlement monitoring.

MS. DES JARDINS: Can you bring that up so I can --

WITNESS PIRABAROOBAN: Section 3B.2.1.1.

MS. DES JARDINS: So to SWCR 4, please. It's in the final EIR/EIS. So that is not submitted for this proceeding.

WITNESS PIRABAROOBAN: I believe it was.

MS. DES JARDINS: Where is it submitted?

WITNESS PIRABAROOBAN: SWRCB, that's the board's exhibit.

MS. DES JARDINS: It's not up there. I don't believe that anybody's submitted it, and I don't believe that DWR submitted that -- submitted the final EIR/EIS for the record, not Section 3B that you're referring to. And I don't believe that the State Water Board posted it.

CO-HEARING OFFICER DODUC: So noted. What was your question?

MS. DES JARDINS: I was going to ask him about what the actual commitment was. Because the part that I submitted that is in the record indicates that they'll only develop recommendations. But I believe we'll have to leave it with that because the other -- other Part 3B is not in the record.

CO-HEARING OFFICER DODUC: So noted. Does that conclude your cross-examination?

MS. DES JARDINS: There are more questions I would like to ask. I know it's been long.

CO-HEARING OFFICER DODUC: Specifically, what area will you be exploring and how concisely and directly will you be getting there?

MS. DES JARDINS: I would like to ask about

some of the other mitigation that was done in the Eurasia Tunnels.

CO-HEARING OFFICER DODUC: Why is that relevant to what is before us?

MS. DES JARDINS: Only to the extent that the board regards these other projects that were completed successfully as similar to the current project. If the board will take as granted that there were completely different and much more specific requirements for mitigation of discharges, settlement of noise, of vibration, monitoring of --

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

We take nothing for granted.

But, Mr. Bednarski, to what extent are you able to address the mitigation aspect of that particular project?

WITNESS BEDNARSKI: I am not familiar with mitigation measures that they used there. I would only be familiar with the ones that we would be proposing in our EIR/EIS.

CO-HEARING OFFICER DODUC: So your request to ask questions on that topic is declined.

What is your next topic?

MS. DES JARDINS: I would like to pull --

CO-HEARING OFFICER DODUC: What is the

question you're intending to ask?

MS. DES JARDINS: It's with respect to the assertion that there will be an external peer review as part of the U.s. Army Corps of Engineers.

CO-HEARING OFFICER DODUC: That's been addressed earlier this morning. To the extent that the Corps requires requests -- that analysis, that peer review will be done.

MS. DES JARDINS: Page 8 --

CO-HEARING OFFICER DODUC: Let's not pull up any document.

MS. DES JARDINS: -- says that an external peer review is not required for a Section 408. I wanted to pull it up and ask him about that.

CO-HEARING OFFICER DODUC: No, it's already been asked. He said that this morning; that if one is required, it will be done.

Next topic.

MS. DES JARDINS: I was going to ask if it's not required, how will that be addressed because --

CO-HEARING OFFICER DODUC: If it is required, it will be done.

Next topic.

MS. DES JARDINS: Okay. So I do object to that, just respectfully.

CO-HEARING OFFICER DODUC: We've had a discussion about "respectfully," but go on.

Ms. Aufdemberge.

MS. AUFDEMBERGE: I would like to -- Mr. Milligan has to leave at 5:00 right away. If we could let him leave --

CO-HEARING OFFICER DODUC: Hold on a second. I believe Ms. Des Jardins -- and she is the last cross-examiner.

MS. DES JARDINS: That does complete my cross-examination.

CO-HEARING OFFICER DODUC: Mr. Mizell, do you wish redirect? If so, what is your proof?

MR. MIZELL: No redirect at this time.

CO-HEARING OFFICER DODUC: With that, I have noted two objections with respect to admissibility of testimony exhibits. One was by EB MUD objecting to DWR-659 and the testimony in reference to the ARUP. And second objection was by Mr. Keeling, joined in by Ms. Meserve, Mr. Jackson, and Ms. Des Jardins.

Did I forget anybody?

With respect to the other projects and the statement and the applicability to the issue of injury and harm to other involved stakeholders, are there any other objections at this time to the admissibility of

these witnesses' testimony or exhibits?

I'm sorry. It's the third objection. What was the third objection?

DANA HEINRICH: Well, I'm a little unclear on the resolution of this. According to my notes, Mr. Keeling also objected to certain statements about the budget of some of the other tunnel example projects.

CO-HEARING OFFICER DODUC: I sort of wrapped all that into objection with respect to the testimony regarding the other project and their -- their reference or their use to portray a potential successful WaterFix project.

DANA HEINRICH: One went to scope and one went to the sources.

CO-HEARING OFFICER DODUC: Okay. I defer to my attorney. Make that three objections.

Are there any other verbal objections at this time? I know that according to our previous ruling we did say that we would consider objections on admissibility up to the day that exhibits are offered into evidence, and we'll stand by that.

However, I would encourage you, if you were to have objections to the admissibility of exhibits or testimony by these witnesses or any witnesses, for that matter, to get those written objections in as soon as

possible in order to allow us to time to consider it.

With that, then, thank you very much. You are dismissed.

And we will now move on to Mr. Milligan.

Five-minute break at the court reporter's request.

(Off the record at 4:31 p.m. and back on the record at 4:36 p.m.)

CO-HEARING OFFICER DODUC: We're resuming, Ms. Aufdemberge.

Do you wish to make an opening statement?

MS. AUFDEMBERGE: No, I have no opening statement.

MR. MILLIGAN: Good afternoon, again.

My name is Ron Milligan. I'm the operations manager for the Central Valley Project, and I work for the U.S. Department of Reclamation.

MS. AUFDEMBERGE: I do have one question for you. Is DOI 32 a true and correct copy of your rebuttal testimony?

MR. MILLIGAN: Yes, it is.

JASON BAKER: Ms. Aufdemberge, did you mean 33? Wasn't there a renumbering due to --

CO-HEARING OFFICER DODUC: Mr. Milligan, please confirm that you have taken the oath.

RON MILLIGAN,

called as a witness by the Bureau of Reclamation, having been previously duly sworn, was examined and testified as follows:

--o0o--

DIRECT EXAMINATION

WITNESS MILLIGAN: I had several points and rebuttal testimony that I'd like to cover. I will summarize the written text. In a few areas there are also some graphics, and I will also stipulate that some of these items are fairly well interwoven with some of the modeling testimony that is to come. But these are very specific to, I believe, operational constructs that will then feed into the modeling.

So the key areas that we want to talk about on rebuttal were the operational philosophy and water supply reliability as the CVP would be operated. That would be the first.

Several points I'd like to make about fall exports, how they relate to allocations for CVP water users, decisions that we would make operationally on conveying CVP water in the fall in consideration with how we would carry water over in the upstream reservoirs in the CVP system in this grouping. Also going forward and making the release of stored water in the fall to be

able to use the California WaterFix.

And then finally a point as it relates to health and safety pumping levels. It seems to have been discussed and characterized in some of the previous testimony.

Starting off with operations.

DORENE D'ADAMO: Just for clarification. I was a little confused on the numbers because the document we have says that Mr. Milligan's testimony is Exhibit 36 but the document itself, unless there's an errata, it says DOI 32.

So just because people might be following and pulling up exhibits.

JASON BAKER: DOI 32 was established as your opening statement back in July of last year. We had communication that we would relabel it 36, which I believe Ms. Aufdemberge agreed to, which is the next one in the sequence. But if you could resubmit the same file just with that strike through.

MS. AUFDEMBERGE: I will do that. Thank you.

WITNESS MILLIGAN: So under the philosophy and doing or creating water supply reliability for the CVP, the Central Valley Project was developed in part as it relates to water supply to improve water supply reliability, particularly through droughts.

This is done through the use of reservoir storage and the system conveyance that is all part of the Central Valley Project. We do operate in conjunction with the State Water Project during periods of wet times, both rainy, and both in a whole range of hydrology to be able to pick up water that we can't otherwise store. And then also use stored water to help meet supplies.

And this is a key component of how we would operate the project. And this does not necessarily change significantly with the use of California WaterFix conveyance in the delta. And this is something that I think we would want to want to maintain.

We have been operating in this manner for a number of years going back to many decades, although there have been some times where regulatory -- regime has become tighter, particularly in the excess -- what would be otherwise excess conditions in the delta through Decision 1641, biological opinions, advent of the Central Valley Improvement Act.

But we have always operated the project in the manner, recognizing that we had upstream storage capability. But we also had obligations, contractual and regulatory, in the upstream basin upstream to the delta. And this is where we differ slightly from just

our customer base, if you will, from the Central Valley Project versus the State Water Project in that we view a premium on water held in storage in the event we're going into a dry cycle, and keeping that upstream storage does provide us a great deal of flexibility.

Another aspect of this is that the project is is measured in large part by how well it can meet deliveries during drought sequence. This was again emphasized in the Central Valley Improvement Act which defines at least for the act, Central Valley improvement project yield as meeting the delivery capability of the project through the 1928 to 1934 drought period for a whole host of purposes.

But it's delivery of water through the drought that is in large part what measures what are our yield for the project is and not necessarily a construct that looks at high flow and high deliveries during the wet years perhaps at the expense of delivery during the dry years. So not looking to maximize average annual deliveries, but we are looking at trying to provide some base resource, if you will, for drought sequences for all of our project customers and not any particular geographic base.

Philosophically, you know, that has been something that even in the worst drought years -- 2014,

2015 -- with the most extreme hydrologic conditions and zero allocations to many, many of our service contractors and reduced allocations or deliveries to settlement contractors, reclamation recognized that taking reservoir storages down to dead pool levels even if -- in the face of extreme hydrologic conditions and very little snow pack was not in the best interest of the system as a whole or the Central Valley Project.

So these are things that we did certainly think through. And this is something that doesn't radically change with the potential influence claimed diversion for the Central Valley Project as it relates to California WaterFix. But there seems to have been some thinking that this would -- the actual new conveyance would have us do that.

And it does appear that that is in large part centered around the potential to move substantial amounts of water, CVP water, in the fall given some -- some testimony that we've seen.

This comes about with the idea that allocation south of Delta particularly could be significantly augmented with the use of joint point in the July August and September months.

And we've seen some of that analysis and this is the area where it does delve into a bit where we have

a crossover with the modeling. Hopefully we'll be able to answer questions both with my testimony and our modeling rebuttal.

But a large part of this is looking at the ability to utilize unused state conveyance potentially in the July and August and September time frame and to be able to effectively use that to augment and project much higher allocations.

It's been our experience that that is a difficult period of time to be able to dependably augment allocations or effect an allocation process primarily because it's the use of the state project facilities, and given uncertainties about hydrology, and the well-established practice that the State Water Project would utilize their conveyance capacity first for their project operation and then at the benefit of their contractor sets which are paying for those facilities, that the ability to use joint point even today is somewhat uncertain and it is not something we would ordinarily be able to take advantage of.

So with the -- in a framework where the July-August time frame, which would be critical periods of time to get initial water that may be available for the project, is not a time frame where we think is going to be dependable for us to be able to make an increased

allocation.

And what we would end happening, I believe, is that we would see that if some joint point did become available and it did factor into our thinking in terms of operations for projects, either from a temperature management standpoint, instream flows, or coming off wet year similar to this year where we're managing the release of water to come into the next flood season, any utility of an increase or a windfall of some joint point, I believe would be actually building into the next year's potential allocation and building up carryover into the next year in San Luis than it would be to actually augment allocations.

In that sense, I think that some of the modeling we've seen is overstating the benefits of the CVP and our ability to make effective use of that. Because what we would probably see is planting decisions by CVP contractors south of Delta in a manner that they wouldn't be able to make use of the late allocation and would find it necessary to carry water over into the next year. So we would undoubtedly find ourselves in the position where we're carrying over larger quantities of water potentially from one summer or fall into the next year.

And many times finding that some of the

dynamics we have talked a great deal about in terms of picking up additional excess flows in the winter periods that are afforded because of the WaterFix conveyance become rendered a little bit shifted in use because it's now running interference with the limited capacity volume and San Luis Reservoir, particularly on the federal side.

So it's our observation that when we would get to a fall period and there is some water -- increments of water left in storage, our belief is going into a world with new conveyance available for California WaterFix, at least with the operating criteria that we've discussed so far, that we would actually find a premium to probably rely at least on an operational scenario where we would leave some water in storage upstream within our CVP reservoirs and like to be able to take advantage of the excess flows that may come available and could be now picked up with the opportunity of the new conveyance to be able to put that into storage into San Luis.

CO-HEARING OFFICER DODUC: Hold on, Mr. Milligan.

Mr. Bezerra?

MR. BEZERRA: Yes. Thank you, Chair Doduc.

I'd like to object to some of this testimony.

This is supposed to be a summary of Mr. Milligan's written testimony. He stated just now that in light of some of the operating criteria that we have observed, X, Y, and Z happened.

As I understand it, the projects have not proposed any particular operations criteria for California WaterFix. There is modeling criteria, but they have stipulated that there -- they have not proposed any terms and conditions on the operation of WaterFix. And to the extent that Mr. Milligan is testifying now about what operating criteria would apply, we are well beyond a summary of his written testimony.

CO-HEARING OFFICER DODUC: Response, Ms. Aufdemberge? I didn't interpret what he said -- but go ahead.

MS. AUFDEMBERGE: Right. I'm not sure that operating criteria and conditions on approval are -- I'm not sure that were suggested.

CO-HEARING OFFICER DODUC: Mr. Milligan, would you like to clarify?

WITNESS MILLIGAN: If I could clarify. I think what we see in terms could be characterized as modeling criteria or representations that we've seen that I don't believe are consistent with how we would

philosophically operate the project.

CO-HEARING OFFICER DODUC: And you are still of the assertion that the petitioners, at least the Department of Interior, is not proposing through your statements operational criteria?

WITNESS MILLIGAN: That is correct.

CO-HEARING OFFICER DODUC: Please continue, Mr. Milligan.

WITNESS MILLIGAN: I think the last area that I'd like to summarize and touch upon would be some characterization again in some of the modeling by some parties that characterize it as health and safety levels and what may be appropriate. In my estimation, those estimates have been too low at least as it relates to something that we would utilize in a modeling tool such as CalSim.

Specifically, to be able to show combined exports of pumping for the Central Valley Project and State Water Project of below 1500 CFS in any particular monthly time step. I think this is very difficult for the projects to maintain over the long-term. It's certainly something that we have given a lot of thought to over time.

As it relates to the CVP specifically to be able to go to a pumping rate that's less than 850 CFS

does create significant difficulties for the project. And although we have, as I said, the last several years in some very extreme conditions have had a couple of incidents of short term where we've had to cycle a pump unit to be able to hit that kind of a number, I think that some of the review -- and, again, this will come up with the modeling and summary of some of the graphs that have been my testimony from some of that work that shows that some of the representations that have been presented would suggest that that could happen far more often. And this is the type of operations that we would want to avoid in real-life situations.

And there's a couple graphs within my testimony that talk to each of these points a bit.

But rather than get into those -- again, this is summary, and I'd rather not pull those, the graphics, up to help with the time situation. But those are the areas that primarily we're concerned about in some of the modeling representations given what we believe we would operate going forward. And I believe they were characterized in some degree as these would be consistent with our operation philosophy today, and these were just several areas that we were very concerned about that impression.

CO-HEARING OFFICER DODUC: Thank you. Does

that conclude your testimony?

WITNESS MILLIGAN: It does.

CO-HEARING OFFICER DODUC: We will not start cross-examination.

For those of you that are here, please come up and identify yourself and if you plan to conduct cross-examination and give me a time estimate.

MR. HITCHINGS: Excuse me. Good afternoon. Andrew Hitchings for GCID and Biggs-West Gridley District. I would estimate about 45 minutes to an hour. And I'll be taking the lead cross for the Sac Valley Water User Group. There may be other attorneys within that group that will have some follow-up questions.

CO-HEARING OFFICER DODUC: Okay.

Mr. Herrick, good to see you again.

MR. HERRICK: Thank you. Good to see all of you.

John Herrick, South Delta parties. Maybe 5 to 10 minutes. Not much. Thank you.

CO-HEARING OFFICER DODUC: I love Mr. Herrick.

MR. WASIEWSKI: Tim Wasiewski for the San Joaquin Tributary Authority. About 15 minutes.

But I wonder if it might be better if we did Mr. Milligan's cross when we did the other operator's cross just because I might have some questions about

Mr. Leahigh's testimony which went to joint operations, and I don't want him to defer to Mr. Milligan who will then be gone.

So if his schedule can accommodate it, I think it might be better.

CO-HEARING OFFICER DODUC: We'll take it under advisement, but I'm not inclined to do so.

However, we've had this happen in the case in chief presentation, and I think we need to do a better job of noting the questions that are asked and making sure that it is answered.

MR. WASIEWSKI: Thanks.

CO-HEARING OFFICER DODUC: Mr. Bezerra?

MR. BEZERRA: Yes, thank you. I'll be following Mr. Hitchings. I anticipate probably half an hour to 45 minutes.

CO-HEARING OFFICER DODUC: Ms. Meserve?

MS. MESERVE: I probably only have about 10 minutes.

CO-HEARING OFFICER DODUC: All right.

Ms. Akroyd?

MS. AKROYD: I won't be having any cross.

CO-HEARING OFFICER DODUC: I like you even more than Mr. Herrick.

Meredith Nikkel for the Tehama Colusa

Authority perhaps 5, 10 minutes.

CO-HEARING OFFICER DODUC: Ms. Des Jardins?

MS. DES JARDINS: I would like to be -- I'm going to be safer and estimate 40, 45 minutes this time.

CO-HEARING OFFICER DODUC: I can't hear you.

MS. DES JARDINS: 45 minutes.

CO-HEARING OFFICER DODUC: Not 90, right?

MS. DES JARDINS: The engineering was extremely detailed -- that testimony.

CO-HEARING OFFICER DODUC: Thank you all.

I will remind you that we will be starting at 9:30 a.m. on Thursday, and we will be in the Coastal Hearing room.

(Whereupon, the hearing was closed at 4:57 p.m.)

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CERTIFICATE OF REPORTER

I, Megan Alvarez, a Certified Shorthand Reporter, hereby certify that the foregoing proceedings were taken in shorthand by me at the time and place therein stated, and that the said proceedings were thereafter reduced to typewriting, by computer, under my direction and supervision;

I further certify that I am not of counsel or attorney for either or any of the parties to the said proceedings, nor in any way interested in the event of this cause, and that I am not related to any of the parties thereto.

DATED: _____

_____
MEGAN F. ALVAREZ, RPR
Certified Shorthand Reporter
License No. 12470