

SUPREME COURT OF THE UNITED STATES
No. 142, Original

STATE OF FLORIDA,)
)
Plaintiff,)
)
V.) VOLUME XIII
)
STATE OF GEORGIA)
)
Defendants.)

TRANSCRIPT OF PROCEEDINGS

The above-entitled matter came on for HEARING before SPECIAL MASTER RALPH I. LANCASTER, held in the U. S. Bankruptcy Court, at 537 Congress Street, Portland, Maine, on November 21, 2016, commencing at 8:45 a.m., before Claudette G. Mason, RMR, CRR, a Notary Public in and for the State of Maine.

APPEARANCES:

For the State of Florida: PHILIP J. PERRY, ESQ.
JAMIE L. WINE, ESQ.
ABID R. QURESHI, ESQ.
CHRISTOPHER J. FAWAL, ESQ.
DEVIN M. O'CONNOR, ESQ.
GEORGE C. CHIPEV, ESQ.

For the State of Georgia: CRAIG S. PRIMIS, ESQ.
DEVORA W. ALLON, ESQ.
BRITNEY A. LEWIS, ESQ.
ANDREW PRUITT, ESQ.
K. WINN ALLEN, ESQ.
CHRISTOPHER J. MANER, ESQ.

Also Present: JOSHUA D. DUNLAP, ESQ.

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1 PROCEEDINGS
2 SPECIAL MASTER LANCASTER: Good morning.
3 MR. PRIMIS: Good morning. Are we ready
4 to proceed?
5 SPECIAL MASTER LANCASTER: I ought to
6 say something, I suppose, about the weather.
7 Merry Christmas.
8 I concluded that my November trend is no
9 longer working and, clearly, not
10 strategically significant. It's only going
11 to get worse.
12 MR. PRIMIS: We want the full
13 experience, your Honor.
14 SPECIAL MASTER LANCASTER: Will you
15 remind me of the names of the two witnesses?
16 MR. PRIMIS: Certainly. Your Honor,
17 this morning we will call Dr. Wei Zeng to the
18 stand. He spells it W E I, Z E N G; but it's
19 pronounced Zeng. And when he's finished, we
20 will be calling Katie Kirkpatrick, who is
21 from the Metro North Water District.
22 SPECIAL MASTER LANCASTER: Thank you.
23 MR. PRIMIS: And just one or two
24 housekeeping items before I ask Dr. Zeng to
25 take the stand. The first, I'm happy to

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1 report that through some work with the Court
2 staff, we were able to obtain a third
3 microphone for you.
4 SPECIAL MASTER LANCASTER: Thank you.
5 MR. PRIMIS: So you can look at the
6 witnesses when you talk to them.
7 We're also going to try today to have
8 Dr. Zeng use a mike -- a mobile microphone in
9 case he gets up. So we're going to see if
10 that works. And if it doesn't, please let us
11 know; and we'll put it back so he can talk
12 with the microphone.
13 And finally, there was a document that
14 the Court asked Mr. Turner about at the end
15 of the proceedings last week. And I just
16 wanted to clarify, make sure we were talking
17 about the same document.
18 SPECIAL MASTER LANCASTER: We are.
19 MR. PRIMIS: The Court had asked about,
20 I think, this document which says February
21 1958 revised 2016.
22 SPECIAL MASTER LANCASTER: That's it.
23 MR. PRIMIS: Is that correct?
24 Okay. Just to clarify, I think
25 Mr. Turner may have known what you were

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1 talking about; but just so I can show you on
 2 the screen, this is part of -- that revision
 3 is part of the October 2015 Army Corps report
 4 out.
 5 SPECIAL MASTER LANCASTER: Yes.
 6 MR. PRIMIS: And it says 2016 on the
 7 Water Control Manual. When it goes final, it
 8 will then have a final 2016 date. I think he
 9 was confused because that was published in
 10 October 2015, and not at some point in 2016.
 11 The good news is that Dr. Zeng knows
 12 about these very documents. And if the Court
 13 has questions, he may even be a better person
 14 to ask.
 15 SPECIAL MASTER LANCASTER: Thank you.
 16 MR. PRIMIS: But I thought I would
 17 clarify that before we got started.
 18 SPECIAL MASTER LANCASTER: Thank you.
 19 MR. PRIMIS: The State of Georgia now
 20 calls Dr. Wei Zeng to the stand.
 21 THE CLERK: Please raise your right
 22 hand.
 23 Do you solemnly swear that the testimony
 24 you shall give in the cause now in hearing
 25 shall be the truth, the whole truth, and

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1 nothing but the truth, so help you God?
 2 THE WITNESS: I do.
 3 THE CLERK: Please be seated.
 4 Pull yourself right up to the microphone
 5 and please state your name and spell your
 6 last name.
 7 THE WITNESS: Wei Zeng. W E I, first
 8 name; Zeng, Z E N G, last name.
 9 Your Honor, can you hear me with this
 10 mike?
 11 SPECIAL MASTER LANCASTER: Yes.
 12 I'm sorry about this. You'll have to
 13 look at me now.
 14 THE WITNESS: I have no problem doing
 15 that.
 16 DIRECT EXAMINATION
 17 BY MR. PRIMIS:
 18 Q. Dr. Zeng, I have placed before you your written
 19 direct testimony that you submitted in this
 20 case. And I just want to ask you do you accept
 21 or adopt the written direct as your sworn
 22 testimony?
 23 A. I do.
 24 MR. QURESHI: Good morning, your Honor.
 25 SPECIAL MASTER LANCASTER: Good morning.

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1 CROSS-EXAMINATION
 2 BY MR. QURESHI:
 3 Q. Good morning Dr. Zeng.
 4 A. Good morning.
 5 MR. QURESHI: Your Honor, with your
 6 permission, I would like to pass out the
 7 examination binders.
 8 SPECIAL MASTER LANCASTER: Please.
 9 BY MR. QURESHI:
 10 Q. Dr. Zeng, you were in the courtroom on Friday?
 11 A. Yes, I was, yes.
 12 Q. I would like to pick up where we left off on
 13 Friday after the testimony of your colleagues at
 14 Georgia EPD. You have worked at EPD for more
 15 than 10 years, sir?
 16 A. Yes.
 17 Q. And from 2012 to 2016 you worked with Mr. Jud
 18 Turner, the director of EPD at that time?
 19 A. That's correct.
 20 Q. And during that period, sir, did you report
 21 directly to him?
 22 A. Well, there's an agency structure; but sometimes
 23 I do report directly to him.
 24 Q. And did you have regular meetings with him?
 25 A. I would say yes.

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1 Q. Okay. Do you recall him testifying on Friday
 2 about a meeting with the Governor's chief of
 3 staff in 2013?
 4 A. I'm not sure what you're referring to.
 5 Q. Do you recall Director Turner discussing a
 6 briefing paper on the protection of external and
 7 internal threats to agricultural water use?
 8 A. I don't.
 9 Q. Okay. Sir, can you please turn to tab 2 of the
 10 big binder I handed to you; and there you will
 11 see a document that's designated by Exhibit
 12 FX-54.
 13 A. I see that.
 14 Q. Have you seen this document previously, sir?
 15 A. Can I take some time and go through it?
 16 Q. Absolutely, sir.
 17 A. All right. Thank you.
 18 Q. Please take as much time as you need. The
 19 relevant portion that I want to highlight is on
 20 the fourth page that ends in the numbers in the
 21 lower right-hand corner 478438.
 22 A. Okay.
 23 Q. At the top of that page there is a section
 24 entitled Protect Against External and Internal
 25 Threats to Agricultural Water Use. Do you see

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- 1 that?
- 2 **A. I see it, yes.**
- 3 **Q.** Okay. Did Director Turner ever identify for you
- 4 any external or internal threats to agricultural
- 5 water use?
- 6 **A. I don't think so.**
- 7 **Q.** Okay. Did you discuss this topic with anyone
- 8 else at EPD?
- 9 **A. I don't think so.**
- 10 **Q.** Did you consider this one of your
- 11 responsibilities at EPD?
- 12 **A. For a hydrologist -- a hydrologist to think about**
- 13 **external threats, probably not.**
- 14 **Q.** Okay. What about internal threats, sir?
- 15 **A. I don't think so.**
- 16 **Q.** Do you recall Director Turner testifying about
- 17 the Governor's task force to investigate roughly
- 18 90,000 illegally irrigated acres?
- 19 **A. Well, I'm aware of a task force that is to be --**
- 20 **that is to be working, investigating the alleged**
- 21 **unpermitted acreage; but that's the extent of my**
- 22 **knowledge.**
- 23 **Q.** And you're aware that the task force was actually
- 24 convened in October 2016?
- 25 **A. I'm not aware of that.**

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- 1 **A. That was the only name that I picked up.**
- 2 **Q.** Has Mr. Barnes contacted you for any information
- 3 related to demand or consumptive use in the ACF
- 4 Basin?
- 5 **A. He hasn't, but let me -- let me say the**
- 6 **difference between the acreage and the linkage**
- 7 **between the acreage, the permit, and the water**
- 8 **use.**
- 9 **All right. So the two are not the same**
- 10 **issue. So to get the volume of water use, you**
- 11 **look at the irrigated or the wetted acreage**
- 12 **rather than a permitted amount. So in that**
- 13 **sense, certainly I know where the irrigated**
- 14 **acres are; and I do know their corresponding**
- 15 **water use. Now, whether or not that is a permit**
- 16 **issue, that's sort of beyond hydrology.**
- 17 **Q.** Understood, sir. And I'm certainly going to talk
- 18 about the areas that you're familiar with as well
- 19 as the areas that you're not familiar with; and
- 20 we'll get to that.

In fact, in the same paragraph that we were looking at, you highlight that you have had involvement in every key issue regarding hydrology, water resource management, and reservoir operations in the ACF Basin over the

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- 1 **Q.** Okay. I assume from that answer that you're not
- 2 on the task force?
- 3 **A. I'm certainly not on the task force.**
- 4 **Q.** Okay. On -- in paragraph 4 of your prefiled
- 5 direct testimony, which is behind tab 1, you
- 6 state that you believe no one has comparable
- 7 knowledge and experience regarding consumptive
- 8 use and water level -- water demand levels in the
- 9 ACF Basin. Do you see that, sir?
- 10 **A. I see that.**
- 11 **Q.** Does Governor Deal of Georgia know that?
- 12 **A. Know what?**
- 13 **Q.** That you believe that no one has comparable
- 14 knowledge and experience regarding consumptive
- 15 use and water demand levels in the ACF Basin.
- 16 **A. I'm -- I'm not sure if Governor Deal knows that.**
- 17 **But I'm --**
- 18 **Q.** Do you know --
- 19 **A. -- I'm sure Governor Deal knows that that**
- 20 **knowledge resides in the EPD, in the agency that**
- 21 **regulates water use.**
- 22 **Q.** Do you know anyone who is on the task force?
- 23 **A. I do know -- I did hear the name of Allen Barnes,**
- 24 **who was a prior EPD director.**
- 25 **Q.** Anyone else, sir?

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- 1 past decade. Is that correct?
- 2 **A. That's correct.**
- 3 **Q.** Okay. And I'm going to go over some of the
- 4 issues with you this morning.
- 5 On page 26 of your direct testimony you
- 6 explain that Georgia relies on unimpaired flows
- 7 for the UIF dataset prepared by the Army Corps.
- 8 Do you see that?
- 9 **A. I see that.**
- 10 **Q.** And in your testimony you further state that the
- 11 Corps uses and relies upon consumptive use data
- 12 from Georgia for the development of these UIF's;
- 13 is that correct?
- 14 **A. That's correct.**
- 15 **Q.** You state in paragraph 75 -- that's on page 27 --
- 16 that you have no recollection of instances in
- 17 which Florida questioned the, quote, technical
- 18 validity or reliability of Georgia's consumptive
- 19 use data until the current litigation began. Is
- 20 that correct?
- 21 **A. Well, I have no recollection of Florida's**
- 22 **technical people contacting me regarding the**
- 23 **technical validity of this data.**
- 24 **Q.** But you are aware that Florida, prior to the
- 25 commencement of this litigation, has challenged

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1 whether the consumptive use data proffered by
 2 Georgia is accurate. You know that?
 3 **A. I'm aware of a Florida legal counsel sending a**
 4 **letter to the Corps complaining about it, yes.**
 5 **I'm aware of that --**
 6 **Q.** Were you --
 7 **A. -- but I do not treat that legal counsel as a**
 8 **technical person.**
 9 **Q.** Are you also aware that the United States Fish
 10 and Wildlife Service has questioned the validity
 11 of the consumptive use data proffered by the
 12 State of Georgia? Are you aware of that?
 13 **A. I did come across the Service's criticism of the**
 14 **dataset.**
 15 **Q.** Are you also aware that the Georgia Water
 16 Resources Institute, or GWRI, has also questioned
 17 the validity and reliability of the EPD
 18 consumptive use dataset?
 19 **A. I don't think GWRI criticized the EPD water use**
 20 **data. They criticized the UIF. I'm aware of**
 21 **that.**
 22 **Q.** And we will certainly cover that in a little more
 23 detail, sir.
 24 Let's stay with consumptive use and talk
 25 about that in some more detail. In your direct

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1 testimony, you explain that the highest level or
 2 the peak level of consumptive use by Georgia on a
 3 monthly basis is slightly below 2,000. That's in
 4 paragraph 22 you have a graph. I think sometime
 5 in 2012 the amount of consumptive use is slightly
 6 above 1800 cfs. Is that -- does that seem right
 7 to you?
 8 **A. That's correct.**
 9 **Q.** And are you aware that the State of Florida's
 10 estimate of Georgia's consumptive use on a
 11 monthly basis is approximately 3800 cfs?
 12 **A. Well, I have come across a 3800 cfs. I wasn't**
 13 **sure if it was on a monthly basis.**
 14 **Q.** Let's talk about the various factors that make up
 15 your consumptive use estimate in your direct
 16 testimony.
 17 You're familiar with the fact, sir, that in
 18 the Georgia portion of the ACF Basin there are
 19 thousands of impoundments that store water for
 20 irrigation and other farm purposes?
 21 **A. I'm aware of that.**
 22 **Q.** And these impoundments are generally referred to
 23 as farm ponds?
 24 **A. Right.**
 25 **Q.** On page 22 of your direct testimony in paragraph

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1 60 you talk about surface-to-pond withdrawals,
 2 which refer to withdrawals for irrigation from
 3 these farm ponds. Is that right?
 4 **A. Well, yes. That's what I was saying there, is**
 5 **that kind of withdrawal is treated as part of**
 6 **surface water withdrawal.**
 7 **Q.** But your direct testimony does not discuss
 8 evaporation from these farm ponds; is that
 9 correct?
 10 **A. I did not.**
 11 **Q.** Okay. And are you aware that as of 2011, there
 12 were over 20,000 farm ponds in the Georgia
 13 portion of the ACF Basin?
 14 **A. Well, I came across a study sort of identifying**
 15 **the water bodies. I'm not sure all of them are**
 16 **farm ponds.**
 17 **Q.** Are you referring to the Ignatius and Stallins
 18 study, sir?
 19 **A. That's correct.**
 20 **Q.** This is the same study that's referenced by GWRI;
 21 is it not?
 22 **A. I think it was referenced by GWRI, yes.**
 23 **Q.** And let's put GWRI in some context. The Georgia
 24 Water Resources Institute is affiliated with
 25 Georgia Tech University?

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1 **A. That's correct.**
 2 **Q.** And EPD has contracted with GWRI in the past?
 3 **A. Occasionally, yes.**
 4 **Q.** Does it have any current contracts with GWRI?
 5 **A. I'm not aware of one at this moment. I had a**
 6 **couple with them before.**
 7 **Q.** And is the name Dr. Aris Georgakakos familiar to
 8 you?
 9 **A. Very.**
 10 **Q.** What about Dr. Martin Kistenmacher?
 11 **A. Yes.**
 12 **Q.** You're also very familiar with that individual?
 13 **A. Yes.**
 14 **Q.** What about Dr. C. J. Chen?
 15 **A. I'm not so familiar with him.**
 16 **Q.** Okay. But do you know that he was one of the
 17 individuals in addition to Dr. Kistenmacher and
 18 Dr. Georgakakos that prepared a UIF report in the
 19 fall of 2012?
 20 **A. I'm aware of the first two names, but not the**
 21 **third one.**
 22 **Q.** Okay. Could you please turn to tab 3 in the big
 23 binder. There you will see a document that's
 24 designated by FX-534. It's a report entitled
 25 Unimpaired Flow Assessment for the

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1 Apalachicola-Chattahoochee-Flint River Basin
 2 Draft Technical Report. Have you seen this
 3 before?
 4 **A. I have, yes.**
 5 **Q.** Okay. And if you turn to the second page, you
 6 will see a list of main authors and contributing
 7 authors. Do you see that?
 8 **A. I see that, yes.**
 9 **Q.** We have talked about Dr. Georgakakos. We have
 10 talked about Dr. Kistenmacher. Do you see
 11 Dr. C. J. Chen who is referred to in the
 12 contributing authors? Do you recognize any of
 13 the other names under contributing authors?
 14 **A. I know the first one. I know Dr. Yao.**
 15 **Q.** You know Dr. Yao?
 16 **A. Yes.**
 17 **Q.** Okay. Do you have respect for the work of these
 18 individuals?
 19 **A. Well, I have respect for these individuals as**
 20 **professionals.**
 21 **Q.** On the acknowledgments page, which is on the next
 22 page, III of FX-534, you will see that your name
 23 is mentioned there.
 24 **A. I see that.**
 25 **Q.** Okay. Did you receive this report in or about
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1 **A. I didn't give him a copy of this report. That's**
 2 **correct.**
 3 **Q.** I'm sorry. I missed that, sir. You did or did
 4 not?
 5 **A. I did not give him a copy of this report.**
 6 **Q.** Okay. Did you brief him on the report's
 7 contents?
 8 **A. I did not.**
 9 **Q.** Did you brief anyone at EPD about the contents of
 10 the report?
 11 **A. We have had discussion -- internal discussions on**
 12 **staff level about the criticism of the unimpaired**
 13 **flow. And I didn't, like, inform the director**
 14 **just on this issue; but in discussions we have**
 15 **had, certainly I let him know that there was this**
 16 **criticism of the unimpaired flow.**
 17 **Q.** Okay. Did you tell him that there was a
 18 criticism relating to the failure to account for
 19 evaporation from farm ponds?
 20 **A. I'm aware of that issue; but I did not -- I don't**
 21 **recall specifically telling him that.**
 22 **Q.** Do you recall discussing that issue with staff?
 23 **A. I do, yes.**
 24 **Q.** Okay. Which staff members did you discuss that
 25 with?
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1 November of 2012?
 2 **A. I did.**
 3 **Q.** Okay. In fact, you participated in workshops
 4 before this report was issued; isn't that right?
 5 **A. Well, I'm not sure the workshop was specifically**
 6 **for this purpose. We had meetings. We had**
 7 **regular meetings with the GWRI; and I cooperated**
 8 **fully with their study, provided data that we**
 9 **developed. So I'm not sure if there is a -- you**
 10 **know, one specific workshop that you referred to.**
 11 **Q.** September 10, 2012, Columbus, Georgia, at the
 12 Columbus Convention Center, do you remember going
 13 there?
 14 **A. September 2012?**
 15 **Q.** September 10 of 2012, yes, sir.
 16 **A. I don't recall that meeting.**
 17 **Q.** Okay. Let's go back to your providing
 18 information to the authors of this report. What
 19 kind of information did you provide?
 20 **A. Consumptive use.**
 21 **Q.** Okay. And that includes M & I as well as
 22 agricultural consumptive use?
 23 **A. That is correct.**
 24 **Q.** On Friday Director Turner testified that you
 25 never gave him a copy of this report.
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1 **A. Well, I believe it was -- it was a staff meeting**
 2 **that I had. So it would be every member of my**
 3 **unit.**
 4 **Q.** Okay. And approximately how many members are in
 5 the unit?
 6 **A. I have six staff members in my unit.**
 7 **Q.** And did that discussion occur after you received
 8 a final copy of this report or prior to that
 9 time?
 10 **A. Well, the discussion about evaporation from open**
 11 **water surface bodies has been long. So I would**
 12 **say just on evaporation itself, it's probably**
 13 **both before and after. Certainly, you know, when**
 14 **we received this, I would have talked with my**
 15 **staff member on the farm pond evaporation alluded**
 16 **to in this report.**
 17 **Q.** Okay. Well, let's look to where they're alluded
 18 to. Can you please turn to page 191 of FX-534,
 19 sir. And I'll request that you please read the
 20 section at the bottom of the page to yourself
 21 entitled Net Evaporation Losses From Other Basin
 22 Impoundments.
 23 **A. Hold on. Did you say 194?**
 24 **Q.** I'm sorry. 191.
 25 **A. 191.**
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- 1 **Q.** It's the section at the bottom of the page
- 2 entitled Net Evaporation Losses From Other Basin
- 3 Impoundments.
- 4 **A. I see that.**
- 5 **Q.** Okay. Sir, were you aware in the fall of 2012
- 6 that GWRI had concluded that net evaporation from
- 7 farm ponds could result in an up to 1200 cfs net
- 8 loss? Did you know that?
- 9 **A. I'm aware of the number.**
- 10 **Q.** Okay. And I believe you said earlier that the
- 11 consumptive use information that you presented to
- 12 the Supreme Court contains no number associated
- 13 with evaporative loss from farm ponds; is that
- 14 correct?
- 15 **A. That's correct.**
- 16 **Q.** Okay. Let's move to another category of
- 17 information that's not in your prefiled direct.
- 18 Your consumptive use data for agricultural
- 19 irrigation does not include any amount for
- 20 groundwater pumping from aquifers other than the
- 21 non-Floridan -- I'm sorry -- the non-Upper
- 22 Floridan Aquifers. Do you include those or do
- 23 you not include those?
- 24 **A. Could you repeat the question --**
- 25 **Q.** Sure.

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- 1 **A. That's correct.**
- 2 **Q.** So both in footnote 1 and in paragraph 61, you
- 3 say that the impact from these aquifers on
- 4 streamflow is not zero, but it's minimal; is that
- 5 right?
- 6 **A. It's very small. It's close to zero.**
- 7 **Q.** Okay. And, therefore, you treat it as zero in
- 8 your direct testimony?
- 9 **A. That's correct.**
- 10 **Q.** Do you know a fellow by the name of Dr. James
- 11 Kennedy?
- 12 **A. Yes.**
- 13 **Q.** And who is Dr. Kennedy?
- 14 **A. He is the state geologist.**
- 15 **Q.** And does the state geologist study groundwater?
- 16 **A. He does.**
- 17 **Q.** Can you please turn with me, sir, to tab 4. It
- 18 says FX-63, and it's a memo prepared by
- 19 Dr. Kennedy. And I would like to direct you in
- 20 particular to page 27 of the memo from the state
- 21 geologist.
- 22 **A. Yes.**
- 23 **Q.** And the very last paragraph, if you might read
- 24 that to yourself, sir.
- 25 **A. I see that.**

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- 1 **A. -- because I think I -- could you repeat the**
- 2 **question, please?**
- 3 **Q.** Certainly. Consumptive use data that you present
- 4 for agricultural irrigation, does it include any
- 5 values associated with groundwater pumping from
- 6 aquifers other than the Floridan Aquifer?
- 7 **A. Right. The agricultural consumptive use that we**
- 8 **have incorporated does not incorporate pumping**
- 9 **data from the aquifers other than the Floridan**
- 10 **Aquifer because those aquifers are not**
- 11 **hydrologically connected with the streams.**
- 12 **Q.** Sir, in footnote 1 of your prefiled direct that's
- 13 on page 1 -- do you have it in front of you?
- 14 **A. Yes.**
- 15 **Q.** Okay. You write that groundwater withdrawals
- 16 from deep unconnected aquifers have minimal, if
- 17 any, impact on surface water flows.
- 18 And is that the reason you exclude it?
- 19 **A. That's correct.**
- 20 **Q.** Okay. You go on to say in paragraph 61 on page
- 21 22 that water withdrawals from non-UFA, which I
- 22 assume means non-Upper Floridan, deeper aquifers,
- 23 for example, Claiborne, Clayton, Cretaceous, have
- 24 limited to no hydraulic connection with surface
- 25 water streams in the ACF Basin. Is that correct?

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- 1 **Q.** Okay. Do you agree with Dr. Kennedy's conclusion
- 2 that pumping from the Claiborne Aquifer would
- 3 result in some impact to streamflow?
- 4 **A. I disagree.**
- 5 **Q.** You -- and have you informed Dr. Kennedy of your
- 6 disagreement?
- 7 **A. Well, we disagreed over many issues, so he's**
- 8 **aware of that.**
- 9 **Q.** Okay. And you don't mention this disagreement in
- 10 your direct testimony; do you?
- 11 **A. I did not.**
- 12 **Q.** And you state in your direct testimony that your
- 13 consumptive use estimates are conservative?
- 14 **A. Yes.**
- 15 **Q.** And in your opinion, treating withdrawals from
- 16 the Claiborne and the Clayton and the Cretaceous
- 17 Aquifers as zero is conservative?
- 18 **A. That's correct.**
- 19 **Q.** Okay. In fact, on page 18 of your testimony, you
- 20 highlight that there's more than 154,000 acres
- 21 irrigated from non-Upper Floridan Aquifers; and
- 22 you believe that it's conservative to treat the
- 23 surface water impact of these withdrawals as
- 24 zero?
- 25 **A. Well, yes. It's simply because they are not**

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1 **connected.**

2 **Q.** Let's talk about, now, your estimates of

3 irrigated acreage. In the last sentence of

4 paragraph 46 of your direct testimony, sir --

5 this is on page 16 --

6 **A. Did you say 46?**

7 **Q.** I said 46 of your direct testimony on page 16.

8 **A. Yes.**

9 **Q.** And in the very last sentence of paragraph 46,

10 you say that in the early 2000's Georgia was

11 making, quote, educated guesses, end quote, about

12 agricultural consumptive use. Is that right?

13 **A. I'm trying to get to the very place. Could you**

14 **direct me to the place, please?**

15 **Q.** Certainly, sir. It's paragraph 46 that starts on

16 page 16, and it continues onto the following

17 page.

18 **A. Sorry. My 46 starts from page 15.**

19 **Q.** I apologize. If you read paragraph 46 on page 15

20 and read it all the way to the end of the

21 paragraph, there is a sentence that begins, in

22 fact, I would describe.

23 **A. I've got it.**

24 **Q.** Okay. So is it fair to say that in the early

25 2000's Georgia was making, quote, educated

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1 guesses, end quote, about agricultural

2 consumptive use?

3 **A. Well, it wasn't just the State of Georgia. It**

4 **was at the time with the consumptive -- with the**

5 **comprehensive study and under the ACF Compact.**

6 **And so the study -- so the understanding of Ag**

7 **water use at the time was the -- was under the**

8 **Compact. And it was under the comprehensive**

9 **study, which means it was a consensus by the**

10 **States and the federal government. So that was**

11 **the way to estimate Ag water use. And I was**

12 **describing that as an educated guess.**

13 **Q.** But you're submitting this direct testimony on

14 behalf of the State of Georgia. Right?

15 **A. That's correct.**

16 **Q.** And so when you say our understanding, whose

17 understanding are you referring to?

18 **A. Well, I was referring to -- certainly, I was**

19 **referring to the State of Georgia's**

20 **understanding. But I just wanted to make sure**

21 **that it was also the understanding of the other**

22 **parties.**

23 **Q.** The other parties understood that Georgia was

24 making educated guesses?

25 **A. It was a collective understanding.**

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1 **Q.** Okay. And then you go on to say in the following

2 paragraphs, in particular on paragraph 54, that a

3 2003 study by Dr. James Hook at the University of

4 Georgia was published. And it was the

5 publication of that study that provided Georgia

6 with sufficient information to make more reliable

7 estimates. Is that true?

8 **A. That's correct.**

9 **Q.** Okay. But, sir, isn't it true that even after

10 that study was published and relied on by Georgia

11 EPD, the State continued to make significantly

12 higher estimates of agricultural water usage and

13 irrigated acreage than what you have in your

14 direct testimony?

15 **A. I'm not understanding your question. Sorry.**

16 **Q.** After Dr. Hook published his study in 2003, after

17 Georgia EPD relied on that study, it continued to

18 make estimates of irrigated acreage that are

19 significantly higher than the numbers you

20 presented to this Court. Isn't that right?

21 **A. I don't think that's right.**

22 **Q.** All right. Can you please turn to tab 5, sir.

23 Tab 5 is an April 2003 letter marked FX-219. And

24 it's written by Mr. Harold Reheis attaching a

25 memorandum.

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1 You know Mr. Reheis; don't you?

2 **A. Yes.**

3 **Q.** He was the director of EPD at this point in time,

4 April 2003?

5 **A. Yes.**

6 **Q.** Okay, sir. If you to turn to page 9 of the

7 attached memo --

8 **A. Yes.**

9 **Q.** -- may I request that you take a moment to read

10 the last two paragraphs on that page.

11 **A. I see the paragraphs.**

12 **Q.** Okay. And in the paragraph there's a reference

13 to the UGA Water Pumping Study. That is the 2003

14 study by Dr. Hook; isn't that right?

15 **A. I think so, yes.**

16 **Q.** Okay. And relying on that very same study,

17 Director Reheis estimates irrigation acreage of

18 more than 920,000; doesn't he?

19 **A. Well, I think we need to -- I know where we're**

20 **going with this; but I think we need to make a**

21 **distinction between the Ag study -- the UGA Ag**

22 **Water Pumping Study and the mapping effort.**

23 **These are two different efforts.**

24 **Q.** I understand, sir. My question was a little more

25 straightforward. In this communication to other

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1 members of the ACF Compact, Director Reheis
 2 estimates irrigation acreage of more than
 3 920,000; is that right?
 4 **A. Well, that was right. But that was before the**
 5 **mapping of -- or the result of the mapping came**
 6 **out.**
 7 **Q.** And the results of the mapping and the result of
 8 your work here is a significantly lower amount of
 9 irrigated acreage as represented on page 18 of
 10 your direct testimony?
 11 **A. Well, that is a significantly more accurate**
 12 **capturing of the irrigated acreage.**
 13 **Q.** Let's stay with this topic of irrigated acreage,
 14 but I want to go to a slightly different subject.
 15 And that subject is the term throw acres. Do you
 16 know what throw acres means?
 17 **A. Yes.**
 18 **Q.** What does it mean?
 19 **A. Well, it means at the end of a center-pivot**
 20 **irrigation equipment, there is sometimes attached**
 21 **a -- what's called an end-gun. And so the**
 22 **end-gun can throw water out beyond the range of**
 23 **the irrigation equipment so that a bigger area**
 24 **can be irrigated.**
 25 **Q.** And the area in the range of the irrigation

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1 equipment, are those referred to as hardware
 2 acres?
 3 **A. That is correct.**
 4 **Q.** And generally throw acres are a larger area than
 5 hardware acres; is that correct?
 6 **A. Slightly, yes.**
 7 **Q.** Okay. I'm sorry. You said slightly?
 8 **A. Yes.**
 9 **Q.** And you used Georgia's wetted acreage database
 10 that's at JX-129 to calculate the total number of
 11 hardware acres; is that correct?
 12 **A. That's correct.**
 13 **Q.** Okay. And, in fact, the numbers you have on
 14 page 18 of your direct testimony, those are just
 15 hardware acres; isn't that right?
 16 **A. In -- I think you're referring to demonstrative 7?**
 17 **Q.** That's correct, page 18.
 18 **A. Right.**
 19 **Q.** And the number in particular that I'm focused on
 20 is the 723,127. And my question, sir, is those
 21 are just hardware acres?
 22 **A. Well, let me make a clarification. All right.**
 23 **So the acreage that we used here, do you see the**
 24 **first two rows?**
 25 **The first two rows that are associated with**

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1 **years 2004 and 2009, those are the throw acres.**
 2 **Those were provided directly from Dr. Jim Hook's**
 3 **study. So those reflect the throw acreage. And**
 4 **then the last three rows here, they were**
 5 **developed or they were mapped associated with the**
 6 **Ag metering program. So those acreage were**
 7 **hardware acreage.**
 8 **Q.** So --
 9 **A. And there is a slight difference there.**
 10 **Q.** I apologize for interrupting you, sir.
 11 My question, again, was the 723,127, the cell
 12 on the extreme right-hand corner, that's just
 13 hardware acres. Isn't that right?
 14 **A. That's hardware acres, yes.**
 15 **Q.** Okay. And if you were to add 2014 throw acres,
 16 do you know what the number would increase to?
 17 **A. I don't know.**
 18 **Q.** Okay. And I believe you testified it would be a
 19 slight increase?
 20 **A. Yes.**
 21 **Q.** All right. Well, we used the wetted acreage --
 22 wetted acreage database JX-129 to evaluate
 23 whether or not it was a slight difference. And
 24 if I may request that you turn to tab A in the
 25 demonstrative booklet.

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1 **A. Yes.**
 2 **Q.** You will see that the number is 826,877. Do you
 3 see that?
 4 **A. Tab 8?**
 5 **Q.** Tab A. A as in Abid.
 6 **A. Tab A. I'm sorry.**
 7 **Q.** Tab A in the small booklet, sir.
 8 **A. Oh, I'm sorry. Okay. I see that.**
 9 **Q.** Okay. You hadn't done this analysis; had you?
 10 **A. Well, no. But let me -- let me clarify on the**
 11 **acreage and the use of the acreage, all right.**
 12 **So the acreage or the irrigated acreage is used**
 13 **in such a way that you would use the acreage that**
 14 **is associated with Ag metering volume to develop**
 15 **irrigation depth. And then you would apply the**
 16 **irrigation depth to the overall acreage. Right?**
 17 **Are you with me here?**
 18 **So -- so to develop the application depth,**
 19 **you need to have a set of irrigated acreage,**
 20 **whether or not that's throw acres or that's**
 21 **hardware acreage. And then when you do the**
 22 **extrapolation -- because you don't have every**
 23 **system metered, right, so you have a big sample**
 24 **of all of the meters -- of all of the irrigation**
 25 **equipment meters. And then you would go -- use**

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1 **that rate to apply it to the ones that are not**
 2 **metered. So for that purpose, you need to have a**
 3 **consistency between the acreage you use to**
 4 **develop the application depth and the total**
 5 **acreage that you apply.**
 6 **So I could use -- I could use the hardware**
 7 **acreage to develop the depth and then apply it to**
 8 **the overall hardware acreage for the total volume**
 9 **of water. Or I could use the throw acreage to**
 10 **develop the application depth, which would be**
 11 **lower because the acreage now is larger. But**
 12 **then when I apply it to the overall acreage, that**
 13 **is also larger, which means if you used a**
 14 **consistent methodology, the total volume of water**
 15 **that you derive would be the same.**
 16 **Q.** Sir, you had access to the wetted acreage
 17 database?
 18 **A. Yes.**
 19 **Q.** And you had access to the total number of throw
 20 acres that were listed in that database. Is that
 21 right?
 22 **A. I'm not sure about that. I think -- I think the**
 23 **answer is probably yes.**
 24 **Q.** Okay. Well, that's -- I'll represent to you
 25 that's where we got the number from.

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1 **A. Okay.**
 2 **Q.** I would like to now return to the claim that you
 3 make in paragraph 75 of your direct testimony,
 4 indicating that you have no recollection of
 5 instances in which Florida questioned the
 6 technical validity or reliability of Georgia's
 7 consumptive use data. And I believe you
 8 testified that you saw letters from Florida's
 9 lawyers criticizing the consumptive use data, but
 10 not from technical experts. Is that your
 11 testimony, sir?
 12 **A. Right. I have not -- I have not heard from**
 13 **any -- any member of the technical team from the**
 14 **State of Florida complaining about the --**
 15 **complaining about the quality of Georgia's water**
 16 **use data.**
 17 **Q.** But you do agree that prior to the start of the
 18 litigation, Florida was complaining about the
 19 quality of the consumptive use data provided by
 20 Georgia?
 21 **A. I'm aware of that legal counsel's letter.**
 22 **Q.** Okay. And the letter you're talking about, sir,
 23 is that behind tab 6 at FX-909?
 24 I'll represent to you this is a January 7,
 25 2007, letter from the Florida Department of

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1 Environmental Protection.
 2 **A. Did you say tab 6?**
 3 **Q.** Yes, sir. And it's printed a little oddly, so
 4 you have to turn it sideways. But if you turn to
 5 page 14, the last paragraph on page 14, I would
 6 invite you to read that.
 7 **A. I see that.**
 8 **Q.** Okay. And is this the letter you were referring
 9 to by the counsel for Florida Department of
 10 Environmental Protection?
 11 **A. I'm not sure about that. I'm not sure whether**
 12 **this is the letter. But I -- I have come across**
 13 **a letter of this nature.**
 14 **Q.** Okay. And you don't consider it a technical
 15 criticism; is that right?
 16 **A. Well, I think the letter sent was sent from a**
 17 **legal counsel.**
 18 **Q.** Okay. And my question was you don't, therefore,
 19 think of it as a technical criticism?
 20 **A. Well, it wasn't made by a technical person.**
 21 **Q.** And, again, if it's not made by a technical
 22 person -- let me back up.
 23 You believe a lawyer is not a technical
 24 person?
 25 **A. Well, I believe a lawyer is not a technical**

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1 **person, not in our field.**
 2 **Q.** Okay. And, therefore, the letter from the lawyer
 3 is not valid to you?
 4 **A. That's not what I'm saying. What I'm saying is**
 5 **there is a general way of communicating technical**
 6 **information. It used to be the technical people**
 7 **in the basin are very open to exchanging ideas**
 8 **and views among the technical people. So there**
 9 **was open discussion about issues related, all the**
 10 **technical -- the technical elements of the entire**
 11 **basin. So this certainly is not a -- an exchange**
 12 **of that nature.**
 13 **Q.** You went to a meeting in Eufaula, Alabama, in
 14 November of 2012?
 15 **A. That's correct.**
 16 **Q.** And there were technical personnel from the State
 17 of Florida present there; weren't they?
 18 **A. Yes.**
 19 **Q.** And in that meeting, they criticized the
 20 consumptive use data presented by the State of
 21 Georgia?
 22 **A. I don't recall that.**
 23 **Q.** But you were at that meeting?
 24 **A. I was at that meeting.**
 25 **Q.** Do you remember a presentation by a Ms. Helen

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1 Light?

2 **A. Yes.**

3 **Q.** Do you consider her a technical person?

4 **A. She is.**

5 **Q.** And so you don't recall her criticizing Georgia's

6 consumptive use data?

7 **A. I don't.**

8 **Q.** Okay. Let's turn to tab 7. This is another

9 letter from Florida's Department of Environmental

10 Protection. Do you recall reviewing this letter,

11 sir?

12 This is JX-152. And on page 9 of this

13 letter, there's another criticism of Georgia's

14 consumptive use data. In particular, sir, on

15 page 9 it's the second paragraph that begins,

16 Florida is aware.

17 **A. I see this.**

18 **Q.** Okay. Do you recall receiving this letter, sir?

19 **A. I do, yes.**

20 **Q.** Okay. And you were aware of it when you prepared

21 your prefiled direct testimony?

22 **A. Yes.**

23 **Q.** And that letter predates the litigation in this

24 matter, or the filing of the complaint in this

25 matter?

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1 **A. Yes.**

2 **Q.** Let's look at tab 8, sir. It's a document

3 designated at FX-778. I would request that you

4 look at pages 3 and 4. And in particular, the

5 numbered paragraphs 1, 2 --

6 **A. I'm sorry. The -- sorry for interrupting; but I**

7 **don't have a page number here.**

8 **Q.** Yes. There's no --

9 **A. Oh, I got it.**

10 **Q.** Did you find it?

11 **A. Yes.**

12 **Q.** Okay. So I would like you to please review to

13 yourself paragraphs 1, 2, 4, 5, and 6.

14 **A. I see that.**

15 **Q.** Okay. Do you recall receiving this letter?

16 **A. I don't recall receiving this letter.**

17 **Q.** Okay. You don't recall reviewing it prior to

18 submitting your prefiled direct testimony?

19 **A. I don't. Sorry.**

20 **Q.** I'll give you a moment to get some water.

21 **A. All right. Thanks.**

22 **Q.** Can we please turn to tab 9, sir. This is a

23 letter from the United States Department of

24 Interior Fish and Wildlife Service to Mr. Brad

25 Moore of the ACF Stakeholders. Do you know

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1 Mr. Moore?

2 **A. Yes.**

3 **Q.** Okay. Who is he?

4 **A. He's a member -- he's a leader of the ACF**

5 **Stakeholder Group.**

6 **Q.** Okay. Does he have any position with the State

7 of Georgia?

8 **A. I don't think he has.**

9 **Q.** Okay. Have you seen this document before, sir?

10 **A. I don't believe so.**

11 **Q.** Okay. On the first page there's a criticism of

12 the Corps unimpaired flow dataset, the UIF. Do

13 you see that?

14 **A. I see that.**

15 **Q.** Were you aware of this criticism by the United

16 States Fish and Wildlife Service prior to today?

17 **A. I'm aware of the Service's criticism in general,**

18 **but I don't specifically recall this letter.**

19 **Q.** And were you aware of the Fish and Wildlife

20 Service's criticism in general before you

21 submitted your prefiled direct testimony in this

22 case?

23 **A. Well, I know there are criticisms in general,**

24 **yes.**

25 **Q.** Okay.

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1 **A. But it was a criticism of the unimpaired flow,**

2 **not Georgia's water use.**

3 **Q.** And does Georgia's consumptive demand information

4 play a part in the unimpaired flow -- the UIF's?

5 **A. It certainly does.**

6 **Q.** Okay. And you will see on the bottom of page 1

7 of the letter, there is a suggestion that the

8 unimpaired flow data are underestimated during

9 wet years after 1994. Were you aware of that

10 criticism before filing your prefiled direct,

11 sir?

12 **A. Can you point me to the sentence?**

13 **Q.** Certainly. It's at the bottom of the first page,

14 and it begins with the sentence, additionally, we

15 have evidence that the demand data used. Were

16 you able to locate it, sir?

17 **A. Yes. So -- so this is saying that the service**

18 **believes that demand data used in the unimpaired**

19 **flow are underestimated during wet years.**

20 **Q.** And my question was were you aware of this

21 criticism before submitting your direct testimony

22 in this matter?

23 **A. I'm not aware of this specific one.**

24 **Q.** Okay. Now, I would like to return to a document

25 we talked about a little bit earlier today.

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1 That's behind tab 3. That's the UIF report by
 2 GWRI.
 3 **A. Yes.**
 4 **Q.** Okay. Can I please direct you to the executive
 5 summary, which is on the fourth page, and ask you
 6 to read the section that begins, the assessment
 7 demonstrates, the fourth paragraph.
 8 **A. Yes. Just the fourth paragraph?**
 9 **Q.** Yes. Just the fourth paragraph.
 10 **A. I read it.**
 11 **Q.** Okay. Were you aware of this criticism of the
 12 UIF dataset that builds on EPD's consumptive use
 13 data when you filed your prefiled direct
 14 testimony?
 15 **A. I was aware of this criticism; but this criticism**
 16 **was not --- this criticism was not on the EPD**
 17 **data. It was criticism on the process, the**
 18 **entire process.**
 19 **Q.** So let's go to page 191. And before I direct you
 20 to a particular section, is Dr. Georgakakos a
 21 technical person in your view?
 22 **A. He certainly is.**
 23 **Q.** And Dr. Kistenmacher, is he a technical person in
 24 your estimation?
 25 **A. He is.**

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1 **director.**
 2 **Q.** Okay.
 3 **A. It's a technical issue.**
 4 **Q.** You failed to raise it with Director Turner
 5 because you viewed it as a technical issue?
 6 **A. It is a technical issue that I can address. I**
 7 **can address with my staff. I can address with my**
 8 **partners in the Corps. And so I did not raise**
 9 **this to the director. And if you want to know**
 10 **why, I can explain.**
 11 **Q.** I actually think I know why. We'll get to that
 12 later.
 13 Sir, I would like to move to another topic
 14 now, if we might; and that is the Flint River
 15 Drought Protection Act. Are you familiar with
 16 that statute?
 17 **A. Well, reasonably, yes.**
 18 **Q.** Okay. And the hydrology unit, you and your
 19 colleagues, you do play some role in EPD's
 20 decision as to whether or not to invoke the Act?
 21 **A. We inform the director, yes.**
 22 **Q.** And one of the tools that you and your colleagues
 23 use, at least for -- you did for a particular
 24 period of time, was the Flint River Drought
 25 Declaration Matrix?

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1 **Q.** Okay. Can you please look to the section on
 2 agricultural withdrawals in the middle of the
 3 page.
 4 **A. Yes.**
 5 **Q.** Okay. I'll give you a moment to read that to
 6 yourself.
 7 **A. I read it.**
 8 **Q.** Okay. Sir, were you aware of this criticism by
 9 Dr. Georgakakos and Dr. Kistenmacher regarding
 10 EPD's estimation procedures?
 11 **A. I'm aware of that, yes.**
 12 **Q.** And were you aware of this before you submitted
 13 your testimony in this matter?
 14 **A. I'm aware of this before I submitted my**
 15 **testimony.**
 16 **Q.** And did --
 17 **A. That's correct.**
 18 **Q.** Sorry to interrupt you.
 19 **A. That's all right.**
 20 **Q.** And did you raise this issue with Director
 21 Turner?
 22 **A. I had internal discussion with my staff, so I**
 23 **have reviewed the document. I have an**
 24 **understanding. And I happen to disagree over**
 25 **that, and so I did not raise this issue with the**

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1 **A. It's a matrix. I'm not sure it has that formal**
 2 **name, but I think I know what you're referring**
 3 **to.**
 4 **Q.** All right. So we'll just call it the matrix.
 5 And that matrix was developed together with the
 6 United States Geological Survey?
 7 **A. That's correct.**
 8 **Q.** And the Act, the Flint River Drought Protection
 9 Act, it requires the EPD director to make a
 10 determination by March 1 of every year as to
 11 whether or not to invoke the statute?
 12 **A. That's correct.**
 13 **Q.** Sir, may I request that you turn to tab 11.
 14 **A. Yes.**
 15 **Q.** I'll give you a moment to review FX-78, which is
 16 a January 24, 2011, memorandum prepared by
 17 yourself and Inchul Kim, I N C H U L.
 18 Focus on the Recommendation section which is
 19 at the bottom of page 2 and the top of page 3.
 20 May I request that you read that to yourself,
 21 sir.
 22 **A. I know what it says.**
 23 **Q.** Okay. And when you prepared this memorandum and
 24 that recommendation, did you believe it was
 25 accurate at the time?

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1 **A. First of all, I have to say it's not a**
 2 **recommendation.**
 3 **Q.** When you prepared the text in the section
 4 underneath Recommendation, did you believe that
 5 text to be accurate?
 6 **A. I wrote that text.**
 7 **Q.** Did you believe it was accurate, sir, at the time
 8 you wrote it?
 9 **A. It reflects my -- it accurately reflects my**
 10 **understanding of the situation at the time.**
 11 **Q.** Thank you.
 12 **A. But it was not a recommendation.**
 13 **Q.** Okay. And my question again was the text itself,
 14 call it whatever you want, it was accurate?
 15 **A. The text accurately reflects my understanding at**
 16 **the time, yes.**
 17 **Q.** Okay. I would now like to turn to the next tab,
 18 tab 12. And that's a document marked FX-912.
 19 And it's an e-mail between you and a gentleman
 20 named Mr. Cliff Lewis. Do you know Mr. Lewis?
 21 **A. Yes.**
 22 **Q.** Okay. Did you send him the e-mail at the bottom
 23 of the page?
 24 **A. It looks like that was an e-mail from me.**
 25 **Q.** Okay. And in this e-mail, were you assessing the
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1 flow benefits and the financial cost of invoking
 2 the Act?
 3 **A. I think I was -- I think I was conveying the**
 4 **message mostly on the potential flow benefit**
 5 **rather than cost because cost usually is not a**
 6 **part of hydrology.**
 7 **Q.** Okay. So you were calculating the flow benefits
 8 of invoking the Act in January of 2011?
 9 **A. That seems to be the case.**
 10 **Q.** And at the top of the document, FX-912, Mr. Lewis
 11 responds to you and someone named Tim. Do you
 12 know who that refers to?
 13 **A. That would be Tim Cash, the assistant branch**
 14 **chief for the basin at the time.**
 15 **Q.** And he writes, based on your accounts, estimated
 16 cost for FRDPA is 31,355,600. Do you have any
 17 understanding as to why he was providing you that
 18 cost information if hydrology doesn't involve
 19 costs?
 20 **A. I'm not sure why he was copying me on that.**
 21 **Q.** Okay. When you wrote the e-mail to Mr. Lewis,
 22 did you believe the information you provided him
 23 was accurate?
 24 **A. Yes.**
 25 **Q.** And in 2011, the director of EPD was Director
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1 Allen Barnes?
 2 **A. That's correct.**
 3 **Q.** And Director Barnes did not invoke the Flint
 4 River Drought Protection Act in 2011; did he?
 5 **A. He did not.**
 6 **Q.** Okay. I would like to move a little further in
 7 time in 2011, sir, if you might. If you could
 8 please turn to tab 13, it's a memo designated as
 9 FX-82. It appears to be from you to Director
 10 Barnes on September 6, 2011.
 11 **A. Yes.**
 12 **Q.** Did you prepare this memo, sir?
 13 **A. Yes.**
 14 **Q.** I want to focus on the two numbered items on the
 15 first page of J -- the first page of FX-82.
 16 **A. First page, yes.**
 17 **Q.** The two numbered paragraphs. I'll give you a
 18 moment to review those to yourself.
 19 **A. I read them.**
 20 **Q.** Okay. At the end of the paragraph marked 1 you
 21 write, quote, the lack of groundwater recovery in
 22 this year was stunning, end quote.
 23 At the time you made that observation, sir,
 24 did you believe it was accurate?
 25 **A. It was accurate, yes.**
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1 **Q.** Okay. On the following page you make some
 2 observations about streamflow in the Flint River.
 3 Can you please take a moment to read those to
 4 yourself.
 5 **A. I read it.**
 6 **Q.** Okay. Sir, when you made these observations
 7 about the impact of low groundwater level and
 8 discharge on streamflow, did you believe them to
 9 be accurate?
 10 **A. Yes.**
 11 **Q.** Finally, I would like to direct you to the
 12 section on projections of potential future
 13 conditions and, in particular, the middle
 14 paragraph in that section.
 15 **A. I'm sorry, where is that?**
 16 **Oh, the last section?**
 17 **Q.** The last section and the middle paragraph, the
 18 one that begins, if this comes to fruition.
 19 **A. I see that.**
 20 **Q.** Okay. And at the time you wrote this, did you
 21 believe it to be accurate, sir?
 22 **A. It was accurate.**
 23 **Q.** Okay. And although it's a memo written by a
 24 hydrologist, it does refer to economic activity;
 25 doesn't it?
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1 **A. Yes.**

2 **Q.** Okay. Let's move on to 2012, sir. You were

3 involved in the drought determination process in

4 early 2012?

5 **A. Yes.**

6 **Q.** And as part of your work, you examined whether

7 the application of the drought matrix would

8 suggest a severe drought?

9 **A. Yes.**

10 **Q.** And your application of the matrix produced a

11 forecast of probable severe drought in the summer

12 of 2012; is that correct?

13 **A. By the matrix criteria, yes.**

14 **Q.** I'm sorry. I didn't hear you.

15 **A. By the criteria that would be applied to the**

16 **matrix, yes.**

17 **Q.** Okay. May I please direct you to tab 14, the

18 document labeled FX-83.

19 **A. I'm there.**

20 **Q.** Was this memorandum prepared by you and Inchul

21 Kim, I N C H U L?

22 **A. Yes. But there is one clarification I would like**

23 **to provide the Court.**

24 **Q.** Certainly.

25 **A. You referred to -- I think you -- this is the**
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1 **second time you referred to a memorandum that was**

2 **written by me in January of a year rather than in**

3 **February of a year. So there's a difference**

4 **between the January one and the February one.**

5 **All right?**

6 **Q.** So if I -- I'm sorry to interrupt you. If I said

7 February for this, I apologize. It says January,

8 and that's what I meant to say.

9 **A. Well, I was providing that clarification between**

10 **the January version and the February version.**

11 **The February version is the version that has the**

12 **right information by the matrix.**

13 **Now, the January version is only a pre-run.**

14 **It's a dry run that my staff and I have to gear**

15 **up toward the February evaluation. So the**

16 **information provided in the January evaluation is**

17 **using data one month ahead of the actual data**

18 **that should be used. So you shouldn't treat the**

19 **January -- the January draft memorandum as the**

20 **recommendation or any anything of any official**

21 **capacity.**

22 **Q.** Certainly I understand that, sir; and I don't

23 intend to treat it as anything other than what it

24 is. And we'll walk through all of it, the memos

25 and the iterations and the changes. But I
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1 appreciate the clarification.

2 In this document, FX-83, on page 2 and 3

3 there is a section entitled Recommendation. And

4 then there's text underneath that. At the time

5 you prepared that text, did you believe it to be

6 true and accurate?

7 **A. Again, this is the January memo.**

8 **Yes, when I wrote it, I believed the**

9 **information was accurate.**

10 **Q.** And did you send the memo to anybody?

11 **A. The January memo? Probably not.**

12 **Q.** So your answer is probably not?

13 **A. I think probably not because this was -- like I**

14 **said, this was a preparation for myself and my**

15 **staff toward the February memorandum. So I don't**

16 **think there was a reason for me to communicate --**

17 **well, for me to send this memo to anybody except**

18 **in the draft format, in the discussion format.**

19 **Q.** I completely understand, sir. So we won't treat

20 the January memo behind tab 14, FX-83, as final

21 because it's the January version. We'll look at

22 the February version.

23 **A. Okay.**

24 **Q.** Please turn to tab 15. This is a memorandum

25 labeled FX-89 dated February 16, 2012. Do you
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1 see that, sir?

2 **A. I see that.**

3 **Q.** And was this prepared by you and Inchul Kim?

4 **A. That's correct.**

5 **Q.** Okay. Let's turn to the second and third pages

6 in a section entitled Recommendation. And I will

7 request that you please read the text underneath.

8 **A. I see that.**

9 **Q.** Okay. And at the time you wrote this, was it

10 true and accurate?

11 **A. It was accurate.**

12 **Q.** Including the information in the very last

13 paragraph, was it true and accurate at the time

14 you wrote it?

15 **A. Well, the information was accurate as we**

16 **presented the information. But I had doubts over**

17 **the accuracy of the predictive capability of the**

18 **information.**

19 **Q.** Okay. I'm going to try my question again because

20 I don't think you answered it.

21 At the time you wrote this memo, the last

22 paragraph, was it true and accurate?

23 **A. It was accurate.**

24 **Q.** Okay. Sir, can we please turn to the next tab.

25 This is a document which bears the same date,
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1 February 16, 2012. And this is designated as
 2 JX-70. Did you prepare this memo, sir?
 3 **A. Yes.**
 4 **Q.** And did you prepare it with your colleague Inchul
 5 Kim?
 6 **A. That's correct.**
 7 **Q.** Okay. And now if you turn to pages 2 or 3,
 8 there's no section that says Recommendation; is
 9 there?
 10 **A. There is none, yes.**
 11 **Q.** Okay. Did anyone ask you to remove that section,
 12 sir?
 13 **A. No.**
 14 **Q.** You did it on your own?
 15 **A. Yes.**
 16 **Q.** Okay. And did you have correspondence with
 17 anyone at EPD during this time?
 18 **A. Correspondence regarding this?**
 19 **Q.** The subject matter we have been talking about,
 20 yes, sir.
 21 **A. I probably had some correspondence.**
 22 **Q.** Okay. Let's take a look at that correspondence,
 23 if we might. Can you please turn to tab 17.
 24 **A. Yes.**
 25 **Q.** Okay. This is a document marked FX-85, and it

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1 contains both a memo and an e-mail. And I think
 2 we'll start with the e-mail on the very last
 3 page.
 4 **A. The very last page?**
 5 **Q.** Yes, sir.
 6 **A. Ending with 391?**
 7 **Q.** Yes, sir.
 8 **A. I'm here.**
 9 **Q.** Okay. And if you look at the e-mail at the
 10 bottom of the page -- I'll give you a moment to
 11 review it; but it's entitled, subject line,
 12 Thoughts, and then in all caps, FOR YOUR EYES
 13 ONLY. Do you see that?
 14 **A. I'm sorry -- okay. Okay. Okay.**
 15 **Q.** Do you recall an e-mail exchange with Mr. Cliff
 16 Lewis, Dr. Gail Cowie, and Mr. Napoleon Caldwell
 17 in February of 2012, sir?
 18 **A. We must have some -- have had some discussion on**
 19 **this.**
 20 **Q.** At the very bottom of the page there's a
 21 reference to Ag permitting. At this point in
 22 time, sir, did you believe that EPD was issuing
 23 permits in the red and yellow zones of the Flint
 24 River Basin?
 25 **A. I'm not aware of that.**

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1 **Q.** Okay. Do you have any reason to doubt what
 2 Mr. Caldwell wrote?
 3 **A. I have no basis of judging whether or not that's**
 4 **accurate.**
 5 **Q.** Okay. Let's turn to the -- flip back to the
 6 front of the memo and actually look at the second
 7 page. It's a little difficult to read; but if
 8 you bear with me, you will see that in the fifth
 9 line from the bottom on the first paragraph,
 10 there's a bracket. And it goes on to say, the
 11 reason we were able to focus more. May I ask
 12 that you read that bracketed sentence that ends
 13 with, dash, way.
 14 **A. Could you tell me which paragraph it is?**
 15 **Q.** Yes. It's the paragraph at the top of the page,
 16 and it's a little difficult to find. But if you
 17 look, it's the fifth line up; and it's
 18 highlighted on the screen.
 19 **A. I'm sorry. Did you say the first page or the**
 20 **second?**
 21 **Q.** The second page, sir.
 22 **A. I'm sorry.**
 23 **The first paragraph?**
 24 **Q.** Yes, sir. And if you look on your screen, it
 25 might help you locate it.

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1 **A. Oh, yeah. Okay.**
 2 **I see that, yes.**
 3 **Q.** Okay. Did you write that?
 4 **A. I wrote that, yes.**
 5 **Q.** Okay. And you wrote that to whom?
 6 **A. I think I wrote that back to Nap Caldwell.**
 7 **Q.** Okay. And if you look at the bottom of the page,
 8 it's listed Options. Do you see that?
 9 **A. Yes.**
 10 **Q.** And the first option says, quote, be forthright
 11 about the results of the Flint River Drought
 12 Protection matrix. Do you see that?
 13 **A. I see that.**
 14 **Q.** And did you agree with that?
 15 **A. I agreed, yes.**
 16 **Q.** And you believed it was important to be
 17 forthright about the application of the matrix?
 18 **A. I believe it is correct to be forthright.**
 19 **Q.** Okay. Sir, may we please turn to tab 18.
 20 **A. Yes.**
 21 **Q.** This is a document designated as FX-88, and it's
 22 entitled Wei's Modifications. And then there is
 23 a parentheses, it says, 18 February, 2012. Do
 24 you see that?
 25 **A. I see that.**

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1 **Q.** Okay. Did you prepare this document?
 2 **A. I don't believe so.**
 3 **Q.** Anyone else named Wei at EPD?
 4 **A. Not that I'm aware of.**
 5 **Q.** Okay. Can I ask you to read the last -- the
 6 second-to-last paragraph on this page entitled
 7 Wei's Modifications.
 8 **A. The second to the last paragraph?**
 9 **Q.** Yes, the one that begins, along those
 10 tributaries.
 11 **A. I have it.**
 12 **Q.** Okay. In February of 2012, Dr. Zeng, did you
 13 believe that there were some tributaries of the
 14 Flint River that would experience flow benefits
 15 if agricultural irrigation were suspended?
 16 **A. I think it depends on where the acreage is**
 17 **relative to the streamflow. So it's hard to --**
 18 **it's hard to determine where the acreage and the**
 19 **benefit of the acreage removal would benefit the**
 20 **streams.**
 21 **Q.** Okay. Would there be any acreage anywhere in the
 22 Flint River Basin where suspension of
 23 agricultural irrigation would benefit streamflow
 24 in February of 2012?
 25 **A. Now, if the acreage can be pinpointed to a**

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1 **specific location where there's -- there's been**
 2 **streamflow, then it's possible.**
 3 **Q.** And my question was was there any such location
 4 in the entire basin where suspension of Ag
 5 irrigation would benefit streamflow?
 6 **A. I did not have enough information to give you an**
 7 **answer.**
 8 **Q.** Okay. Did you ever do any analysis in February
 9 2012?
 10 **A. We looked at certain places. We looked at the**
 11 **groundwater levels, and we looked at some**
 12 **streamflows, yes.**
 13 **Q.** Okay. And did you look at Spring Creek?
 14 **A. We did.**
 15 **Q.** And what was your conclusion at Spring Creek?
 16 **A. The -- Spring Creek there's a -- there's a pretty**
 17 **good indicator. There's a well right next to the**
 18 **stream. And we observed the historic data, and**
 19 **there seems to be a threshold. So when the**
 20 **groundwater level falls below that very level,**
 21 **then Spring Creek becomes -- then the flow at**
 22 **Spring Creek ceased to flow. So we know that.**
 23 **Q.** So --
 24 **A. So that was one piece of information that we had**
 25 **at the time.**

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1 **Q.** Okay. And did you also have a piece of
 2 information that suggested suspending irrigation
 3 near Ichawaynochaway Creek would indeed benefit
 4 streamflow?
 5 **A. I don't recall a specific study on that.**
 6 **Q.** Isn't that what it says in the first sentence of
 7 the paragraph you just read?
 8 **A. I'm not sure that was referencing a study --**
 9 **Q.** Okay.
 10 **A. -- or a speculation. I'm not sure.**
 11 **Q.** But --
 12 **A. Let me clarify. Sorry.**
 13 **Even though this thing is titled Wei's**
 14 **Modifications, I really don't have any**
 15 **recollection of modifying it or -- and I believe**
 16 **this was not from -- that this file was not**
 17 **collected from my file.**
 18 **Q.** Okay. Turn to tab 19, please, sir. This is a
 19 document designated as FX-904. I'll give you a
 20 moment, sir, to review this e-mail. I want to
 21 pay particular attention to the paragraph that
 22 begins, so the third element of the series.
 23 **A. I see that.**
 24 **Q.** Okay. There's a reference to the work that Wei
 25 and Menghong did? Who is Menghong?

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1 **A. He's a member of my unit.**
 2 **Q.** In the hydrology unit?
 3 **A. Yes.**
 4 **Q.** Okay. Do you recall performing any work in
 5 February of 2012 to evaluate whether there was
 6 streamflow -- streamflow benefits of suspending
 7 irrigation, sir?
 8 **A. I think -- are you referring to the one that**
 9 **Menghong and I did or something else?**
 10 **Q.** I'll ask my question again. Did you and
 11 Mr. Menghong -- Dr. Menghong perform any analysis
 12 to evaluation the streamflow benefits of
 13 suspending agricultural irrigation in February of
 14 2012?
 15 **A. We probably did.**
 16 **Q.** And what do you recall about the conclusions you
 17 reached?
 18 **A. I think this is the one that I referenced earlier**
 19 **on Spring Creek. So the well level was at the**
 20 **threshold or below the threshold. So we looked**
 21 **at the well level as a good indicator for the**
 22 **stream to cease to flow. And we believed the**
 23 **level at that time would indeed be below the**
 24 **threshold so that suspension of irrigation will**
 25 **not help the groundwater level, which in turn**

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1 **would sort of indicate a dry stream anyway.**
 2 **Q.** Okay. You looked at Spring Creek. What other
 3 locations in the Flint River Basin did you look
 4 at?
 5 **A. I don't recall specific locations; but I do**
 6 **recall an overall -- an overall modeling work**
 7 **which is to look at the entire amount of impact**
 8 **but not specific streams other than Spring Creek.**
 9 **Q.** And did this overall conclusion lead you to tell
 10 your colleagues at EPD that if we suspend
 11 agricultural irrigation, it's not going to
 12 matter; it's not going to influence streamflow?
 13 Is that what you said?
 14 **A. No. We don't have -- well, the overall and the**
 15 **specifics are at different geographic levels. So**
 16 **one is you look at the entire basin. The other**
 17 **one is you look at specific streams or**
 18 **sub-watersheds. And so we did not have**
 19 **information detailed enough for us to zoom in**
 20 **from the -- from the large basin with the**
 21 **exception of Spring Creek where there is an**
 22 **indicator.**
 23 **Q.** Okay. Mr. Caldwell writes, we cannot make a
 24 similar assertion elsewhere in the Flint, either
 25 because we don't have the data or the data we

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1 have do not support the conclusion.
 2 Do you know which one of those contingencies
 3 was actually occurring?
 4 **A. We don't have enough detailed enough data to tell**
 5 **us that there would be a benefit.**
 6 **Q.** So you could not say that there would be a
 7 benefit. Could you say there wouldn't be a
 8 benefit?
 9 **A. There was just not enough information for us to**
 10 **say, I think, one way or the other.**
 11 **Q.** So you couldn't say one way or the other?
 12 **A. I couldn't say.**
 13 **Q.** All right. Let's look at the next exhibit,
 14 tab 20.
 15 MR. QURESHI: Mr. Walton, if we could
 16 just leave this on here and put tab 20 side
 17 by side.
 18 BY MR. QURESHI:
 19 **Q.** Are you ready, Dr. Zeng?
 20 **A. Yes. Thank you.**
 21 **Q.** This is a press release marked JX-69. I would
 22 like to direct your attention to the first
 23 sentence of the second paragraph, and in
 24 particular the conclusion that invocation of the
 25 Drought Protection Act would have a negligible

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1 impact on surface water flows this year.
 2 Do you see that, sir?
 3 **A. Where is that?**
 4 **Q.** The second paragraph, first sentence.
 5 **A. I see that.**
 6 **Q.** Okay. You didn't have the data to support that
 7 statement; did you?
 8 **A. Well, I did not have the data to say that it**
 9 **would definitely be a benefit.**
 10 **Q.** And you didn't have the data to say that it
 11 wouldn't be a benefit?
 12 **A. I didn't have the data.**
 13 **Q.** You didn't know either way?
 14 **A. I didn't know either way.**
 15 **Q.** Did you see this before it went out?
 16 **A. I probably did.**
 17 **Q.** Did you tell anybody that you don't have the data
 18 to support this?
 19 **A. What we -- we had a discussion. We had an**
 20 **internal discussion about this. And so, yes,**
 21 **they were aware of the information.**
 22 **Q.** And the internal discussion with whom?
 23 **A. With staff.**
 24 **Q.** Did you talk to Director Turner?
 25 **A. I'm not sure I spoke -- specifically talked to**

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1 **him about this; but there was internal staff**
 2 **discussion.**
 3 **Q.** We're talking about just the hydrology unit?
 4 **A. No. It would be -- it would be beyond the**
 5 **hydrology unit.**
 6 **Q.** Okay. Did you do anything to communicate to
 7 Director Turner that the information in this
 8 press release is not accurate?
 9 **A. I'm not sure the information provided here could**
 10 **be characterized as inaccurate. So for the**
 11 **streams that ceased to flow, for those streams**
 12 **that ceased to flow, that is accurate. For those**
 13 **streams that are still having some flow, but at**
 14 **the edge, I'm not sure. So we don't have**
 15 **information to say there would be a benefit.**
 16 **Q.** You only looked at Spring Creek?
 17 **A. We did.**
 18 **Q.** You didn't look at any other stream?
 19 **A. We looked at the entire basin.**
 20 **Q.** And what did you conclude?
 21 **A. Well, we looked at the entire basin. We know**
 22 **that -- the amount of impact; and we don't have**
 23 **information specific enough to detail locations.**
 24 **Q.** Dr. Zeng, does EPD still use the drought matrix?
 25 **A. I don't think so.**

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1 Q. Okay. What new matrix does it use?

2 A. **There are gages that we can look at; and we have**

3 **a -- we have a general drought indicator that we**

4 **publish.**

5 Q. And whose job is it to do that?

6 A. **That -- that functionality resides in my unit.**

7 Q. Okay. Do you make recommendations?

8 A. **Well, we constantly update the information. And**

9 **if we see information that is -- that's turning**

10 **toward the adverse hydrologic conditions, I will**

11 **certainly alert the different levels of**

12 **management.**

13 MR. QURESHI: Your Honor, I'm ready to

14 move to another topic. But I can also take a

15 break if -- I have about another hour, I

16 think.

17 SPECIAL MASTER LANCASTER: Whatever

18 suits you.

19 MR. QURESHI: I would like to get some

20 water, if I may.

21 SPECIAL MASTER LANCASTER: Sure.

22 MR. QURESHI: Thank you.

23 SPECIAL MASTER LANCASTER: Why don't we

24 take a break.

25 (Time Noted: 10:11 a.m.)

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1 (Recess Called)

2 (Time Noted: 10:24 a.m.)

3 MR. QURESHI: Thank you, your Honor.

4 BY MR. QURESHI:

5 Q. Dr. Zeng, I would like to move on to a different

6 topic now, and that is your involvement in state

7 water planning resource assessments.

8 A. **Yes.**

9 Q. You described this involvement in paragraph 76,

10 which is on page 27 of your direct testimony.

11 And you explain that the hydrology unit of EPD

12 provides technical analysis and modeling to

13 support statewide water planning efforts. Is

14 that correct?

15 A. **That's correct.**

16 Q. And this work includes modeling for hydraulic --

17 hydrologic resource assessments that are a major

18 part of the planning process; is that right?

19 A. **That's correct.**

20 Q. And resource assessments are evaluations of

21 whether water resources are sufficient to meet

22 water demands; is that right?

23 A. **In the very general sense, yes.**

24 Q. In 2010 EPD conducted a statewide surface water

25 availability assessment; is that right?

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1 A. **That's correct.**

2 Q. And if you turn with me to tab 23, you might

3 recognize the document there as the Surface Water

4 Availability Assessment, designated JX-148.

5 A. **I see that.**

6 Q. And am I correct that the assessment was

7 undertaken to evaluate the availability of water

8 to meet demands without depleting flows below

9 certain identified federal or state thresholds?

10 A. **Well, the objective of the assessment is to look**

11 **at the amount of available water as provided by**

12 **Mother Nature and then to look at water use as we**

13 **understood it. And sometimes we overestimate**

14 **that. And then to look at whether or not there's**

15 **enough water to meet both demand and some set of**

16 **in-stream flow threshold or initial -- initial**

17 **threshold that we -- that I designated.**

18 Q. Okay. And I want to focus on this part because I

19 think that's important, the threshold part.

20 A. **Okay.**

21 Q. Before we get to the threshold part, instances in

22 which the flows fall below the thresholds, those

23 are called resource gaps; is that right?

24 A. **That's how I define them in the technical work,**

25 **yes.**

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1 Q. Okay. And the thresholds that you referred to,

2 those are consistent with Georgia state policy on

3 maintaining minimum flows for surface water, sir?

4 A. **I think that is not a correct characterization.**

5 **The policy was used in permitting, and it was**

6 **used in permitting municipal and industrial**

7 **facilities. So the way it works is the**

8 **facilities would need to have a measure so that**

9 **they don't affect the threshold. And so for --**

10 **so that's what the policy was intended for.**

11 **Now, when I directed the resource assessment,**

12 **I had to have a threshold against which I could**

13 **compare the modeling results. And because of the**

14 **lack of more solid information on that front, I**

15 **borrowed the -- I borrowed the policy for this**

16 **purpose.**

17 Q. Okay. I appreciate that clarification. That's

18 very helpful.

19 So the policy provides a threshold for

20 permitting purposes, and you decided to use that

21 in conducting your resource assessment?

22 A. **For -- yes.**

23 Q. And that policy that applies to permitting,

24 that's called Georgia's Interim In-stream Flow

25 Protection Strategy?

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1 **A. Policy.**
 2 **Q.** Policy, right.
 3 Interim In-stream Flow Protection Policy?
 4 **A. That's correct.**
 5 **Q.** And the In-stream Flow Protection Policy contains
 6 a different threshold depending on whether a
 7 stream is regulated or unregulated?
 8 **A. Well, I think a part of that is -- in fact, the**
 9 **policy contains three different types of -- three**
 10 **different types of -- three options, I would say,**
 11 **three options. And so there's an option that**
 12 **calls for monthly 7Q10 or natural flow, whichever**
 13 **is lower.**
 14 **And there is a second one which is a**
 15 **site-specific study which says you have a**
 16 **specific site and that at that site there's a**
 17 **value. Either it's ecological, biological or**
 18 **other type of value that people can identify at**
 19 **that location. And so there needs to be a study**
 20 **for that that's a site specific option.**
 21 **And then there is a third option which has to**
 22 **do with annual average flow, and there you do**
 23 **have a separation between regulated and**
 24 **unregulated.**
 25 **Q.** Okay. So let me make sure I understand this.
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1 The policy provides for three levels of
 2 threshold. One is the 7Q10. One is the site
 3 specific. And one is the average annual
 4 discharge; is that right?
 5 **A. It's not three levels. It's three options.**
 6 **Q.** Three options.
 7 **A. Right.**
 8 **Q.** And the option that you picked in doing the
 9 resource assessment was the 7Q10?
 10 **A. The monthly 7Q10 or inflow, whichever is lower.**
 11 **Q.** Okay. Can you tell us what a 7Q10 is?
 12 **A. Right. A 7Q10 is one type of low flow measure.**
 13 **It's -- so if you have 100 years of data -- 100**
 14 **years of data, seven-day average data, and you**
 15 **would pick the lowest in each year. And then you**
 16 **go from the lowest to the 90 -- to the 90th**
 17 **lowest. So you would ignore 10, go to the 10th**
 18 **lowest, which kind of have 9 points above it, but**
 19 **10 points below it. So that is the monthly --**
 20 **that is the 7Q10 concept on an annual basis.**
 21 **And this thing can be done for each month.**
 22 **That way you have a flow threshold that is**
 23 **roughly between 90 percent of the points and 10**
 24 **percent of the points.**
 25 **Q.** Okay. Sir, you were aware that as early as 1995
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1 Florida's -- I'm sorry -- Georgia's Department of
 2 Natural Resources was critical of the use of the
 3 7Q10 threshold to protect streams? Did you know
 4 that?
 5 **A. Vaguely.**
 6 **Q.** Okay. Well, let's turn to that. May I please
 7 direct you to tab 25. It's a document designated
 8 as FX-36. Have you seen this document before,
 9 sir?
 10 **A. I have.**
 11 **Q.** Okay. I would like to direct you to the
 12 Executive Summary and request that you read the
 13 first paragraph, focusing on the sentence that
 14 reads, Georgia's present policy protects
 15 streamflow, and read that all the way to the end
 16 of the sentence.
 17 **A. I see that.**
 18 **Q.** Okay. Sir, you mentioned that you were vaguely
 19 familiar with this document. When you picked the
 20 7Q10 threshold for the resource assessments, did
 21 you know that the 7Q10 was not intended to
 22 establish flow conditions for aquatic organisms?
 23 **A. Well, when I picked the option here, I wasn't**
 24 **really considering the aquatic resources because**
 25 **I think the -- all of these thresholds -- all of**
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1 **these thresholds, regardless of the option, they**
 2 **are some sort of a statistical threshold from an**
 3 **existing dataset; right? So they don't**
 4 **address -- they actually don't address any**
 5 **specific issues at specific locations.**
 6 **And the reason I picked one is because this**
 7 **is the starting point of a long and evolving**
 8 **planning process. I had no intention of keeping**
 9 **one threshold there forever because we are moving**
 10 **toward -- I was talking with the council members,**
 11 **the regional planning council members, about**
 12 **establishing site-specific criteria, about having**
 13 **them help us identify the values that need to be**
 14 **protected. I said this numerous times with the**
 15 **council members in numerous council meetings.**
 16 **And so my intent is to have that**
 17 **site-specific criteria established throughout**
 18 **the state. And so what I chose was only a**
 19 **starting point. It was only a -- a very early**
 20 **benchmark against which we can evaluate the model**
 21 **simulations.**
 22 **Q.** I understand that, sir. And, again, the date of
 23 the document we're reading is 1995. You did your
 24 resource assessment when?
 25 **A. 2009 or 2010, I believe.**
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1 Q. Okay. Can you turn with me to the next page and
 2 read the sentence that begins, many states have
 3 developed.
 4 A. Which page?
 5 Q. The very next page. Roman numeral II is at the
 6 bottom.
 7 A. Which paragraph?
 8 Q. The very top of the page, the first sentence that
 9 begins, many states have developed.
 10 We'll highlight it for you. It might make it
 11 easier.
 12 A. Oh, I see. I see that.
 13 Q. And my question is when you picked the 7Q10
 14 threshold for the resource assessment, did you
 15 know that other states had developed
 16 comprehensive in-stream flow policies?
 17 A. Well, I was aware of alternatives, yes.
 18 Q. Okay. Please turn with me to page 3 of this
 19 document. It's numbered page 3.
 20 A. Yes.
 21 Q. And can you please read the first sentence of the
 22 second paragraph --
 23 A. Starting --
 24 Q. -- there?
 25 A. -- while it is critical?

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1 Q. No, sir. Starting with, there is clear
 2 consensus.
 3 A. I'm not following you. Sorry.
 4 Q. I may have the wrong page number, but on my
 5 version it's page 3 of FX-36.
 6 A. Roman III?
 7 Q. No. It's the actual arabic 3.
 8 A. Oh, I'm sorry.
 9 Oh, yes, I'm here.
 10 Q. Okay. So it's the second paragraph; and it
 11 states, there is clear consensus. Can you please
 12 read that paragraph, sir.
 13 A. I see that.
 14 Q. Okay. At the time you picked the 7Q10 threshold,
 15 did you know that that was designed to limit
 16 concentration of pollutants rather than to
 17 protect aquatic habitat?
 18 A. Well, let's make a distinction between 7Q10 and
 19 monthly 7Q10. I'm aware that 7Q10 is for the
 20 purpose of NPDES discharging treated wastewater.
 21 I'm aware of that.
 22 Q. Okay.
 23 A. But monthly 7Q10's are higher usually than the
 24 annual 7Q10's, and they also provide seasonality.
 25 So I'm not sure we can say monthly 7Q10's are for

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1 diluting discharge wastewater purpose.
 2 Q. Okay. Sir, can you now turn with me to page 27.
 3 A. Page 27.
 4 Q. Okay. I request that you read the concluding
 5 paragraph of this 1995 document.
 6 A. Which is the concluding paragraph? The very last
 7 one?
 8 Q. Yes, sir. It begins with, as aquatic systems
 9 continue to be impacted.
 10 A. I see that.
 11 Q. Okay. And my question is when you were preparing
 12 the resource assessment, did you have any
 13 deliberations with your colleagues about picking
 14 a different threshold?
 15 A. We had.
 16 Q. And you decided to use monthly 7Q10?
 17 A. Well, we had internal discussions; and we also
 18 had exchanges with a -- what we call scientific
 19 and engineering advisory panel. We invited
 20 scientists around the state, around the country
 21 actually to help us guide us on determining
 22 streamflow protection and thresholds. And I was
 23 the one who asked the panel, you know, what to
 24 use. And I wasn't given a specific -- I wasn't
 25 given a specific answer. The answer was always a

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1 wide range of options, and each one having to do
 2 with something, and another one having to do with
 3 something else.
 4 So that is why I say I started the process
 5 with an option that I chose; and I never intended
 6 for that to be cast in stone. I always intended
 7 for this to be the starting point in the evolving
 8 process.
 9 Q. Understood.
 10 A. And we are moving -- we're always moving towards
 11 site specifics. If there are habitats along
 12 specific locations, specific regions of the
 13 rivers, we like to identify those. I would like
 14 to know, and I would like to have those as the
 15 basis of our future assessments.
 16 Q. Are you finished, sir?
 17 A. Yes.
 18 Q. Okay. Thank you. I want to go back to that
 19 resource assessment. But before we get to that,
 20 I want to take a little detour and look at a
 21 journal article that you published behind tab 4
 22 entitled Investigation of Uncertainties in
 23 Surface Water Resource Assessment of Georgia's
 24 State Water Plan. That's FX-908.
 25 A. Did you say tab 4?

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1 Q. 24, sir.

2 A. **Oh, I'm sorry.**

3 **I'm here.**

4 Q. Okay. And based on my reading of page 229, I

5 understand that the purpose of the article was to

6 address concerns from stakeholders regarding

7 uncertainty in the resource assessment process

8 and results. Is that -- is that accurate?

9 A. **That is correct.**

10 Q. Okay. And based on the study that's published

11 here, you have a tremendous amount of confidence

12 in the surface water resource assessment that

13 uses the 7Q10 monthly thresholds?

14 A. **I don't think that is a correct characterization**

15 **of this paper.**

16 Q. Okay. Can you turn with me to page 236 of the

17 paper?

18 A. **Yes.**

19 Q. And I would ask you to read the section under

20 Summary and Conclusions and the very -- you're

21 welcome to read the entire section. But I'm

22 focused on the first paragraph under Summary and

23 Conclusions and the last sentence.

24 A. **I see that.**

25 Q. Okay. Is that a true statement at the time you

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1 wrote it?

2 A. **Well, it is a true statement. It is a true**

3 **statement regarding the process itself.**

4 Q. So you had confidence in the process you used to

5 identify resource gaps?

6 A. **That's correct.**

7 Q. Thank you. All right. Now, let's turn to the

8 resource gaps themselves. And we'll need to go

9 back to the state water resource surface water

10 availability assessment at tab 23.

11 A. **I'm here.**

12 Q. Okay. And in particular, sir, may I direct you

13 to page 22. There is a variety of tables on

14 page 22. The one row that I'm interested in most

15 is the one that says Bainbridge. Do you see

16 that?

17 A. **I see that, yes.**

18 Q. And where is Bainbridge?

19 A. **Bainbridge is the lowest gage on the Flint River.**

20 Q. And am I correct in reading this that the flow

21 regime target identified through the process in

22 which you have a great deal of confidence is

23 2506?

24 A. **That is one of many.**

25 Q. Okay. That's the one listed here?

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1 A. **That is one of many, yes.**

2 Q. Okay. And the 2506 is the one listed here, sir?

3 A. **That's just for that day, yes. That's for one**

4 **day, yes.**

5 Q. Okay. It could be higher. It could be lower.

6 But you have highlighted 2506 as an example?

7 A. **For that day, yes.**

8 Q. Okay. And you have also identified the

9 percentage of time that the flow regime -- the

10 modeled flow regime falls below that particular

11 target. Is that correct?

12 A. **I think I need to rephrase that, if I may.**

13 Q. Certainly.

14 A. **The simulated -- so 12 percent of the time -- for**

15 **12 percent of the time the simulated flow using a**

16 **very conservative overestimated demand water use**

17 **data would have the simulated flow being lower**

18 **than the flow regime as I decided what the flow**

19 **regime was. Right?**

20 **But that -- but that also means that there is**

21 **88 percent of the time when there is not a gap.**

22 Q. Okay. Thank you for rephrasing that. So these

23 are modeled results; is that fair?

24 A. **That's correct.**

25 Q. Okay. And has EPD done any work to identify

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1 other thresholds since the time this report was

2 issued in 2010?

3 A. **Other thresholds meaning for resource assessment?**

4 Q. Other thresholds at Bainbridge for resource

5 assessment.

6 A. **There's one ongoing round of state water plan --**

7 **original water plan review and revision process;**

8 **and we have been discussing alternatives. But**

9 **just -- just in the context of resource**

10 **assessment, no, we haven't had a -- had a change**

11 **in the flow threshold. But we have had**

12 **discussions.**

13 Q. Okay. And these discussions occurred after this

14 assessment came out in 2010 --

15 A. **That's correct.**

16 Q. -- and are --

17 A. **Sorry.**

18 Q. And are still occurring?

19 A. **Yes.**

20 Q. Okay. Do you know how often the daily mean flows

21 at Bainbridge are below the 2506 cfs threshold?

22 A. **I don't right off the top of my head.**

23 Q. Okay. I'll invite you, sir, to look at

24 demonstrative tab B in your little booklet.

25 A. **I'm here.**

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1 Q. Okay, sir. And you will see that there's a
 2 variety of gage readings from USGS and for
 3 different water years. And a water year is from
 4 October through September of the following year;
 5 is that correct?
 6 A. **That's correct.**
 7 Q. Okay. So behind tab B we have the USGS flow
 8 records at Bainbridge for water year 2012. And,
 9 sir, you will see that the daily mean flow was
 10 below the 7Q10 threshold for almost eight months.
 11 Do you see that?
 12 A. **Well, I think -- I think we need to make some**
 13 **clarification here.**
 14 Q. And you will have an opportunity to do that when
 15 your counsel asks questions. My --
 16 A. **Well --**
 17 Q. My question is on B1, do you see that for eight
 18 months the flows at Bainbridge are below 2506?
 19 That's my question.
 20 A. **I do see a number -- I do see many numbers being**
 21 **highlighted with yellow color as being lower than**
 22 **2500 cfs. However -- however, the 28 -- the**
 23 **2500, 2506 number that was identified here was**
 24 **for one month. It was for one month. So we are**
 25 **comparing a number in one month with numbers from**
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1 **the other month.**
 2 **If you want to make that comparison, that's**
 3 **fine. But I just wanted to make sure that we all**
 4 **understand what kind of comparison we are making.**
 5 Q. Sir, is it your position that in 2012 the flow
 6 records at Bainbridge were at record -- were not
 7 at record lows?
 8 You're not saying that; are you?
 9 A. **I'm not sure of the question. Can you say the**
 10 **question again?**
 11 Q. Sure. Are you suggesting that the flow records
 12 at Bainbridge during 2012 were just fine?
 13 A. **That's certainly not what I'm saying.**
 14 Q. Okay. In fact --
 15 A. **But I'm -- sorry.**
 16 Q. If we can go back and look at a document that you
 17 wrote, we'll get a better idea of what the flows
 18 were at Bainbridge in 2012.
 19 Can you please turn with me, sir, to tab 13.
 20 A. **I'm here.**
 21 Q. Okay. And this is FX-82. And this is a memo
 22 that you wrote in September of 2011.
 23 A. **That's correct.**
 24 Q. Okay. If you turn to the second page under the
 25 streamflow in the Flint River section, can you
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1 please read the bottom paragraph in that section,
 2 the one that begins with, it is also very
 3 troubling to observe.
 4 A. **I see that.**
 5 Q. Okay. And when you wrote this, did you believe
 6 it to be true and accurate at the time?
 7 A. **It was true, yes.**
 8 Q. Okay. Has the gap identified at Bainbridge been
 9 mitigated?
 10 A. **The gap identified at Bainbridge was a modeling**
 11 **result.**
 12 Q. The description in FX-82 that you just read, is
 13 that a modeling result; or is that a real-world
 14 observation?
 15 A. **I thought you were talking about the state water**
 16 **planning gap. Right?**
 17 Q. Well, I'm talking about both, sir. In FX-82 you
 18 write that the low flow record has been broken in
 19 the past few days.
 20 A. **Right.**
 21 Q. Has EPD -- Georgia EPD done anything to mitigate
 22 those low flows at Bainbridge?
 23 A. **Well, those low flows are the combined results of**
 24 **low precipitation or drought, ongoing multi-year**
 25 **drought, and certainly, to some level,**
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1 **consumptive water use.**
 2 **Now, has EPD done anything about it? I think**
 3 **yes. EPD has implemented a moratorium in**
 4 **permitting in the basin; and EPD has put**
 5 **requirements for the farmers to have a higher**
 6 **efficiency irrigation, among other things.**
 7 Q. Okay. And it's convened a task force as well.
 8 Isn't that right?
 9 A. **Well, I just -- I just learned this a few days**
 10 **ago, yes.**
 11 Q. Okay. And you're not on it?
 12 A. **I'm not one of them.**
 13 Q. Okay. Let's talk now about Spring Creek, sir.
 14 You mentioned that in response to one of the
 15 earlier questions. Can you tell us where Spring
 16 Creek is, please?
 17 A. **Spring Creek is in between the Chattahoochee**
 18 **River and the Flint River. It used to be a small**
 19 **tributary to the Flint River. And after the**
 20 **impoundment of Lake Seminole by Jim Woodruff Dam,**
 21 **it flows directly into Lake Seminole.**
 22 Q. Can you please, sir, turn to tab 26. It says
 23 JX-21.
 24 A. **I'm here.**
 25 Q. Do you recognize this document, sir?
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1 **A. Yes.**
 2 **Q.** Okay. And you were involved in the modeling to
 3 support this Flint River Basin Regional Water
 4 Development and Conservation Plan?
 5 **A. Involved in, yes.**
 6 **Q.** Okay. May I ask that you turn to page 16 and
 7 read the paragraph that begins on the bottom of
 8 16 and carries over to the top of page 15 -- 17,
 9 please.
 10 **A. I see that.**
 11 **Q.** Okay. Did you play any role in preparing this
 12 particular section?
 13 **A. I -- I'm not sure I played a role in this. This**
 14 **seems to be a description of the criteria used to**
 15 **evaluate the modeling, but I'm not sure I had a**
 16 **role in writing this.**
 17 **Q.** Okay. Can you please turn to page 129, sir.
 18 **A. I'm here.**
 19 **Q.** Okay. And there is a section on Spring Creek
 20 that begins on 129 and then carries over to the
 21 following page. You're welcome to read as much
 22 of it as you like. I'm focused on the first
 23 sentence.
 24 **A. I see that.**
 25 **Q.** Okay, sir. And if you look at the table on the
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1 following page, it gives some context of the
 2 description here which explains that the modeled
 3 results indicate that criteria failed at very
 4 high rates except in August and September.
 5 Can you look at the table on 131 and tell us
 6 what the criteria is for Spring Creek in August
 7 and September?
 8 **A. Well, from the table, the criteria for lowest**
 9 **monthly one-day minimum there is zero.**
 10 **Q.** For August?
 11 **A. For August and September.**
 12 **Q.** Okay. And you would agree that a zero flow in
 13 any tributary to the Flint River is a bad thing?
 14 **A. It is a bad thing.**
 15 **Q.** And the criteria for June and July are less than
 16 1 cfs?
 17 **A. That's what the table says.**
 18 **Q.** Okay. And even in those months, the criteria
 19 failed in certain instances?
 20 **A. Yes.**
 21 **Q.** Okay. Can we flip back to page 51 of this
 22 particular document, JX-21, sir.
 23 **A. I'm here.**
 24 **Q.** Okay. And I'm interested in the section entitled
 25 Conclusions About Safe Yield. So you're welcome
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1 to take a moment to read that Section 2.5. It
 2 carries onto the page 52 as well.
 3 **A. I see it.**
 4 **Q.** Okay. Sir, in the page 51 near the bottom of the
 5 page it says that, expanded drought year
 6 irrigation will worsen the situation. Reduced
 7 irrigation will improve it. Do you agree with
 8 that?
 9 **A. Well, certainly irrigation has an effect on**
 10 **streamflow.**
 11 **Q.** And the particular statement that's written here,
 12 that if you expand drought year irrigation it
 13 will make the situation worse; whereas, if you
 14 reduce irrigation, it will improve it, do you
 15 agree with that statement?
 16 **A. Well, I think that depends on where you increase**
 17 **and where you reduce because -- because the**
 18 **situation is different from place to place. In**
 19 **certain places, if you expand, you don't see any**
 20 **effect. In certain places if you reduce, you**
 21 **don't see a beneficial effect. So it's location**
 22 **specific.**
 23 **Q.** Okay. And would you agree that there are
 24 locations along the Flint River Basin where if
 25 you reduce or suspend irrigation, it will have a
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1 benefit to streamflow?
 2 **A. I agree, yes.**
 3 **Q.** Okay. And have you identified those locations?
 4 **A. We actually have.**
 5 **Q.** Okay. Now, this report was issued in 2006 in
 6 March; is that correct?
 7 **A. Yes.**
 8 **Q.** Okay. And in March of 2006, the director of EPD
 9 did not invoke the Flint River Drought Protection
 10 Act?
 11 **A. Yes. But that -- that decision would not have**
 12 **been made in February 2006.**
 13 **Q.** Okay. And I appreciate that. I'm just focused
 14 on whether it was invoked or not.
 15 **A. Well, my understanding is that that was a no.**
 16 **Q.** And the same question with respect to 2007; was
 17 the Act invoked?
 18 **A. It was not.**
 19 **Q.** Are you aware that after issuing this document in
 20 March of 2006, EPD lifted its moratorium on
 21 irrigation permits?
 22 **A. I'm aware of that. Yes.**
 23 **Q.** Okay. And you're also aware that at that point
 24 in time it started issuing backlogged permits?
 25 **A. I'm aware of that. But I'm also aware that those**
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1 **are mostly in the so-called green areas that we**
 2 **identified as having the least amount of impact.**
 3 **Q.** Sir, may I invite you to turn to tab 27. This
 4 is a letter from the United States Department of
 5 Interior Fish and Wildlife Service to Mr. Rob
 6 McDowell of Georgia EPD. Do you know
 7 Mr. McDowell?
 8 **A. Yes.**
 9 **Q.** Okay. And what's his position with EPD?
 10 **A. I -- at this time I think he was -- he was the**
 11 **Flint River plan coordinator. I think that was**
 12 **his position.**
 13 **Q.** Okay. Can you please turn to page 7 of this
 14 letter. And I will invite you to read the first
 15 paragraph at the top of the page, sir.
 16 **A. Yes. First paragraph on page 7?**
 17 **Q.** Yes, sir.
 18 **A. Okay.**
 19 **Q.** The one that is under a section entitled Water
 20 Conservation in the Flint River Basin.
 21 **A. I see that paragraph.**
 22 **Q.** Okay. Did anyone ever tell you that the United
 23 States Fish and Wildlife Service determined in
 24 2006 that the roof for the Flint River Basin was
 25 leaking in some places quite badly?

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1 **A. Did anybody tell me?**
 2 **Q.** Had you ever heard that?
 3 **A. I have not heard that analogy.**
 4 **Q.** Okay. You're the person who has the most
 5 knowledge and experience regarding the hydrology
 6 of the ACF Basin, and you were unaware that the
 7 Fish and Wildlife Service had made that analogy?
 8 **A. Well, this was -- this letter was dated**
 9 **January --**
 10 **Q.** 2006.
 11 **A. -- 2006.**
 12 **So this letter was dated January 2006. And**
 13 **it was the time before I became manager and**
 14 **before I became chief hydrologist of the state.**
 15 **I was a staff engineer at the time. So you're**
 16 **right; nobody told me about this specific**
 17 **argument.**
 18 **Q.** Okay. You -- you view this as an argument?
 19 **A. Well, this is a statement. This is a statement.**
 20 **Q.** And in your 10 years plus at EPD, you were
 21 unaware of this statement?
 22 **A. I'm unaware of this statement.**
 23 **Q.** Sir, I would like to now move on to another
 24 topic. And that topic is Decline in Incremental
 25 Flow. In paragraph 154 at pages 54 and 55 of

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1 your direct testimony, you claim that you
 2 analyzed two USGS streamflow gages on the
 3 Apalachicola River and observed a decline in
 4 incremental flow from 1972 through 2012. Is that
 5 right?
 6 **A. That's what the graph shows.**
 7 **Q.** Okay. And by incremental flow, sir, do you mean
 8 the amount of additional water added to the
 9 Apalachicola because of precipitation in the
 10 Florida portion of the basin?
 11 **A. That's correct, the portion of the precipitation**
 12 **that falls in the Florida part of the basin that**
 13 **is converted into streamflow.**
 14 **Q.** You also say in paragraph 158 of your testimony
 15 that you're unaware of any explanation offered by
 16 Florida as to the cause of this incremental flow
 17 decline. Is that correct?
 18 **A. That's correct.**
 19 **Q.** And to do your analysis and reach your
 20 conclusions, you relied on USGS gage
 21 measurements?
 22 **A. Well, it was an analysis. I'm not sure there was**
 23 **a conclusion. But, yes, I relied on USGS data.**
 24 **Q.** So the analysis you did relied on USGS gage data?
 25 **A. That's correct.**

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1 **Q.** And the gage data is taken from specific
 2 locations along the Apalachicola, sir?
 3 **A. That's correct.**
 4 **Q.** And the two gages you analyzed were at
 5 Chattahoochee and Sumatra?
 6 **A. That's correct.**
 7 **Q.** And you're aware, sir, that in 2016 the USGS
 8 noted anomalies in measurements of flow between
 9 Chattahoochee and Sumatra?
 10 **A. I'm aware of that.**
 11 **Q.** Okay.
 12 **A. But I'm also aware that they qualified the**
 13 **problematic area, the error, which was between**
 14 **the 1990 -- mid-1990 to 2002. They said some of**
 15 **the high flows were not gaged correctly during**
 16 **that period, 1994, I believe, to 2002.**
 17 **Q.** If we turn to tab 28, that might refresh your
 18 recollection about the exact dates. It's FX-515.
 19 It's a letter from the U.S. Geological Survey to
 20 the Northwest Florida Water Management District.
 21 And in the second paragraph, they refer to rating
 22 changes made during 1990 through 2002. Do you
 23 see that?
 24 **A. I see that.**
 25 **Q.** And, sir, are you also aware that the USGS has

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1 pulled all Sumatra Gage data from its website?

2 **A. I'm aware of that.**

3 **Q.** Okay. You don't mention any of that in your

4 prefiled direct testimony; do you?

5 **A. I didn't.**

6 **Q.** Okay.

7 **A. I wasn't aware of that.**

8 **Q.** I'm sorry; you were not aware of that?

9 **A. I wasn't aware of the USGS pulling its data.**

10 **Q.** You didn't -- you didn't check it recently?

11 **A. Well, I did recently, yes.**

12 **Q.** When did you check it?

13 **A. A couple of days ago.**

14 **Q.** Sir, I'll represent to you that it's unavailable

15 publicly on its website; and it hasn't been for

16 some time.

17 **A. I understand.**

18 **Q.** You worked with Dr. Menghong Wen?

19 **A. That's correct.**

20 **Q.** In fact, he assisted you in analyzing this issue;

21 isn't that right?

22 **A. Well, he, among others.**

23 **Q.** Okay. Well, let's look at tab 29, in particular

24 page FX-517.

25 **A. Yes.**

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1 also makes a statement regarding the fact that

2 incremental flow computation is not meaningful.

3 Were you aware of that when you prepared your

4 testimony?

5 **A. I'm aware of that statement. However, he was**

6 **referring to the daily flow. He was referring to**

7 **a computation on a daily flow basis. Right. The**

8 **analysis that I did -- that we did, that we**

9 **presented, was based on an annual flow basis. So**

10 **if you go back to the previous page, page -- the**

11 **page you just referred me to ending with 691, if**

12 **you look at the very last figure, the figure at**

13 **the bottom of the page, and it shows -- clearly**

14 **it shows a decline in incremental flow when you**

15 **analyze it on an annual basis.**

16 **Q.** And the analysis, again, involves looking at the

17 Sumatra Gage?

18 **A. That's correct.**

19 **Q.** That is no longer available?

20 **A. Not today.**

21 **Q.** Not for the last few months, sir.

22 **A. Okay.**

23 **Q.** Let's move on to paragraph 51 -- I'm sorry,

24 paragraph 146 on page 51 of your prefiled direct.

25 **A. Did you say 146?**

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1 **Q.** Do you recognize this document as something

2 prepared by Dr. Wen for you?

3 **A. Yes.**

4 **Q.** In fact, it was prepared at your direction; was

5 it not?

6 **A. That was correct.**

7 **Q.** And Dr. Wen is a hydrology -- a hydrologist Ph.D.

8 who works in the hydrology unit; isn't that

9 right?

10 **A. Yes.**

11 **Q.** Okay. Can you please turn to the seventh page of

12 this memo? It's not numbered, but the Bates

13 number is 691.

14 **A. I'm here.**

15 **Q.** Okay. There is a section entitled Sumatra

16 Incremental Flow. Why don't you take a moment to

17 read that paragraph.

18 **A. I see that.**

19 **Q.** Okay. And when you prepared your direct

20 testimony for this court, Dr. Zeng, did you

21 recall that your colleague had explained that

22 flow measurement error ranges make some

23 incremental flow computations look like nonsense?

24 **A. I'm aware of his statement, yes.**

25 **Q.** Okay. And if you look at the following page, he

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1 **Q.** Right. Paragraph 146 on page 51. And in this

2 paragraph you make some statements regarding

3 decline in precipitation.

4 **A. That's correct. Well, I would say changes in**

5 **precipitation.**

6 **Q.** Okay. And you're not a climate expert; are you?

7 **A. I'm a hydrologist.**

8 **Q.** So you are a climate expert?

9 **A. I'm not a climate expert.**

10 **Q.** Okay. And, in fact, at your deposition, you

11 testified that you didn't even know what a

12 hydroclimatologist was.

13 **A. That's correct.**

14 **Q.** And in performing your climate analysis, you rely

15 on climate division data; is that right?

16 **A. That's correct.**

17 **Q.** You don't use NOAA's gridded divisional dataset?

18 **A. I did not use the gridded data. That's correct.**

19 **Q.** Okay. May I please request that you look at the

20 demonstrative binder, the thin binder, behind

21 tab D.

22 **A. Yes.**

23 **Q.** And we printed out information from NOAA's

24 website. And I'll request that you please review

25 it to yourself, paying particular attention to

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1 the highlighted paragraphs.

2 **A. I see that.**

3 **Q.** Okay. You agree that the climate division data

4 you used is less modern than the gridded data?

5 **A. I disagree for the -- not for this purpose.**

6 **Q.** Okay. And do you know that NOAA has determined

7 that gridded data has better quality and coverage

8 than climate division data?

9 **A. That depends on the purpose, again. That depends**

10 **on the type of analysis you do.**

11 **Q.** And are you aware that the climate division data

12 that you are examining aren't even limited to the

13 ACF Basin?

14 **A. Well, climate division 4 and climate division 7**

15 **cover a large -- a majority of the drainage area**

16 **of the ACF Basin.**

17 **Q.** But they also contain counties that are not in

18 the ACF Basin, sir?

19 **A. They also contain counties outside the ACF Basin.**

20 **That's correct.**

21 **Q.** And they also omit some counties that are in the

22 ACF Basin?

23 **A. Very small portions, yes.**

24 **Q.** Okay. Was there any restriction on your ability

25 to use gridded data?

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1 **A. Well, as I said, gridded data is a more spatially**

2 **detailed data. So it goes beyond the rainfall,**

3 **the rain gages, the rain stations. But there is**

4 **an ongoing debate about the use of gridded data**

5 **because gridded data tends to overestimate the**

6 **low rainfall events. So there are times when the**

7 **stations are not recording rainfall. The gridded**

8 **data are saying we got rainfall. Okay. So there**

9 **is a debate about whether or not the gridded data**

10 **is the best to use.**

11 **The other side of the story is if you use the**

12 **gridded data for the purpose that I'm doing here,**

13 **you will need to aggregate the gridded data,**

14 **which means it's not lump average. You have to**

15 **lump it together, the same way you would lump it**

16 **together as the climatic division data.**

17 **Q.** I appreciate that explanation, sir. My question

18 was a little more basic.

19 **A. Okay.**

20 **Q.** And that question was was there any restriction

21 on your ability to use NOAA gridded data?

22 **A. Well, as I said it before -- as I said before, we**

23 **have questions. Because of the ongoing debate**

24 **within the community about gridded data, I chose**

25 **not to use that.**

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1 **Q.** But there was no restriction on your ability to

2 use it?

3 **A. There was no restriction. That's correct.**

4 **Q.** And the debate you're referring to, that's not a

5 debate that NOAA is having?

6 **A. Well, that's a debate that people in the**

7 **profession are having.**

8 **Q.** But not people who work for NOAA?

9 **A. Well, I don't know that.**

10 **Q.** All right. We just read their official

11 statement; didn't we, sir?

12 **A. Well, they didn't say that that climate division**

13 **data should not be used.**

14 **Q.** Okay. Sir, can we please turn to paragraph 150

15 of your direct testimony. And that's on page

16 153.

17 **A. Paragraph 150?**

18 **Q.** Yes, sir, on page 53. Do you see that?

19 **A. I'm reading it. Yes, I see that.**

20 **Q.** Okay. Now, in this analysis, you don't present

21 any information on consumptive use for the other

22 rivers you identified here; have you?

23 **A. I have not.**

24 **Q.** And you present your analysis as annual average

25 flows?

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1 **A. That's correct.**

2 **Q.** Not seasonal flows?

3 **A. Not seasonal flows.**

4 **Q.** Let's move now to your discussion of tri-state

5 negotiations, in particular, paragraph 137.

6 That's on page 48.

7 **A. 137?**

8 **Q.** Yes, sir. It's an entire section on tri-state

9 negotiations. But you're welcome to review as

10 much or as little as you like.

11 **A. Yes.**

12 **Q.** Okay. You state in your testimony that in past

13 negotiations, Florida took several positions that

14 made it difficult to ever reach compromise.

15 **A. That's correct.**

16 **Q.** And you also say that Florida would never specify

17 a scientifically0-justified water or flow level

18 that it believed it needed. Is that right?

19 **A. Well, they didn't provide the -- the kind of flow**

20 **threshold that are supported by scientific**

21 **evidence that can be implemented by the Corps.**

22 **Q.** And I believe you testified earlier that you

23 would want information from technical experts;

24 that if it came from lawyers, it wouldn't count?

25 **A. That's not what I meant.**

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1 **Q.** Okay. Well, so regardless of who presented the
 2 data, you would be open to reviewing it?
 3 **A. That's right.**
 4 **Q.** Okay. Do you know who former Secretary of DEP
 5 David Struhs is?
 6 **A. I do.**
 7 **Q.** Okay. Did you review his direct testimony in
 8 this matter?
 9 **A. I did not.**
 10 **Q.** Okay. Did you review his trial testimony in this
 11 matter?
 12 **A. I did not.**
 13 **Q.** Did you review his deposition testimony?
 14 **A. I did not.**
 15 **Q.** Okay. What kind of investigation did you do
 16 before making statements about the tri-state
 17 negotiations in your testimony?
 18 **A. My experience as part of the negotiation team.**
 19 **Q.** Okay. And what about before you joined EPD, the
 20 negotiations going back to the '90's, what
 21 analysis did you do of those?
 22 **A. Well, I was aware -- I was aware of the**
 23 **negotiations back then. And after I came on**
 24 **board, I was part of the team that -- that**
 25 **supported the negotiations, the chief negotiators**

1 **Q.** Okay. Why don't we look at tab 33. Perhaps that
 2 will help. It is a document labeled FX-199.
 3 Have you seen this document before, sir?
 4 **A. I'm not sure. This does not look familiar.**
 5 **Q.** Okay. So your investigation prior to submitting
 6 your testimony did not include any review of
 7 something like this?
 8 **A. I did not review this.**
 9 **Q.** Okay. If you turn to page 4, there is a
 10 discussion attributed to do Bob Kerr. Do you
 11 know who Mr. Kerr is?
 12 **A. Yes.**
 13 **Q.** Who is he?
 14 **A. He was -- I think he was the chief negotiator**
 15 **representing the State of Georgia --**
 16 **Q.** Okay.
 17 **A. -- in the ACF Compact negotiations.**
 18 **Q.** And I'll invite you to read the statements
 19 attributed to Mr. Kerr on pages 4 and 5.
 20 **A. I see that.**
 21 **Q.** Okay. Sir, when you prepared your testimony in
 22 this matter, were you aware that Georgia had
 23 indicated during negotiations that it would not
 24 agree with the consumptive limit?
 25 **A. I -- well, as staff engineer, I vaguely -- I was**

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1 **from Georgia. So I'm aware of some of the**
 2 **proposals.**
 3 **Q.** Okay. Are you aware of the proposal in FX-212
 4 behind tab 31?
 5 This is a letter from Mr. Doug Barr of the
 6 Northwest Florida Management District to Harold
 7 Reheis of Georgia EPD. And my question for you,
 8 sir, is have you seen this letter previously?
 9 **A. I have not seen this letter, but I do know that**
 10 **the discussions in the late 1990's did result in**
 11 **the set of flow requirements that are actually in**
 12 **a proposal.**
 13 **Q.** Let me turn you now to tab 32, the memorandum at
 14 FX-215 from Mr. Nolton Johnson to Harold Reheis.
 15 You know who Harold Reheis is. Right?
 16 **A. Yes.**
 17 **Q.** Do you know who Mr. Nolton Johnson is?
 18 **A. Yes.**
 19 **Q.** Did you review this memo before you prepared your
 20 direct testimony?
 21 **A. I did not.**
 22 **Q.** Okay. Do you know of any demands that Georgia
 23 made during the negotiations before you became
 24 part of EPD?
 25 **A. I'm not sure what you mean by demands.**

1 **vaguely aware of that.**
 2 **Q.** But you made no mention of that fact in your
 3 direct testimony?
 4 **A. I did not.**
 5 **Q.** Okay. Thank you very much, sir.
 6 SPECIAL MASTER LANCASTER: Mr. Primis?
 7 MR. PRIMIS: Thank you.
 8 We have some demonstratives and some
 9 exhibits of our own. May I approach?
 10 SPECIAL MASTER LANCASTER: Yes.
 11 EXAMINATION
 12 BY MR. PRIMIS:
 13 **Q.** Dr. Zeng, just picking up on that last line of
 14 questioning about the tri-state negotiations, can
 15 you look at paragraph 137 of your testimony.
 16 **A. Yes.**
 17 **Q.** In the fourth line, Mr. Qureshi might have missed
 18 it, but does it say, throughout your interactions
 19 with Florida?
 20 **A. That's correct.**
 21 **Q.** Is that what your written testimony was about?
 22 **A. Yes.**
 23 **Q.** Did Mr. Qureshi show you any documents from your
 24 interactions with Florida that contradict what
 25 you said here?

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1 **A. No.**

2 **Q.** Now, Dr. Zeng, I would like to take a step back

3 and put in context what it is that you do for the

4 State of Georgia. What is your current position?

5 **A. I am manager of EPD's hydrological analysis unit,**

6 **and the unit is sometimes referred to as the**

7 **hydrology unit. So in that role, I'm sometimes**

8 **referred to as the chief hydrologist of the**

9 **state.**

10 **Q.** Dr. Zeng, how long have you been doing that?

11 **A. I have been in this position for 10 -- more than**

12 **10 years.**

13 **Q.** And you have been at EPD how long?

14 **A. I have been in EPD since 2000, so 16 years.**

15 **Q.** Now, we have had a number of hydrologists in this

16 case come and testify. So it's been a good case

17 for the hydrology business. Can you tell the

18 Court what your understanding is of what a

19 hydrologist does?

20 **A. Right. What a hydrologist does is to study the**

21 **movement of water within the natural and human**

22 **environment.**

23 **Q.** You mentioned you have a unit that does this.

24 And how many people are in that unit?

25 **A. I have six staff members, so including myself,**

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1 **A. I have -- I am a registered professional**

2 **hydrologist with the American Institute of**

3 **Hydrology.**

4 **Q.** Is that an easy organization to get admitted to?

5 **A. It's not. It's selective.**

6 MR. PRIMIS: Your Honor, we did a

7 demonstrative. It's in tab 1. And to try to

8 make this easier -- I know it's hard to find

9 these demonstratives sometimes -- I have put

10 each demonstrative in its own tab. So

11 demonstrative 1 is tab 1.

12 SPECIAL MASTER LANCASTER: Thank you.

13 BY MR. PRIMIS:

14 **Q.** And, Dr. Zeng, can you just identify what the

15 three topics that you plan to cover in your

16 testimony today are.

17 **A. Yes. I would like to offer the Court my**

18 **knowledge in mostly three areas. The first one**

19 **is Georgia's consumptive use, and the second one**

20 **is the operation of the federal reservoirs in the**

21 **ACF Basin, and the third one is our analysis of**

22 **hydrologic changes in the basin.**

23 **Q.** Dr. Zeng, let's start with consumptive use which

24 we've got up there. We have heard a lot about

25 consumptive use. Mr. Qureshi asked you a few

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1 **seven people.**

2 **Q.** And you have a Ph.D., Dr. Zeng; is that right?

3 **A. That's correct.**

4 **Q.** How many other people in the hydrology unit at

5 Georgia EPD also have doctorate degrees?

6 **A. I have four other Ph.D. holders in my unit in the**

7 **areas of hydrology, civil engineering,**

8 **environmental engineering, and hydrogeology.**

9 **Q.** How would you describe the level of expertise and

10 technical knowledge of that group?

11 **A. This is a highly-trained, highly-professional**

12 **group.**

13 **Q.** What are your specific responsibilities as chief

14 hydrologist?

15 **A. My chief responsibility is to study anything that**

16 **has to do with hydrology, with managing of water**

17 **resources, and with the analysis of the Corps**

18 **operations of the reservoirs within the State of**

19 **Georgia.**

20 **Q.** Dr. Zeng, can you tell the Court where you got

21 your Ph.D. and what it's in?

22 **A. I received my Ph.D. degree back in 2000 from the**

23 **University of Georgia in forest resources but**

24 **focusing on hydrology and water resources.**

25 **Q.** Do you have any professional certifications?

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1 questions about it. How do you define

2 consumptive use as the chief hydrologist for

3 Georgia?

4 **A. Well, consumptive use in the basin really is the**

5 **amount of water that people remove from the**

6 **streams or the water bodies without returning**

7 **back. So -- so in that sense, it's a consumptive**

8 **loss.**

9 **Q.** Dr. Zeng, is consumptive use something Georgia

10 tracks in the ordinary course?

11 **A. That's correct.**

12 **Q.** Why do you do that?

13 **A. Well, we do that because consumptive use --**

14 **understanding of the amount of consumptive use is**

15 **the building block in understanding hydrology in**

16 **the basin and understanding how well we're**

17 **managing the resources. So that is the -- that**

18 **is the cornerstone of our understanding. So we**

19 **need to track that, and we do that.**

20 **Q.** As your position as chief hydrologist, do you

21 have confidence in Georgia's understanding of how

22 much consumptive use actually occurs on Georgia's

23 side of the basin?

24 **A. I do, very much.**

25 **Q.** How do you -- how does Georgia know how much

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1 consumptive use is occurring within its borders?

2 **A. Well, because we track hundreds of withdrawing**

3 **and returning facilities, these facilities report**

4 **their water use, both withdrawing activities and**

5 **discharging activities, to the agency on a**

6 **monthly basis. And also because we have an**

7 **agriculture metering program providing readings**

8 **from thousands of irrigation systems. And so we**

9 **have -- we have this data. We're very**

10 **comfortable, we're very confident that we have**

11 **captured the water use.**

12 **Q.** Let's talk about now the total amount of

13 consumption in Georgia because it's been a

14 hotly-disputed fact. And I want to get your

15 views as a Ph.D. hydrologist and the chief

16 hydrologist of Georgia. Did you put together a

17 demonstrative that shows your understanding of

18 Georgia's consumptive use?

19 **A. I did.**

20 MR. PRIMIS: Your Honor, we have that a

21 tab 2.

22 BY MR. PRIMIS:

23 **Q.** And, Dr. Zeng, can you explain what tab 2 shows.

24 **A. Yes. Tab 2 shows the annual average amount of**

25 **consumptive use that took place in the Georgia**

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1 **part of the ACF Basin from 1994 through 2013.**

2 **Q.** What are the green portions and the blue

3 portions?

4 **A. The blue portions represent municipal and**

5 **industrial consumptive use, while the green**

6 **portion represents the agricultural consumptive**

7 **use.**

8 **Q.** What does this chart tell us on an annual basis

9 about the magnitude of the consumption within

10 Georgia?

11 **A. This chart is telling us that outside the drought**

12 **years, the total amount of consumptive use on an**

13 **annual basis is around 500 cfs. And to put this**

14 **number in perspective, 500 cfs in comparison to**

15 **the long-term average state line flow of 21,000**

16 **cfs, 500 cfs is 2.5 percent.**

17 **Q.** And what about in the dry and drought years, what

18 does this show about consumptive use on an annual

19 basis?

20 **A. In the drought years, the total amount of annual**

21 **average consumptive use would be higher than the**

22 **normal levels; but they have never gone beyond**

23 **900 cfs on any average basis.**

24 **Now, we can still look at the 900 cfs with a**

25 **perspective of the long-term average. And 900**

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1 **cfs, when compared with the long-term average of**

2 **21,000 cfs, that is a percentage between 4 and 5.**

3 **Q.** Dr. Zeng, did you prepare another demonstrative

4 that -- and these are in your written testimony.

5 I just want you to explain them clearly for the

6 Court. Do you have a second demonstrative that

7 talks about the consumptive use in Georgia?

8 **A. Yes.**

9 **Q.** Can you turn to tab 3 of your book. This is

10 demonstrative 3 in our book and demonstrative 2

11 in your testimony.

12 Can you tell the Court what is depicted here?

13 **A. Yes. What is shown here is within the year, how**

14 **consumptive use, that takes place. Now, we**

15 **know -- we do know that especially for the**

16 **agricultural water use part, there's a**

17 **seasonality in it. So water use is higher in the**

18 **summer month but lower in the winter -- in the**

19 **winter -- in the colder month. There's also a**

20 **seasonality associated with municipal and**

21 **industrial water use, but not -- not so much as**

22 **the agricultural part.**

23 **Q.** Again, focusing on the magnitude, what does this

24 chart tell you about the magnitude of the

25 consumptive use within Georgia in the ACF on a

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1 monthly basis?

2 **A. Well, this is -- this is telling us that, for**

3 **example, the January water use, the January total**

4 **amount of consumptive water use is around 200**

5 **cfs. And, for example, the December number, the**

6 **consumptive use -- average consumptive use for**

7 **the month of December is lower than 400 cfs.**

8 **Now, there are a few months in the summertime**

9 **that do have higher monthly water use. But**

10 **they -- they have never gone beyond 1400 cfs.**

11 **Q.** Dr. Zeng, you've got these two bars, blue and

12 green. And can you just tell the Court how you

13 calculate or how you collect the data that allows

14 you to say what the blue means for M & I

15 consumptive use?

16 **A. The M & I, municipal and industrial, water use is**

17 **calculated by totaling all of the water use --**

18 **all of the withdrawals from the withdrawing**

19 **facilities, and then subtracting all of the**

20 **treated and return flow into the system. So the**

21 **difference between the two is the municipal and**

22 **the industrial consumptive use.**

23 **Q.** And how good is your data in terms of municipal

24 and industrial use?

25 **A. Our data are very comprehensive. They're all**

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1 **high quality.**

2 **Q.** Why?

3 **A. Well, because we keep tracking them; and we have**

4 **hundreds of systems reporting them. And we have**

5 **various programs in the agency that track them**

6 **and QA/QC them.**

7 **Q.** And, Dr. Zeng, can you describe at a high level

8 how you collect data to determine the green bar

9 for agricultural use?

10 **A. For agricultural water use, we have stated**

11 **earlier today, that we have the Ag metering**

12 **program. And the Ag metering program actually**

13 **collect data, the actual water use, from the**

14 **individual systems. Now, from the individual**

15 **systems we can know the average application**

16 **depth. That's the amount of water applied to**

17 **those systems and their corresponding acreage.**

18 **Then we can estimate with all the wetted acreage**

19 **what the total amount of water would be. So**

20 **that's the general process.**

21 **Q.** And, Dr. Zeng, just to put a point on it, why do

22 you believe Georgia's estimates for consumptive

23 use are correct, given all the numbers floating

24 around in this case?

25 **A. Well, we -- I believe this is correct because all**

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1 **Q.** What is the -- what is the highest amount that

2 Georgia -- that Florida has said Georgia has

3 consumed in terms of consumptive use of water?

4 **A. It looks like it's beyond 5,000 cfs.**

5 **Q.** How does that 5,000 compare with the numbers that

6 you believe Georgia actually uses?

7 **A. Well, in comparison to the average -- to the**

8 **average number that we use in a normal year,**

9 **that's 10 times as large as our number. In**

10 **comparison to the annual average drought year of**

11 **900, this is more than five times as much as what**

12 **we have collected in comparison even to the**

13 **monthly high, which was around 1800. This would**

14 **be three times as much.**

15 **Q.** Dr. Zeng, without -- this was a subject of some

16 of the other expert testimony; but from your

17 perspective as Georgia's chief hydrologist, can

18 you just explain to the Court why you believe

19 that a high level -- why this number is so much

20 higher than what Georgia estimates?

21 **A. Right. I believe there were several reasons for**

22 **these numbers to be extremely high. For example,**

23 **the inclusion of the aquifers that do not**

24 **connect, that are not connected with the streams;**

25 **that's one. And then the fact that groundwater**

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1 **of these data were collected from thousands of**

2 **facilities and instances in the -- across these**

3 **months and years. It's based on -- it's based on**

4 **instrumentation, measurements by instrumentation**

5 **from all these facilities.**

6 **Q.** Dr. Zeng, do you know that -- I think you do know

7 that in this case Florida has put forward its own

8 estimates of Georgia's consumptive use. Correct?

9 **A. I'm aware of that, yes.**

10 **Q.** And have you actually read the work that was done

11 by Florida and its experts to make those

12 determinations?

13 **A. I have.**

14 **Q.** Let me show you a slide. It's the next tab.

15 It's tab 4. So Zeng demonstrative 4. And this

16 was a slide that was used in Florida's opening

17 statement. And the header for this slide says,

18 even using extremely conservative assumptions --

19 not just conservation, extremely conservative --

20 there is no doubt that Georgia's upstream

21 consumptive use of water has exploded since the

22 1970's.

23 And do you believe that these estimates here

24 are extremely conservative, sir?

25 **A. No.**

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1 **pumping, even from the connected aquifer, was**

2 **counted as one-on-one -- one-to-one reduction in**

3 **streamflow, which is not supported by scientific**

4 **evidence. And then there is also double-counting**

5 **in Florida's methodology.**

6 **Q.** Dr. Zeng, is it even possible for Georgia to

7 consume as much water as Florida is suggesting,

8 as high as 5,000 cfs?

9 **A. It's not -- it's not possible.**

10 **Q.** Have you seen in this case any estimates by

11 Florida of how much 5,000 cfs could support in

12 terms of water use?

13 **A. I have come across a demonstrative from Florida.**

14 **Q.** Okay. Let me turn you to the next tab. And this

15 is tab 5. And what we have at tab 5 is a

16 demonstrative that Florida created and used in an

17 expert deposition. I believe it was

18 Mr. Singarella. And they have actually made it

19 an exhibit in the case. They have it on their

20 exhibit list, FX-518. Can you explain to the

21 Court what Florida is saying about the impact of

22 5,000 cfs consumptive use?

23 **A. It looks like Florida is saying that 5,000 cfs**

24 **is enough to support the drinking water of 19**

25 **million people, at the same time to support**

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1 **farming irrigation of close to 4 million acres of**
 2 **land.**
 3 **Q.** Dr. Zeng, does Georgia have 19 million people and
 4 4 million irrigated acres in the ACF Basin?
 5 **A. Nowhere near that.**
 6 **Q.** And are you aware that Dr. Sunding, Florida's
 7 economist who was here and testified last week,
 8 he's proposed certain options or scenarios, he
 9 calls, that he said could generate up to 2,000
 10 cfs in peak streamflow periods? Are you aware of
 11 that?
 12 **A. I'm aware of that, yes.**
 13 **Q.** What would happen if the Court were to order --
 14 say, Sunding, let's do this 2,000 scenario. What
 15 would be the practical impact of that on Georgia?
 16 Could it even be accomplished?
 17 **A. It just cannot be physically accomplished because**
 18 **that number is more than our total consumptive**
 19 **use.**
 20 **Q.** Well, he also had a 1500 cfs option -- a mixture
 21 of options at 15. What would happen if that were
 22 ordered; could Georgia deliver that in the middle
 23 of a severe drought?
 24 **A. Well, 1500 is a -- it's over 80 percent of our**
 25 **highest monthly consumptive use.**

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1 **Q.** 15 or -- I'm talking about 1500 now.
 2 **A. Yes. 1500 is over 80 percent of the highest**
 3 **monthly water use that we have. So it -- I don't**
 4 **believe it's practical.**
 5 **Q.** Now -- and, Dr. Zeng, we're going to come back to
 6 this. But let's say we cut almost all of
 7 Georgia's water use, as Dr. Sunding would have
 8 the Court do. Where would -- whatever water
 9 happened to get saved at whatever level, where
 10 would that go in the middle of a severe drought?
 11 **A. In the middle of a severe drought, that water**
 12 **certainly would flow down the river and**
 13 **ultimately into Lake Seminole. But then does it**
 14 **flow across the state line? That depends on what**
 15 **the Corps does on the Chattahoochee side.**
 16 **So under a low flow or drought operation**
 17 **where the Corps is operating to provide 5,000 cfs**
 18 **into the Apalachicola River, the Corps will**
 19 **simply reduce the release from the upstream**
 20 **reservoirs on the Chattahoochee branch. In**
 21 **effect, the two branches of the river would**
 22 **provide the same amount of water, 5,000 cfs, for**
 23 **that project to provide 5,000 cfs into Florida.**
 24 **Q.** Okay. I don't want to get ahead. That's our
 25 second topic, so we'll come back to that in more

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1 detail.
 2 But coming back to the consumptive use data,
 3 does Georgia actually use or rely on this data
 4 that you put together?
 5 **A. Yes.**
 6 **Q.** How?
 7 **A. Georgia uses this data to evaluate its management**
 8 **of the resources -- of water resources. Georgia**
 9 **used this data to do its state and regional water**
 10 **planning. Georgia used this data to communicate**
 11 **with the Army Corps of Engineers to help them**
 12 **manage the river reservoir system. Georgia**
 13 **provides this data to the U.S. Geological Survey**
 14 **for their five-year state water use reports and**
 15 **Georgia provides this data to the ACF Stakeholder**
 16 **Group for their modeling and for their developing**
 17 **the Sustainable Water Management Plan.**
 18 **Q.** Dr. Zeng, you said that you share your data with
 19 the Army Corps and with the United States
 20 Geological Survey, both federal agencies;
 21 correct?
 22 **A. Correct.**
 23 **Q.** And has either of those agencies or any of their
 24 personnel ever come to you and said, your
 25 consumptive use looks like it's about 2-1/2 times

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1 too low?
 2 **A. No.**
 3 **Q.** Has anybody ever come to you with the types of
 4 numbers that Florida has proposed in this case
 5 and said, you guys are way off; this is where you
 6 really are?
 7 **A. No.**
 8 **Q.** And has Florida presented you, as the chief
 9 hydrologist with a Ph.D. in hydrology, with any
 10 information that causes you to say, you know
 11 what, I think our numbers are just wrong; and we
 12 have to go redo them all?
 13 **A. No.**
 14 **Q.** You said you're familiar with the ACF Stakeholders?
 15 **A. That's correct.**
 16 **Q.** Okay. And that's a group we discussed quite a
 17 bit here in court. I think you know that?
 18 **A. Yes.**
 19 MR. PRIMIS: Your Honor, we have the
 20 Sustainable Water Management Plan, GX-1325 at
 21 tab 15; but I believe the Court has its own
 22 copy. But if you don't have it handy, you
 23 can go to tab 15.
 24 BY MR. PRIMIS:
 25 **Q.** And, Dr. Zeng, I want to start in that document

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1 at page 2.

2 **A. The summary, page 2?**

3 **Q.** Page 2. It's the section called Development of

4 The Plan in the first paragraph.

5 **A. Yes.**

6 **Q.** And can you read that starting where it says,

7 ACFS worked closely -- read it to yourself; and

8 then I'm going to ask you a question about it, in

9 particular the first sentence.

10 **A. Yes.**

11 **Q.** So what do you understand ACFS to be saying here

12 when it said that they worked with state and

13 federal agencies to compile the best available

14 water withdrawals and return data?

15 **A. I believe that statement certainly describes the**

16 **data that we provided them.**

17 **Q.** So they actually asked you for data?

18 **A. That's correct.**

19 **Q.** And Georgia provided it?

20 **A. That's correct.**

21 **Q.** Now, did ACFS present its own estimates of

22 Georgia's consumptive use in this document?

23 **A. I believe they did for the basin, not just**

24 **Georgia.**

25 **Q.** Can you turn to page 28. That's GX-1325.

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1 the unimpaired flow dataset. Do you remember

2 that?

3 **A. Yes.**

4 **Q.** And recall it was -- there was a 2012 report --

5 and it's in the binder that you were presented

6 with -- from a Dr. Georgakakos. Right?

7 **A. Yes.**

8 **Q.** From Georgia Tech. Right?

9 **A. Yes.**

10 **Q.** And I think it's important because I don't think

11 the questions were always clearly delineated. Is

12 there a difference between unimpaired flow data

13 and your consumptive use data?

14 **A. There certainly is a difference.**

15 **Q.** Can you explain that?

16 **A. Yes. The water use data is basically as we**

17 **presented. It's the Georgia part of the**

18 **consumptive water use, municipal, industrial,**

19 **agricultural. The unimpaired flow data is**

20 **synthetic data that takes the water use data**

21 **back. So the unimpaired -- the term unimpaired**

22 **means this is an attempt to get to what Mother**

23 **Nature has provided. So that's -- in that sense,**

24 **it's called unimpaired. So the water use data is**

25 **incorporated into the unimpaired flow data. And**

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1 **A. Yes.**

2 **Q.** Okay. There's a map here on page 28. Do you see

3 that?

4 **A. Yes.**

5 **Q.** And can you describe what appears in this map.

6 **A. The map is showing different parts of the basin.**

7 **And it also showed the water use that takes place**

8 **in different portions of the basin. And they**

9 **presented this in a graphic format showing the**

10 **monthly water use by different regions and also**

11 **by different sectors.**

12 **Q.** Now, the numbers that ACFS reports as the numbers

13 that it utilized in trying to develop the best

14 information, how did they compare to Georgia's

15 estimates of its own consumptive use?

16 **A. They are very close to Georgia's numbers.**

17 **Q.** Are the ACFS numbers anywhere near what Florida

18 has said gets consumed in this basin?

19 **A. No.**

20 **Q.** Now, we --

21 MR. PRIMIS: I think I have one more

22 brief topic. I can finish up before lunch

23 and it's, I think, related.

24 BY MR. PRIMIS:

25 **Q.** We talked with Mr. Qureshi about what's called

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1 **the criticism was on the unimpaired flow data,**

2 **not exactly on Georgia's water use data.**

3 **Q.** And Dr. Georgakakos said he wrote that report for

4 the ACFS group. Right?

5 **A. Yes.**

6 **Q.** And was there a disclaimer -- we talked about

7 this with Mr. Turner; but are you aware that

8 there is a disclaimer in that document?

9 **A. Yes.**

10 **Q.** Okay. Now, have you had an opportunity to

11 consider Dr. Georgakakos's criticisms of the UIF,

12 unimpaired flow, dataset?

13 **A. I have.**

14 **Q.** Well, what's your view?

15 **A. Well, I think what he was saying in that report**

16 **was there are places where the dataset can be**

17 **improved. That's what I take. And I also think**

18 **that his criticism of the places where**

19 **improvement can be made, those issues are minor.**

20 **They are -- they don't affect the use of the**

21 **unimpaired flow for the purpose that the Corps**

22 **would use it, for the purpose that we would use**

23 **it.**

24 **Q.** Now, Dr. Zeng, Dr. -- just to get the procedure

25 correct, Dr. Georgakakos provided that report to

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1 the ACFS Stakeholders Group. Correct?

2 **A. Correct.**

3 **Q.** And three years later when the ACFS Stakeholders

4 published GX-1325, the Sustainable Water

5 Management Plan, what dataset did they use to

6 evaluate water use in the basin?

7 **A. The -- well, water use, it was based on --**

8 **Q.** I'm sorry. What did they -- did they use the

9 unimpaired flow dataset to evaluate modeling in

10 the basin?

11 **A. They did.**

12 **Q.** And which model did they use?

13 **A. They used ResSim.**

14 **Q.** Is that the Army Corps' model?

15 **A. That's correct.**

16 **Q.** And have you seen any testimony in this case

17 about what Dr. Georgakakos and his colleague

18 Dr. Kistenmacher said about whether it's

19 appropriate to use the unimpaired flow dataset

20 for modeling?

21 **A. I have.**

22 **Q.** And what did they say?

23 **A. They said for the purpose of comparing**

24 **alternatives in operation and alternatives in**

25 **management, it's appropriate to use the**

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1 **unimpaired flow data.**

2 **Q.** One last point, Dr. Zeng. You were also asked

3 about small impoundments. Do you remember that?

4 **A. Yes.**

5 **Q.** And these are those small farm ponds potentially

6 that exist in the basin?

7 **A. That's correct.**

8 **Q.** Why doesn't Georgia EPD include evaporation from

9 those small impoundments in its consumptive use

10 estimates?

11 **A. Well, there are several reasons. The small**

12 **impoundment, it collects water; and it evaporates**

13 **water at different times of the year. And also,**

14 **the impoundment actually provides data -- it**

15 **shifts the timing of the water. So it collects**

16 **water in the wetter part of the year and puts**

17 **water in the storage for use in the drier part of**

18 **the year. So in a sense, this is like a**

19 **reservoir. It changes the timing and actually**

20 **reduces the summertime streamflow reduction.**

21 **So the farmers use the storage, and that**

22 **actually reduces the streamflow depletion during**

23 **summertime.**

24 **Q.** Is that another way of saying these impoundments

25 actually add water available for irrigation?

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1 **A. That's correct.**

2 **Q.** And does the Army Corps use this evaporation from

3 small impoundments in its estimates?

4 **A. They don't.**

5 **Q.** Last topic, Dr. Zeng, before lunch. Do factors

6 other than Georgia's consumptive use affect the

7 amount of streamflow in the ACF Basin?

8 **A. Yes.**

9 **Q.** What types of things affect streamflow?

10 **A. The amount of rainfall that falls in the basin,**

11 **the pattern with which it falls, and the Corps'**

12 **operation of the facilities, and issues like the**

13 **incremental flow within Florida that's been**

14 **declining in the past 40 years. All these**

15 **factors would affect streamflow in different**

16 **ways.**

17 **Q.** Would the back-to-back nature of a drought --

18 consecutive years of drought also affect

19 streamflow?

20 **A. Absolutely, yes.**

21 **Q.** Dr. Zeng, is Georgia's consumptive use in your

22 view a major factor affecting state line flow

23 into Florida?

24 **A. It's not.**

25 **Q.** What do you believe is the most important factor?

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1 **A. That would be the Army Corps of Engineers'**

2 **operation of the system.**

3 **Q.** And what about in dry years; is that the case?

4 **A. In dry years that's absolutely the case.**

5 **Q.** And what about in wet years?

6 **A. In wet years it matters less because we all know**

7 **in wet years the percentage of Georgia's water**

8 **use is even smaller in comparison to the wet year**

9 **type of flow.**

10 MR. PRIMIS: This is probably a good

11 place to break for lunch, if it's okay.

12 SPECIAL MASTER LANCASTER: Thank you.

13 We'll be in recess.

14 (Time Noted: 11:52 a.m.)

15 (Recess Called)

16 (Time Noted: 12:54 a.m.)

17 MR. PRIMIS: Good afternoon, your Honor.

18 BY MR. PRIMIS:

19 **Q.** Good afternoon, Dr. Zeng.

20 **A. Good afternoon.**

21 **Q.** Dr. Zeng, I want to turn now to the second

22 category of your testimony and talk about the

23 role of the federal reservoir system in the ACF

24 Basin. Okay?

25 **A. Yes.**

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1 **Q.** The Corps has come up a number of times
 2 throughout the proceedings here. Can you tell
 3 us; do you have firsthand knowledge of Corps
 4 operations in the ACF Basin?
 5 **A. Yes.**
 6 **Q.** Can you describe that for the Court.
 7 **A. Yes. Through the years that I was with EPD, I**
 8 **have worked with the Corps in its operation of**
 9 **the federal reservoirs in the system. And myself**
 10 **and my staff, we were trained by the Corps to**
 11 **understand their operations and also to**
 12 **understand how to use the model to simulate their**
 13 **operations.**
 14 **And I have had numerous exchanges with the**
 15 **Corps staff discussing specific aspects of the**
 16 **reservoir operations. In fact, we and other**
 17 **stakeholders provided the Corps with the input on**
 18 **how they would shape their operation plans.**
 19 **Q.** Dr. Zeng, I was just going to ask you why do the
 20 state and federal governments coordinate on water
 21 resource management in the basin?
 22 **A. Right. The federal reservoirs belong, and**
 23 **they're operated by a federal agency here, the**
 24 **Army Corps of Engineers. But the water -- the**
 25 **water is state water. And so the state has an**

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1 **Statement.**
 2 **Q.** Dr. Zeng, is that a thorough document?
 3 **A. It is. It is a 4,000, 5,000 page document.**
 4 **Q.** Right. We have it here in the courtroom. It's
 5 four binders double-sided. Does that sound
 6 right?
 7 **A. Yes.**
 8 **Q.** Okay. Does -- can you describe the process that
 9 the Corps goes through to put together that four
 10 to 5,000-page operating manual and environmental
 11 impact statement?
 12 **A. Yes. The Corps started this process by working**
 13 **with the stakeholders, different states,**
 14 **different interests across the basin, collect**
 15 **their comments, their scoping comments and other**
 16 **comments, and then formulate different**
 17 **operational alternatives, how to operate the**
 18 **reservoirs appropriately to meet authorized**
 19 **purposes. They also analyzed the water supply**
 20 **scenarios, different ones, how do you evaluate**
 21 **those and what are the impacts of those. And**
 22 **then they did a very thorough technical analysis.**
 23 **And they documented the analysis in the document**
 24 **that we're talking about.**
 25 **Q.** What role does U.S. Fish and Wildlife play in

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1 **interest in understanding how the Corps operates**
 2 **the system because that affects the state. And**
 3 **also, for example, Lake Lanier is the major water**
 4 **supply source to the metro Atlanta area. So the**
 5 **state has a high interest in how the system --**
 6 **how the federal reservoirs are operated by this**
 7 **federal agency.**
 8 **Q.** You mentioned that there were rules that govern
 9 Corps operations. Right?
 10 **A. That's correct.**
 11 **Q.** And are you familiar with those?
 12 **A. I'm very familiar with those.**
 13 **Q.** Who does Georgia rely on to understand and advise
 14 the state on the operation of the Army Corps'
 15 rules?
 16 **A. That would be myself and my staff.**
 17 **Q.** Now, is there a set of documents that governs
 18 what the Corps does and how it operates in the
 19 basin?
 20 **A. Yes.**
 21 **Q.** Can you describe what those documents are.
 22 **A. The most comprehensive one would be the one that**
 23 **the Corps published in October of 2015. And this**
 24 **is the Army Corps of Engineers Water Control**
 25 **Manual and the Draft Environmental Impact**

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1 this Army Corps manual update process?
 2 **A. When the Corps developed the so-called preferred**
 3 **action alternative, this is the one that they**
 4 **recommend to be adopted as the new Water Control**
 5 **Manual. They would seek a formal consultation**
 6 **with the U.S. Fish and Wildlife Service. And the**
 7 **Service would look at the alternative and then**
 8 **make a determination of whether or not the plan**
 9 **would -- would have an impact on the endangered**
 10 **species.**
 11 **Q.** Is that called a biological opinion?
 12 **A. That's correct.**
 13 **Q.** Okay. Now, we have had a lot of biological
 14 opinions in the courtroom; and I'm not going to
 15 reintroduce them here. But is there just one
 16 biological opinion, or have there been multiple?
 17 **A. There are multiple versions of them.**
 18 **Q.** Are you familiar with the current operating rules
 19 for the Revised Interim Operating Plan?
 20 **A. I am, yes.**
 21 **Q.** And did Fish and Wildlife issue a biological
 22 opinion on that plan?
 23 **A. They issued two, one in 2008 and another one in**
 24 **2012.**
 25 **Q.** And what did Fish and Wildlife say about the

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1 RIOP?

2 **A. Well, they concluded that the operation as the**

3 **Corps put forward does not jeopardize the**

4 **continued existence of the species and that the**

5 **plan the Corps has does not adversely impact the**

6 **designated critical habitat.**

7 **Q.** And with regard to the DEIS that we have seen

8 from 2015, is there a biological opinion

9 associated with that one?

10 **A. There is one, yes.**

11 **Q.** And when did that come out?

12 **A. That came out, I think, a month ago or a couple**

13 **of months ago.**

14 **Q.** Did that reach the same conclusion as prior

15 biological opinions?

16 **A. It did.**

17 **Q.** Now, Dr. Zeng, I want to put up a demonstrative

18 of a map of the basin. It's tab 6 in the book.

19 And Dr. Shanahan was here, and he talked through

20 this map to some extent. But as the chief

21 hydrologist who has been working on this basin

22 for 16 years, can I ask you if you would describe

23 to the Court where the reservoirs are and how you

24 view their operations.

25 MR. PRIMIS: And, your Honor, I think it

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1 **And along the Chattahoochee River, there is a**

2 **series of federal reservoirs starting with the**

3 **most upstream one which can -- which happens to**

4 **be the one owning the largest amount of storage,**

5 **about two-thirds of the storage in the basin.**

6 **And that's in Lake Lanier. Coming down, further**

7 **downstream, there's the metro Atlanta area in**

8 **between -- between Lake Lanier and the next one,**

9 **which is Lake West Point. And West Point here**

10 **and Walter F. George here, they combine -- they**

11 **have one-third of the system's storage. And**

12 **George Andrews is just a lock and dam. So it**

13 **doesn't have meaningful storage. And Jim**

14 **Woodruff here that impounded Lake Seminole, it**

15 **has limited amount of storage; and it regulates**

16 **flow into Florida.**

17 **So a decision about the Corps flow is made at**

18 **this project. And that project determines how**

19 **much flow goes into the Apalachicola River.**

20 **Q.** Okay. Dr. Zeng, the -- there's been testimony

21 that there are specially authorized purposes for

22 these reservoirs and dams. Can you explain that?

23 **A. Specially authorized --**

24 **Q.** What are the Congressionally-authorized purposes

25 for these aquifers?

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1 might be easiest for Dr. Zeng to go to the map.

2 SPECIAL MASTER LANCASTER: Fine.

3 MR. PRIMIS: And we, hopefully, have him

4 miked up so he can be heard over there.

5 THE WITNESS: I'll try.

6 **A. Do you have the pointer?**

7 **Q.** Just keep your voice up.

8 THE WITNESS: Your Honor, can you hear

9 me?

10 BY MR. PRIMIS:

11 **Q.** Okay. Dr. Zeng, can you describe how the

12 reservoirs work together on this map.

13 **A. Yes. Here is a schematic, a map of the basin.**

14 **And the blue lines here represent the rivers, and**

15 **the blue globs here represent the reservoirs. So**

16 **if we look at the western part of the basin, that**

17 **is the Chattahoochee River that flows down here,**

18 **forms the state line between Georgia and Alabama,**

19 **continues to flow down. And then at the Jim**

20 **Woodruff project, there is the state line between**

21 **Georgia and Florida. There is the state line**

22 **between Alabama and Florida. And then this one**

23 **on the eastern part, this is the Flint River that**

24 **flows into the Lake Seminole that is impounded by**

25 **the Jim Woodruff Dam.**

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1 **A. Right, right. These projects serve a number of**

2 **Congressionally-authorized purposes. And these**

3 **purposes include flood control, water supply,**

4 **water quality, navigation, recreation, and fish**

5 **and wildlife conservation.**

6 **Q.** And hydropower, too?

7 **A. And hydropower generation.**

8 **Q.** Okay. So how does the Corps figure out when it

9 operates these reservoirs what purpose it will

10 serve at any given point in time?

11 **A. There is a complicated set of rules determining**

12 **what kind of flow is released into the**

13 **Apalachicola River and what kind of flow support**

14 **is provided from -- from the upstream reservoirs**

15 **all the way down to Jim Woodruff. So there's a**

16 **set of rules.**

17 **Q.** Dr. Zeng, we'll come to those rules in a moment.

18 But I just want to ask you first, are the

19 reservoirs operated as independent facilities or

20 do they work together?

21 **A. They are operated as an integrated system. The**

22 **Corps would use a word that's called a tandem**

23 **operation. A tandem operation means a lower**

24 **reservoir makes releases, but then it is**

25 **supported in turn by the releases from its**

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1 **immediate upstream reservoir. And that one is in**
 2 **turn supported by the one upstream of it. So**
 3 **that's called a tandem operation.**
 4 **Q.** Now, when you say supported by releases, what
 5 does that mean?
 6 **A. That means all the storage in the basin is**
 7 **treated as one. It's treated as one. And then**
 8 **when the lower projects are short of water, it is**
 9 **supported by releases or replenishment from**
 10 **upstream projects.**
 11 **Q.** Okay. Dr. Zeng, I would now like to focus on a
 12 single reservoir and have you explain to the
 13 Court how the Army Corps views a single
 14 stand-alone reservoir.
 15 And we have a demonstrative at tab 7. We can
 16 put it on the screen. And this comes right from
 17 JX-124, which is the Draft Environmental Impact
 18 Statement at page 2-28.
 19 And, Dr. Zeng, can you explain how the Corps
 20 divides up these reservoirs?
 21 **A. Yes. Here is a typical schematic of a reservoir**
 22 **and the storage behind the dam. So this -- that**
 23 **darker part represents the dam itself.**
 24 **Now, the water stored behind the dam, the**
 25 **Corps puts them into three different layers.**

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1 **rainfall and high flood coming into the system,**
 2 **the system can then temporarily put that water in**
 3 **the flood control storage so that the Corps does**
 4 **not inundate and flood downstream entities.**
 5 **That's flood control.**
 6 **Q.** Now, Dr. Zeng, I want to focus specifically on
 7 conservation storage, which you said is used for
 8 the Congressionally-authorized purposes.
 9 Correct?
 10 **A. That's right.**
 11 **Q.** Does the Corps have rules that it uses to figure
 12 out when to release and when to store water in
 13 conservation storage?
 14 **A. Yes, the Corps does.**
 15 **Q.** Okay. Let's turn to the next demonstrative,
 16 tab 8. And this, again, is another diagram from
 17 the Draft Environmental Impact Statement from the
 18 Corps, JX-124, at page 2-35. And can you explain
 19 to the Court what this chart shows?
 20 **A. Yes. Let's focus on the flat part of the curve.**
 21 **The very bottom one is the one that we just saw.**
 22 **This is the bottom of conservation pool, and**
 23 **below it is the inactive. But we're talking**
 24 **about just the conservation pool itself here.**
 25 **And so if we look at the top of it, there's**

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1 **This lowest layer here is called the inactive**
 2 **storage. By the name itself, I think it's not**
 3 **hard to know the meaning of it. This -- this**
 4 **amount of water is inactive. It is not used in**
 5 **meaningful ways in the Corps day-to-day**
 6 **operation.**
 7 **And above that there is another layer, and**
 8 **this layer here is called the conservation**
 9 **storage. A conservation storage contains the**
 10 **amount of water that the Corps works on a**
 11 **day-to-day basis to meet all of the purposes --**
 12 **all of the Congressionally-authorized purposes**
 13 **except flood control -- except flood control. So**
 14 **if we need to generate power, the water comes**
 15 **from conservation storage. If we need to support**
 16 **a downstream flow target for water quality**
 17 **purposes or for water supply purposes, that water**
 18 **comes from here. If there's water going into**
 19 **Florida, that water comes from here. And**
 20 **that's -- so that's basically how much water the**
 21 **Corps has to work with.**
 22 **Q.** Okay. What's the top layer, flood storage, for?
 23 **A. The top layer here is the space above**
 24 **conservation storage. Now, the purpose of that**
 25 **is to leave that empty. And in the cases of high**

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1 **the title that says Top of Conservation Pool.**
 2 **This is the top of the storage that the Corps has**
 3 **to work with. And between the top of**
 4 **conservation and the bottom of conservation, the**
 5 **Corps made a division of the conservation**
 6 **storage. They made zones. They made action**
 7 **zones. And when the elevation or the storage is**
 8 **within each zone, the Corps has a somewhat**
 9 **different operation to go with it. And if**
 10 **they're in zone 1, that means the reservoir**
 11 **system is healthy. There is plenty of storage.**
 12 **The Corps can afford to have more aggressive**
 13 **operations, meaning release more for storage. As**
 14 **the storage declines from zone 1 into zone 2 or**
 15 **3, the Corps operation turns to more and more**
 16 **conservative, meaning they tend to store more.**
 17 **They tend to release less. When they get into**
 18 **zone 4, they will implement an operation that is**
 19 **called a drought operation. So once the Corps is**
 20 **in drought operation, the only flow that the**
 21 **Corps is required to release into Florida into**
 22 **the Apalachicola River would be the 5,000 cfs.**
 23 **Q.** And I think it's clear from your description, but
 24 just to make sure I've got it, when the
 25 reservoirs are full, they're in zone 1. And the

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1 Army Corps can address all purposes; is that
 2 right?
 3 **A. That's correct.**
 4 **Q.** And in a drought, as the reservoir goes down and
 5 that conservation pool declines, you end up in
 6 zone 4 where they get more conservative and
 7 target the 5,000 at the state line?
 8 **A. That's correct.**
 9 **Q.** Now, are there -- this gets complicated; but are
 10 there then rules for how the Corps operates
 11 within each of those zones?
 12 **A. Yes.**
 13 **Q.** Okay. And I will -- this is -- I want to do this
 14 at a high level. But let's go to tab 8 -- I'm
 15 sorry -- tab 9, which is again another chart from
 16 the Army Corps' DEIS, JX-124. And this one comes
 17 from page 2-71. And I -- can you just explain
 18 what the title of this chart is?
 19 And then I think maybe the easiest way to
 20 describe it is to go by columns, but I'll defer
 21 to you because you're much more familiar. I do
 22 ask you though to keep it at a level where the
 23 rest of us in the room can understand it.
 24 **A. Right. Right.**
 25 **So this is the table that the Corps has for**
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1 **the minimum discharge from Woodruff Lock and Dam**
 2 **by month and by based on inflow. So what this**
 3 **chart does is to place the Corps -- on an**
 4 **everyday basis it places the Corps on exact**
 5 **location in this table so they can decide on that**
 6 **day what to release.**
 7 **Now, the factors that they consider**
 8 **include -- the first is what I call seasonality.**
 9 **I think they called it seasonality. Here the**
 10 **first column they title that as month. So that**
 11 **represents the seasonality. And then the second**
 12 **column is called the Conservation Storage Zone.**
 13 **This is when they look at the reservoirs; and**
 14 **they say, how much storage do we have? Are we in**
 15 **zone 1 or 2 or 3 or 4? That's the storage that**
 16 **they look at.**
 17 **And then the third column says Basin Inflow.**
 18 **Now, this is the amount of water that comes into**
 19 **the basin, comes into each one of the Corps**
 20 **reservoirs. This is how much water the Corps has**
 21 **to work with on the daily basis.**
 22 **So in combination of these three factors, the**
 23 **Corps, then they place themselves into one of**
 24 **these cells or one of these lines; and that tells**
 25 **them what to release.**
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1 **Q.** And then that -- the fourth column, which shows
 2 the release, which would occur at a particular
 3 time of year and a particular zone depending on
 4 how much, say, rain there is in the system?
 5 **A. That's correct.**
 6 **Q.** Now, you mentioned zone 4 was drought operations.
 7 **A. Yes.**
 8 **Q.** And can you -- and is there also dry or low flow
 9 conditions?
 10 **A. Yes.**
 11 **Q.** Can you describe the difference between low flow
 12 and drought and show where on the chart --
 13 **A. Yes.**
 14 **Q.** -- the Army Corps would look in that situation?
 15 **A. Yes. There is a role that represents the drought**
 16 **operations. So if you look at the first column**
 17 **title that says At All Times, just below the**
 18 **December to February, and the second column says**
 19 **here zone 4, that is the drought operation that**
 20 **the Corps undertakes when they have their storage**
 21 **into the lowest layer. And when you look toward**
 22 **the operational, the release, the Corps**
 23 **defines -- it says 5,000 here. And then if you**
 24 **look at the fifth column which says how many you**
 25 **can store, and then it says up to 100 percent of**
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1 **basin inflow above 5,000.**
 2 **So what this means is that when the Corps is**
 3 **in drought operation, the Corps can put every**
 4 **drop of water above 5,000 into storage to recover**
 5 **from the drought conditions.**
 6 **Q.** And what will the flow into Florida be at that
 7 point in time?
 8 **A. That would be 5,000 cfs.**
 9 **Q.** When does the Corps move to a position where it
 10 will release more than 5,000 and go back to more
 11 normal operations?
 12 **A. That would be when the Corps suspends its drought**
 13 **operation, and that would be when the entire**
 14 **system storage goes back from zone 4 all the way**
 15 **to recovering to zone 1.**
 16 **Q.** Is it possible to end up at 5,000 cfs even if
 17 you're not in drought operation?
 18 **A. That's possible, yes.**
 19 **Q.** Okay. Can you explain that?
 20 **A. Yes. There is what I call the low flow**
 21 **operation. So even if you are not in the drought**
 22 **operation, if you have low basin inflow -- so in**
 23 **each category under the basin inflow column, we**
 24 **see a division that's called less than 5,000,**
 25 **less than 5,000, less than 5,000, and less than**
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1 **5,000. So in the different seasonality even in**
 2 **the higher zones when basin inflow -- when basin**
 3 **inflow is below 5,000, the Corps is required to**
 4 **release 5,000 cfs, 5,000 cfs, 5,000 cfs. This is**
 5 **the low flow operation. Under a low flow**
 6 **operation the Corps is required to release only**
 7 **5,000 cfs.**
 8 **Q.** Dr. Zeng, have you in your experience actually
 9 observed the Corps go into drought operations?
 10 **A. I have, yes.**
 11 **Q.** And can -- would it help to explain how it works
 12 if we show another chart?
 13 **A. Yes, please.**
 14 **Q.** Okay. Let's go to tab 10, which is demonstrative
 15 10; and the data here represented comes from
 16 GX-143. And, Dr. Zeng, can you explain to the
 17 Court what is on this chart behind tab 10?
 18 **A. Right. This is what we call a hydrograph, and**
 19 **it depicts the flow that actually went across**
 20 **the state line in the year of 2012 starting**
 21 **January 1, 2012, all the way through December 31,**
 22 **2012. So what is shown here that -- this blue**
 23 **curve shows the amount of flow that goes through**
 24 **the state line and flowing into the Apalachicola**
 25 **River.**

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1 drought operations?
 2 **A. 5,000 cfs.**
 3 **Q.** Now, how long can drought operations last?
 4 **A. In this -- in this instance, the drought**
 5 **operation lasted from May of 2012, I believe,**
 6 **through March of 2013.**
 7 **Q.** And what happened in March of 2013 that caused it
 8 to go out of drought operations?
 9 **A. In March 2013 the system recovered to zone 1. So**
 10 **the entire reservoir system became healthy again,**
 11 **and the Corps suspended its drought operations.**
 12 **Q.** Now, Dr. Zeng, if more flow comes into the
 13 reservoir system when the system is in drought
 14 operations or that low flow condition you
 15 described, does that extra water go downstream to
 16 Florida or does it go into storage?
 17 **A. It goes into storage.**
 18 **Q.** And why is that?
 19 **A. Well, because the Corps -- according to the**
 20 **drought operation rule, the Corps needs only to**
 21 **release 5,000 cfs; and the Corps can put every**
 22 **drop of water above 5,000 into storage to recover**
 23 **storage.**
 24 **Q.** Florida has contended that if Georgia would
 25 simply reduce its consumption in drought, all

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1 **So what is shown here is after the spring of**
 2 **2012, the Corps went into drought operation. The**
 3 **Corps started drought operation. They declared**
 4 **that they would be operating under the drought**
 5 **operation May the 1st. So they made that**
 6 **determination, and they made releases after that**
 7 **point to be very close to 5,000 throughout the**
 8 **rest of 2012.**
 9 **Q.** Dr. Zeng, there are some small bumps up in the
 10 August and September time frame. Do you see
 11 those?
 12 **A. Yes.**
 13 **Q.** Can you explain what those are?
 14 **A. Yes. Every now and then there are local**
 15 **rainstorms, local rainstorms that bring**
 16 **unexpected water that would raise the elevation**
 17 **in Jim Woodruff Dam. And the Corps have safety**
 18 **considerations. The Corps has safety rules that**
 19 **require that they release more water to bring up**
 20 **the tailwater elevation so that dam safety can be**
 21 **maintained.**
 22 **Q.** Now --
 23 **A. Those events represent that condition.**
 24 **Q.** And absent those kinds of conditions, what is the
 25 approximate flow across the state line during

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1 that extra water that is conserved would pass
 2 through to Florida. Is that -- is that your
 3 view?
 4 **A. That's not true.**
 5 **Q.** And what would actually happen?
 6 **A. What would happen is the Corps would put that**
 7 **extra water into storage and replenish storage**
 8 **during the drought operation.**
 9 **Q.** Another argument that's been made is that Lake
 10 Seminole is just a pass-through facility and that
 11 its run-of-river. Why doesn't that mean that
 12 conserved water just always passes through to
 13 Florida?
 14 **A. Well, the water coming into Jim Woodruff is from**
 15 **two sources. One is the Flint. The other one is**
 16 **from the Chattahoochee, which is supported --**
 17 **directly supported by releases from upstream**
 18 **federal reservoirs. So the inflow is a**
 19 **combination of the two. When you do have more**
 20 **water coming in from the Flint side, the Corps**
 21 **can effectively reduce the release --**
 22 THE WITNESS: I'm sorry, your Honor.
 23 Can you hear me?
 24 **A. The Corps would reduce release from the**
 25 **Chattahoochee side so that the combined water**

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1 **going into Jim Woodruff is just 5,000 cfs. Now,**
 2 **that is in effect putting that extra water into**
 3 **storage by releasing less.**
 4 **Q.** Dr. Zeng, have you seen what you just described,
 5 this offsetting, in practice?
 6 **A. Yes.**
 7 **Q.** Okay. Can I ask you to go to the next tab in the
 8 binder, which is tab 11. And this is a chart, I
 9 believe, that was shown to Dr. Shanahan. And I
 10 want to ask if you can explain how this chart
 11 relates to this offset concept you just
 12 described.
 13 **A. Yes. So let me first explain what the curves**
 14 **are. Again, this is a -- this is a 2012 flow**
 15 **chart, a 2012 hydrograph. And that starts from**
 16 **April 1st all the way to December 31st. And the**
 17 **blue curve here is the flow that goes into**
 18 **Apalachicola River. And the orange curve here is**
 19 **the one that comes down the Flint River. And as**
 20 **we see, in the first oval, the flow in the Flint**
 21 **had a variation of roughly 2,000 cfs -- roughly**
 22 **2,000 cfs up and down, up and down. And, yet,**
 23 **you cannot see any kind of corresponding change**
 24 **in terms of releases the Corps made into the**
 25 **Apalachicola River.**

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1 think it's tab 7; but it's the map.
 2 Yes.
 3 Where is Battle Bend?
 4 MR. PRIMIS: Battle Bend?
 5 SPECIAL MASTER LANCASTER: Battle Bend.
 6 THE WITNESS: Battle Bend? I don't know
 7 that.
 8 SPECIAL MASTER LANCASTER: You don't
 9 know?
 10 THE WITNESS: No.
 11 SPECIAL MASTER LANCASTER: Okay.
 12 MR. PRIMIS: Any other questions?
 13 SPECIAL MASTER LANCASTER: No.
 14 BY MR. PRIMIS:
 15 **Q.** Okay. You can have a seat.
 16 Now, Dr. Zeng, you were here during
 17 Dr. Shanahan's testimony; is that correct?
 18 **A. Yes.**
 19 **Q.** Did you detect there was a change from his
 20 written testimony to the live testimony he gave
 21 here in court?
 22 **A. I did.**
 23 **Q.** And what did you -- what did you perceive?
 24 **A. Well, I believe in his -- in his written direct**
 25 **he said the amount of flow or the -- the amount**

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1 **Similarly, we can see the same thing around**
 2 **the October, November time frame, where the flow**
 3 **in the Flint River fluctuated over 1000 cfs,**
 4 **maybe 1500, maybe close to 2,000 cfs; and, yet,**
 5 **you don't see -- with an exception of this blip**
 6 **here, you don't see the Corps follow suit. You**
 7 **don't see the Corps making a release that**
 8 **reflects the change in the flow in the Flint**
 9 **River. So --**
 10 **Q.** Dr. Zeng, as a hydrologist, what does that
 11 phenomenon tell you?
 12 **A. That tells me that the Corps has made a change in**
 13 **its release in -- from the Chattahoochee side,**
 14 **from the federal reservoirs in the Chattahoochee**
 15 **side so that the flow provided to the Jim**
 16 **Woodruff project is just 5,000 cfs. That tells**
 17 **me that when this flow goes up, they made less**
 18 **release in the upstream reservoir to support Jim**
 19 **Woodruff.**
 20 **Q.** Okay. Thank you, Dr. Zeng. I think you can take
 21 your seat now.
 22 SPECIAL MASTER LANCASTER: Excuse me.
 23 MR. PRIMIS: Sorry.
 24 SPECIAL MASTER LANCASTER: Before you
 25 return, Mr. Smith, would you put back -- I

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1 **of flow coming from the Flint side or the added**
 2 **flow coming from the Flint side would be**
 3 **released; it would be passed through the Jim**
 4 **Woodruff project into Florida. And then when he**
 5 **was shown that figure with the fluctuation in the**
 6 **flow in the Flint River and with the lack of**
 7 **change in the release the Corps made into the**
 8 **Apalachicola River, I believe he changed his**
 9 **story to, well, that amount is spread out. It**
 10 **ultimately came down to Florida.**
 11 **Q.** Did you hear him say something about there was a
 12 question of when, but not if?
 13 **A. Right.**
 14 **Q.** And how does that relate to your testimony?
 15 **A. Well, if he -- if he -- what he said was if that**
 16 **water ultimately comes down, it's not coming down**
 17 **at the right time. That seems to be the argument**
 18 **that -- that we have been making.**
 19 **Q.** And why is timing important when it comes to
 20 reservoir operations?
 21 **A. Well, because I think we are talking about timing**
 22 **of flow, timing of increased flow that goes**
 23 **across the state line at the right time.**
 24 **Q.** And what is the right time and how does it get
 25 there?

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1 **A. My understanding is that the argument that**
 2 **Florida made was the right time is the**
 3 **summertime, and it's when the water use is cut or**
 4 **the conservation of water is made. And that**
 5 **would be the time for flow to come back past the**
 6 **state line into Florida.**
 7 **Q.** Is that how the system works?
 8 **A. That clearly wasn't something that we saw from**
 9 **the Corps' real operation.**
 10 **Q.** Okay. Does the Corps favor any single project
 11 purpose over another?
 12 **A. No.**
 13 **Q.** There was a suggestion that the Corps would use
 14 its discretion to favor fish and wildlife and
 15 that purpose. Did you hear that testimony?
 16 **A. I heard that.**
 17 **Q.** And what is your understanding of how the Corps
 18 works in that regard?
 19 **A. Well, I believe the Corps operates according to**
 20 **its operational plan, which has been blessed,**
 21 **which has been approved by Fish and Wildlife**
 22 **Service. So -- so the Corps sticks to its plan;**
 23 **and the plan meets the needs of endangered**
 24 **species.**
 25 **Q.** Dr. Zeng, to get a predictable or reliable

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1 **A. No.**
 2 **Q.** Did you ever hear Florida propose a remedy during
 3 those negotiations that did not include the Corps
 4 in some fashion?
 5 **A. No.**
 6 **Q.** Okay. Now, I want to go back to the ACF
 7 Stakeholder plan, which is tab 15, in the book.
 8 It's GX-1325. And are you familiar with the
 9 recommendations set out in that plan?
 10 **A. Yes.**
 11 **Q.** And what do you perceive to be the most important
 12 recommendation that the ACFS Stakeholders made?
 13 **A. The most important recommendations they made are**
 14 **changes to the Corps operation throughout the**
 15 **basin, different aspects; but all of them are**
 16 **changing the Corps operation.**
 17 **Q.** Can I ask you to turn to page 4 of tab 15, page 4
 18 of GX-1325.
 19 **A. I'm sorry -- oh, yes.**
 20 **Q.** And in particular on page 4, I want to focus on
 21 the first paragraph; and there are four bullet
 22 points underneath it. And can you just take a
 23 minute to read that to yourself, and then I'll
 24 ask you the question.
 25 **A. Yes.**

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1 increase in flow into Florida during a drought,
 2 what would have to happen?
 3 **A. What would need to happen is the Corps would need**
 4 **to change its operation and to change those**
 5 **numbers that we saw earlier in the operational**
 6 **chart.**
 7 **Q.** Based on your experience and familiarity with
 8 Corps operations and how this basin works, is it
 9 necessary to have the Corps involved in order to
 10 provide Florida a predictable and dependable flow
 11 in excess of 5,000 cfs during droughts?
 12 **A. Yes.**
 13 **Q.** I want to briefly touch back on your role in the
 14 tri-state negotiations. And, again, we're not
 15 talking about any mediation for the present
 16 proceeding. Okay?
 17 And I think you said you were personally
 18 involved in negotiations with Florida?
 19 **A. That's correct.**
 20 **Q.** And can you describe your involvement?
 21 **A. My role was to provide technical analysis and**
 22 **technical advice to the chief negotiator.**
 23 **Q.** And in connection with that work, did you ever
 24 hear of a workable proposal that did not include
 25 a change to Army Corps operations?

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1 **Q.** Can you tell the Court what is the ACFS
 2 recommending with regard to U.S. Army Corps
 3 operations here on page 4?
 4 **A. The ACF Stakeholder recommended four actions on**
 5 **the Corps side, and the first one being changing**
 6 **one of the -- the reservoir topic of**
 7 **conservation. That's a slight change that ACFS**
 8 **suggested. What it does is expands storage in**
 9 **the reservoir system to make more storage**
 10 **available for meeting different purposes.**
 11 **And the second one they recommended is a**
 12 **change of the action zones in terms of tandem**
 13 **operation. We said this earlier, that the tandem**
 14 **operation really means how the upstream**
 15 **reservoirs support the downstream reservoirs. So**
 16 **they recommended the change there.**
 17 **And the third one is they recommended**
 18 **changing the peaking power generation**
 19 **requirement. The peaking power requirement**
 20 **drives water out of the reservoirs. So the**
 21 **stakeholder wanted that part of the operation to**
 22 **be revised.**
 23 **And then the fourth element here is to**
 24 **provide two pulse flows into the Apalachicola**
 25 **River. One is in May for two weeks, and the**

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1 **other one is in the month of July for two weeks.**

2 **Q.** Dr. Zeng, when you take these four

3 recommendations on Army Corps operations as a

4 package, just in laymen's terms, what is the

5 group trying to accomplish with these

6 recommendations?

7 **A.** **The group is trying to accomplish a balanced -- a**

8 **balanced approach, taking care of the interests**

9 **of all of the stakeholders.**

10 **Q.** And as it relates to storage and achieving

11 purposes, what are they saying here in these four

12 bullets?

13 **A.** **They're saying the Corps -- the Corps' change of**

14 **action is needed to achieve this balanced -- this**

15 **balanced approach.**

16 **Q.** Okay. Dr. Zeng, I want to turn now to the third

17 topic in your testimony; and that's something you

18 called natural hydrologic change. Correct?

19 **A.** **Yes.**

20 **Q.** Does Georgia study the natural hydrology of the

21 ACF Basin?

22 **A.** **Yes.**

23 **Q.** And what do you mean when you say natural

24 hydrology?

25 **A.** **Well, we started by looking at the precipitation**

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1 talking about both how much rain falls, but also

2 when it falls?

3 **A.** **That's correct.**

4 **Q.** Okay. Can you turn to the next -- or to tab 12

5 in your book. And this is -- I believe this

6 chart appears in your written direct and comes

7 from GX-1042.

8 Can you -- I think the Court has seen this

9 before from other witnesses; but you created it.

10 Can you explain what this shows?

11 **A.** **Yes. First of all, let me explain what the**

12 **curves are. And so each curve represents the**

13 **monthly precipitation. And the -- the red curve**

14 **represents the period between 1975 and 2013.**

15 **This is what I call the modern decade -- decades.**

16 **And then there is the earlier decades, which**

17 **started from 1995 and all the way through 1974.**

18 **So I compared the rainfall patterns in those two**

19 **periods to see if there are changes.**

20 **Q.** And what did you find?

21 **A.** **Well, we found, indeed, there has been a change**

22 **in the rainfall pattern, especially when you look**

23 **at the middle part of the year, which turned out**

24 **to be the drier part and the part that -- that's**

25 **related to lower flow, usually in the year in**

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1 **in the basin. And the precipitation in the basin**

2 **has certainly not been impacted by the human**

3 **activities in the State of Georgia.**

4 **Q.** So why have you studied that?

5 **A.** **Well, when we -- years ago we had -- we had come**

6 **across arguments about the change or the lack of**

7 **change in precipitation, but then the change in**

8 **streamflow. So there were a lot of discussions**

9 **about the change in streamflow. And naturally,**

10 **there is the question of why? All right. So why**

11 **was there these streamflow changes? Why have we**

12 **been observing these things?**

13 **And so we started looking into it, and the**

14 **right place to start certainly is rainfall.**

15 **Q.** Did you do a study of changes in precipitation

16 over the last several decades?

17 **A.** **Yes, we did.**

18 **Q.** What did you look at?

19 **A.** **We looked at the -- the rainfall that happens in**

20 **the basin; and also we looked at how the rainfall**

21 **happens, you know, within the year, how rainfall**

22 **happens in each month. So we look at that**

23 **pattern, what we call the intra-annual rainfall**

24 **pattern.**

25 **Q.** Are you talking -- just to be clear, are you

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1 **this basin.**

2 **Q.** Well, by reference to the chart, can you just

3 tell us what it means when you see the blue line

4 significantly above the red line in June, July,

5 and August? What does that mean?

6 **A.** **Yes. If we just look at the one on the right,**

7 **this is the one for CD4, and in particular if we**

8 **look at the month of July, we're seeing that for**

9 **the modern decades, for the past four decades,**

10 **we're seeing a -- a once every 20 year type of**

11 **drought. Once every 20 year type of drought, and**

12 **you would see a rainfall of 2 inches in the month**

13 **of July.**

14 **But if you look at the same level of drought**

15 **severity, you look at the prior decades, you**

16 **would see a more than 3 inches of rainfall. So**

17 **that comparison tells me that the prior decades**

18 **had more than 50 percent more rainfall in that**

19 **month.**

20 **Q.** What is the practical impact in terms of

21 streamflow of having that kind of reduction in

22 precipitation over time?

23 **A.** **It would certainly mean lower flow in the**

24 **streams.**

25 **Q.** Do you -- are these the only two charts you

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1 created like this; or did you look at it across
 2 other criteria?
 3 **A. Well, like I said, I -- this is one for the once
 4 every 20 years type of drought. And there are
 5 others. For example, I also looked at once every
 6 10 years, once every four years, and once every
 7 two years. In the subsequent study, I actually
 8 did much more than that. I looked at the
 9 intervals right in between. And all of them are
 10 showing the same pattern. All of them are
 11 showing that the rainfall that used to take place
 12 in the middle of the year has been squeezed to
 13 toward the sides of the year, which means we're
 14 having a drier summer in comparison to the past;
 15 and we're having a wetter winter in comparison to
 16 the past.**
 17 **Q.** And, Dr. Zeng, we included it in your book; but
 18 can you just say -- check tab 16 and tell us if
 19 GX-1042 is the study that you conducted?
 20 **A. That's correct.**
 21 **Q.** Now, are you aware of any other expert who looked
 22 into precipitation in this case?
 23 **A. It looks like Dr. Lettenmaier looked into this.**
 24 **Q.** And what did -- did you look at his study?
 25 **A. Yes.**

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1 them. What's your view?
 2 **A. Well, I heard him say that. But I think I also
 3 heard him say just before that that he said he
 4 didn't quite understand what was done here.**
 5 **Q.** Okay. Dr. Zeng, did you look at changing
 6 patterns in rainfall in any other kind of
 7 context?
 8 **A. Well, we looked at the impact on streamflow.**
 9 **Q.** Okay. And did you look at the impact on other
 10 streams other than the Chattahoochee, Flint, and
 11 Apalachicola?
 12 **A. We did.**
 13 **Q.** Okay. Why did you look at other rivers in the
 14 region?
 15 **A. Well, it makes sense when we look at one river
 16 basin. And in particular there are complicated
 17 factors playing in this basin. It makes sense
 18 for us to look beyond that basin and see a basin
 19 that don't have similar conditions and see
 20 whether or not you have a control river basin
 21 that gives you the benchmark, that gives you the
 22 background to -- or to give you a reference
 23 point.**
 24 **Q.** Can you turn to tab 13.
 25 And, Dr. Zeng, what does the demonstrative at

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1 **Q.** And what did you find in his study with regard to
 2 this intra-annual pattern of drier summers and
 3 wetter winters?
 4 **A. I believe he saw similar trends as we saw here.
 5 But he -- he categorized the differences that he
 6 saw as statistically not significant.**
 7 **Q.** And what is your view?
 8 **A. Well, I think his statistically significant or
 9 not significant difference in his own words means
 10 are these differences by chance? And he only
 11 looked at the mean -- I think the median -- the
 12 median value; and then he made his determination
 13 he thinks that they are not statistically
 14 significant or, in other words, that he thinks
 15 that they weren't extensive.**
 16 **But I have looked at the ones 20 years to the
 17 ones two year -- once every two years. And I
 18 looked at all the probabilities in the middle.
 19 And all of them -- all of them are showing the
 20 same trend. All of them are showing the same
 21 pattern. I think we're beyond doubt that these
 22 differences are not because of chance.**
 23 **Q.** Dr. Zeng, I think Dr. Lettenmaier had these two
 24 charts on the screen. And if I can quote him, he
 25 said, they are completely flawed. You created

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1 tab 13 show?
 2 **A. This is showing other rivers in Florida, other
 3 rivers in the Panhandle part of Florida. And we
 4 looked at the gage rivers of these streams. And
 5 we compared them with the -- with the flow that
 6 took place in the Chattahoochee River -- in the
 7 Apalachicola River.**
 8 **Q.** And what did you find?
 9 **A. We found all of these streams -- if you look at
 10 the past four decades, all of them are showing
 11 the same type of declining trend.**
 12 **Q.** As a hydrologist, what does it tell you that
 13 other rivers that aren't impacted by Georgia's
 14 ACF water use are showing a similar declining
 15 trend?
 16 **A. Well, it tells me that there is a regional trend
 17 that is taking place -- that has taken place in
 18 the past decades. And that regional pattern --
 19 that regional pattern certainly was not the
 20 result of Georgia's consumptive water use.**
 21 **Q.** Now, you testified a bit on cross-examination
 22 about another study you did which looked at just
 23 the decline in flows in the Apalachicola. Is
 24 that right?
 25 **A. That's right.**

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1 **Q.** Can -- and this is just south of the state line.
 2 Right?
 3 **A. That's correct.**
 4 **Q.** Okay. Can you explain what analysis you did on
 5 that?
 6 **A. Okay. Now, that one, we know that the total**
 7 **amount of water going into the Apalachicola Bay**
 8 **is not the same amount that crosses the state**
 9 **line. So there's water added. There is flow**
 10 **added in the Florida part of the basin. And that**
 11 **was water converted from rainfall, from flows in**
 12 **the tributaries. And so this added part is what**
 13 **I call flow generated within the Florida portion**
 14 **of the state.**
 15 **Q.** Does Georgia's consumptive use have any
 16 relationship or impact on this flow that's
 17 created just within Florida?
 18 **A. No.**
 19 **Q.** Okay. And can you turn to tab 14, demonstrative
 20 14? And did you prepare this demonstrative?
 21 **A. Yes.**
 22 **Q.** Can you explain to the Court what this one means?
 23 **A. Yes. This is a table that shows the state line**
 24 **flow. And so we're -- I'm going to the title**
 25 **column here. So it shows the flow in the**

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1 **A. No.**
 2 **Q.** And, Dr. Zeng, Mr. Qureshi asked you some
 3 questions about the Sumatra Gage and whether that
 4 was appropriate to look at. Did you look at any
 5 other gages in Florida to double-check?
 6 **A. In terms of declining flow?**
 7 **Q.** Yes.
 8 **A. Yes.**
 9 **Q.** And what did you do in that regard?
 10 **A. Well, we looked at the -- we looked at the**
 11 **Blountstown Gage, which is right downstream of --**
 12 **it's downstream of Chattahoochee, but upstream of**
 13 **Sumatra Gage. We also looked at the gage that is**
 14 **immediately downstream of Blountstown but is**
 15 **upstream of Sumatra Gage. So there are two other**
 16 **gages in the Florida part of the Apalachicola**
 17 **River. And we looked at those two gages as well,**
 18 **and we found similar declining trends at those**
 19 **two gages as well.**
 20 **Q.** Now, Dr. Zeng, as a hydrologist who studies this
 21 basin, what does it tell you that Florida is
 22 contributing as much as 4,000 cfs less into the
 23 flow into Apalachicola Bay than it was decades
 24 ago?
 25 **A. Well, it tells me that there clearly is an issue**

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1 **Chattahoochee River -- or this is the state line**
 2 **flow, the first row.**
 3 **Q.** Let's start over. Is the first flow the
 4 Chattahoochee Gage?
 5 **A. Yes.**
 6 **Q.** And where is that?
 7 **A. That is right downstream of Jim Woodruff project.**
 8 **Q.** And then what did you observe next at Sumatra
 9 Gage?
 10 **A. I looked at the flow at Sumatra Gage.**
 11 **Q.** And this -- why is the flow in Sumatra higher
 12 than Chattahoochee?
 13 **A. Well, that's because there's flow coming into the**
 14 **basin in the Florida part of the basin.**
 15 **Q.** Then you have a row that says Florida's
 16 Contribution. And what is that?
 17 **A. That is simply the difference between the first**
 18 **two.**
 19 **Q.** And what trend do you see in Florida's
 20 contribution to flows into Apalachicola Bay?
 21 **A. Well, from the late '70's to the year 2013, 2014,**
 22 **we're seeing a declining flow that -- that came**
 23 **into existence solely in the Florida part of the**
 24 **basin.**
 25 **Q.** Did Georgia play any role in that?

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1 **with the flow coming into the river in the**
 2 **Florida part. It also concerns me that in**
 3 **addressing -- in trying to address the issue,**
 4 **Florida does not look into this issue, does not**
 5 **acknowledge that even that -- that it's even an**
 6 **issue while looking toward the north of the state**
 7 **line and seeking higher flow coming from north of**
 8 **the state line as a solution to their problems.**
 9 **Q.** Thank you, Dr. Zeng.
 10 MR. PRIMIS: I have no further
 11 questions.
 12 SPECIAL MASTER LANCASTER: Recross?
 13 RECCROSS-EXAMINATION
 14 BY MR. QURESHI:
 15 **Q.** Good afternoon Dr. Zeng.
 16 **A. Good afternoon.**
 17 **Q.** I want to finish up where you just finished with
 18 Georgia's counsel on redirect.
 19 You mentioned you looked at two other gages
 20 in Florida. One was Blountstown, and what was
 21 the other one?
 22 **A. It's called Wewahitchka.**
 23 **Q.** Wewahitchka?
 24 **A. Wewahitchka, thank you.**
 25 **Q.** Okay. And where was that analysis presented in

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1 your direct testimony?

2 **A. It was not.**

3 **Q.** Okay. And the Sumatra Gage, did you have a

4 chance to check that at lunch? Were you able to

5 confirm that the data from 1978 to 2013, the

6 daily data, is no longer up?

7 **A. I didn't have a chance to check that.**

8 **Q.** Okay. I noticed on paragraph 155 on page 55 of

9 your direct testimony that you have information

10 going from 1972 through 2012 on that figure

11 there.

12 **A. Yes.**

13 **Q.** Are you aware that there is no Sumatra data for

14 1972?

15 **A. I'm aware of that.**

16 **Q.** Okay. I want to --

17 **A. But we did use some data. We did use the Corps**

18 **data.**

19 **Q.** Okay.

20 **A. The Corps had field data.**

21 **Q.** I want to talk about -- I'm sorry. Are you

22 finished?

23 **A. Go ahead.**

24 **Q.** I want to talk about the Corps data and some of

25 the observations you made about the Corps RIOP.

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1 **Q.** And so you're thinking of the greater than or

2 equal to sign as a target?

3 **A. In effect, yes.**

4 **Q.** Okay. And from a mathematical perspective, you

5 understand that greater than or equal to allows

6 for variation?

7 **A. I understand the greater than or equal to means**

8 **at least 5,000.**

9 **Q.** Okay. You also explained in your prefiled direct

10 that there are various places in the DEIS where

11 the Corps describes the 5,000 as a target. Is

12 that right?

13 **A. Yes.**

14 **Q.** And you are aware, sir, that there are many

15 places in the DEIS where the Corps explicitly

16 states the 5,000 is not a target. Are you aware

17 of that?

18 **A. I'm not aware of that.**

19 **Q.** Okay. Well, perhaps I can walk through some of

20 those. We're going to have to switch binders.

21 If you could look at tab 30 of the binder that I

22 gave you this morning, and we can walk through

23 some of those examples. I suggest we start with

24 going to pages -- and we only included excerpts.

25 But we can start with the pages marked 2-72

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1 If we could turn for a moment to -- I believe

2 it's tab 9 of the binder that Georgia's counsel

3 provided you. Do you have that in front of you,

4 sir?

5 **A. Tab 9?**

6 **Q.** Tab 9 of the binder that Georgia's counsel

7 provided you.

8 **A. Yes.**

9 **Q.** You actually walked us through this table while

10 you were standing. And you kept pointing to the

11 number 5,000. Is that correct?

12 **A. Yes.**

13 **Q.** Okay. There's actually a figure in front of the

14 5,000, but you never mentioned it. Can you tell

15 us what that figure represents?

16 **A. That represents greater than or equal to.**

17 **Q.** Okay. And what does that mean?

18 **A. It means -- it means 5,000 or higher.**

19 **Q.** Okay. You testified, sir, in your prefiled

20 direct testimony that the Corps treats the 5,000

21 cfs minimum flow requirement as a target.

22 **A. Yes.**

23 **Q.** Okay. And by that you're suggesting that the

24 Corps releases as close to 5,000 as possible?

25 **A. Yes.**

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1 through 2-73.

2 **A. Where is that?**

3 **Q.** It's at page 2-72 through 2-73. And there's a

4 discussion beginning at the bottom of the page

5 that says, quote, the flow rates included in

6 table 2.1.5, the table we were just looking at.

7 Can you read that?

8 **A. I see that. Yes.**

9 **Q.** Do you see the reference to prescribed minimum,

10 not target releases?

11 **A. I see that.**

12 **Q.** Okay. Were you aware of this section when you

13 wrote your direct testimony?

14 **A. Well, apparently I didn't read that.**

15 **Q.** Okay.

16 **A. Or didn't read that carefully.**

17 **Q.** Sir, can you please turn to page 1-10.

18 **A. 1-10.**

19 **Q.** And the pages are not sequential, so you will

20 find it a couple places after.

21 **A. Page 1-10?**

22 **Q.** Yes, sir.

23 **A. I'm here.**

24 **Q.** Okay. And, again, you will notice the paragraph

25 that states the flow rates included in table

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1 1.2-3 prescribe minimum and not target releases.
 2 Do you see that?
 3 **A. Where is that, please?**
 4 **Q.** It's the sentence that begins, the flow rates
 5 included in --
 6 **A. The last paragraph?**
 7 **Q.** Yes, sir.
 8 **A. Okay. I see that.**
 9 **Q.** Okay. And were you aware of this when you
 10 prepared your direct testimony?
 11 **A. I'm aware of this document.**
 12 **Q.** Were you aware of the sentence we just read, sir?
 13 **A. I'm not aware of the sentence.**
 14 **Q.** Okay. Similarly, let's go to table -- I'm sorry,
 15 page 1-16. And that's a similarly worded
 16 sentence which begins with, the flow rates
 17 included.
 18 **A. I see that.**
 19 **Q.** Okay. And I have the same question for you; were
 20 you aware of that sentence when you prepared your
 21 direct testimony?
 22 **A. Well, I'm aware of the Corps' general saying of**
 23 **that; but I'm not aware of this specific**
 24 **sentence.**
 25 **Q.** Okay. Thank you, sir.

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1 I'm going to return to some of the other
 2 topics that were covered during your redirect
 3 examination, sir. May we return to tab 3 that's
 4 the UIF report? This is tab 3 of the big binder,
 5 sir.
 6 **A. I'm here.**
 7 **Q.** Okay. And before we go into the body of the
 8 document, you're aware that GWRI is part of a
 9 National Institute for Water Resources in
 10 affiliation with USGS?
 11 **A. I'm not aware of that.**
 12 **Q.** You never heard that before?
 13 **A. Well, they might have some affiliation; but I'm**
 14 **not aware of that.**
 15 **Q.** Okay. And in discussing the UIF datasets, sir,
 16 you agree that the UIF's prepared by the Corps
 17 rely on consumptive use information or demand
 18 information from Georgia EPD?
 19 **A. I'm aware of that, yes.**
 20 **Q.** Okay. And that's actually information that you
 21 provide. Right?
 22 **A. Yes.**
 23 **Q.** And this report is critical of that information;
 24 is it not?
 25 **A. Well, it's critical of some agricultural**

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1 **estimates. I'm aware of that.**
 2 **Q.** Okay. And the particular agricultural estimates
 3 that it's critical of are the evaporations from
 4 farm ponds. Correct?
 5 **A. I'm aware of that.**
 6 **Q.** And I believe during your redirect, Georgia's
 7 counsel discussed that there were certain
 8 potential farm ponds in the Georgia portion of
 9 the ACF Basin. You know they exist. Right?
 10 **A. Well, the farm ponds exist, yes.**
 11 **Q.** And you know that there's more than 20,000 of
 12 them. Right?
 13 **A. I'm -- well, again, the number of water bodies he**
 14 **identified would be that number. But I'm not**
 15 **sure all of them are farm ponds.**
 16 **Q.** You have done an analysis of farm pond
 17 evaporation; haven't you?
 18 **A. I have.**
 19 **Q.** Okay. And that was not produced in this
 20 litigation because it's privileged. Is that
 21 right?
 22 **A. That's right.**
 23 **Q.** Okay. And the UIF indicates that the net loss
 24 from evaporation of farm ponds could be as high
 25 as 1200 cfs. Is that right?

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1 **A. That's what the document says.**
 2 **Q.** That's what the document says; correct.
 3 There are other criticisms of the UIF
 4 dataset; are there not?
 5 **A. There are, yes.**
 6 **Q.** And one of them we looked at earlier today is
 7 behind tab 9, sir?
 8 **A. I'm here.**
 9 **Q.** Okay. And in particular, under the section
 10 Inappropriate Use of the Unimpaired Flow Dataset,
 11 there is a sentence that begins, for example, and
 12 then a following sentence that begins with,
 13 however. Can you read both of those, please.
 14 **A. Can you direct me to the right location?**
 15 **Q.** Certainly. It's the second paragraph and sort of
 16 the middle of the page. It's the sentence that
 17 begins, for example, the unimpaired flows do not
 18 represent.
 19 **A. Okay. I found it.**
 20 MR. QURESHI: If you can actually
 21 highlight the following sentence as well.
 22 **A. I see that.**
 23 **Q.** Okay. And you were aware of this when you
 24 prepared your prefiled direct testimony, sir?
 25 **A. I was aware of this, yes.**

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- 1 **Q.** And you were aware of it at the time you
- 2 submitted your testimony?
- 3 **A. Yes.**
- 4 **Q.** In your prefiled direct testimony at paragraph
- 5 22, you include a figure 3.
- 6 **MR. QURESHI:** If you can put that up on
- 7 the screen.
- 8 **BY MR. QURESHI:**
- 9 **Q.** And you can certainly review it in front of you
- 10 as well.
- 11 **A. Did you say 22?**
- 12 **Q.** Paragraph 22, page 7.
- 13 **A. Yes.**
- 14 **Q.** And the peak consumptive use here looks to be at
- 15 some time in the summer of 2012. Does that seem
- 16 right to you?
- 17 **A. That seems right.**
- 18 **Q.** Okay. And it's roughly at 1,800 cfs?
- 19 **A. That seems right, yes.**
- 20 **Q.** Okay. And do you know what the monthly flows in
- 21 the Apalachicola River were at this point in
- 22 time?
- 23 **A. 5,000 cfs.**
- 24 **Q.** Somewhere between five and 6,000?
- 25 **A. It's mostly 5,000 cfs.**

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- 1 **A. Yes.**
- 2 **Q.** Okay. And you're aware that the caption of this
- 3 slide refers to Georgia's Upstream Consumptive
- 4 Use of Water?
- 5 **A. Yes.**
- 6 **Q.** Are you familiar with how Florida's expert,
- 7 Dr. Hornberger, defines consumptive use?
- 8 **A. I think I understand what that concept is.**
- 9 **Q.** Okay. And it's equivalent -- it's actually
- 10 different than the way you described consumptive
- 11 use; is it not?
- 12 **A. I'm not sure that would be different, but go**
- 13 **ahead.**
- 14 **Q.** Well, I guess my question for you is do you know
- 15 how he defines it?
- 16 **A. Well, if he's using every drop of water that was**
- 17 **pumped out of sources connected and not connected**
- 18 **to the streams, and water pumped out that does**
- 19 **not translate in a one-to-one relationship into a**
- 20 **streamflow, then I think I understand his -- his**
- 21 **concept.**
- 22 **Q.** Before you characterized this particular exhibit,
- 23 did you know how he defined consumptive use?
- 24 **A. I think I know how he defined it.**
- 25 **Q.** Did you read his prefiled direct testimony?

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- 1 **Q.** Okay. And do you know that 1,800 is
- 2 approximately 35 percent of 5,000 cfs?
- 3 **A. Yes. I understand the flow into Florida is about**
- 4 **two to three times that amount.**
- 5 **Q.** Okay. Sir, you also talked about the BiOp, the
- 6 2016 BiOp?
- 7 **A. Yes.**
- 8 **Q.** And you're familiar with that document?
- 9 **A. Well, reasonably. It just came out not too long**
- 10 **ago.**
- 11 **Q.** In October, I think?
- 12 **A. Yeah, something like that.**
- 13 **Q.** Okay. And you're aware that there's language in
- 14 the 2016 BiOp that says the most harmful thing
- 15 for a river -- for river biota is low flows?
- 16 **A. I couldn't -- I could believe they say that.**
- 17 **Q.** And you don't have any quarrel with that
- 18 statement; do you?
- 19 **A. I don't.**
- 20 **Q.** We looked at during your redirect examination,
- 21 sir, a slide that was in Florida's opening
- 22 statement. And that's behind tab 4 of the thin
- 23 binder.
- 24 **A. Tab 4 of the thin binder?**
- 25 **Q.** Yes, the binder that Georgia -- yes.

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- 1 **A. Not in very detail.**
- 2 **Q.** Okay. We can put up page 9 of his prefiled
- 3 direct, and it will give you some idea of how
- 4 Dr. Hornberger defines consumptive use.
- 5 **MR. QURESHI:** It's actually page 9.
- 6 You can also blow up the definition of
- 7 streamflow depletions and withdrawals, please.
- 8 **A. I see it.**
- 9 **Q.** Okay. And do you see his definition of
- 10 streamflow depletion as well?
- 11 **A. Yes.**
- 12 **Q.** And his definition of consumptive use is
- 13 different than yours, sir?
- 14 **A. It appears to be, yes.**
- 15 **Q.** Okay. And were you aware of that difference when
- 16 you opined on the slide behind tab 4 of the thin
- 17 binder?
- 18 **A. Well, I understand there is a difference, yes.**
- 19 **Q.** Okay. Another slide you walked us through during
- 20 your redirect examination is behind tab 5. Do
- 21 you see that?
- 22 **A. I see that, yes.**
- 23 **Q.** Okay. And tab 5 is a PowerPoint slide made out
- 24 of Florida Exhibit 518; but it actually covers up
- 25 the footnotes for the exhibit. Did you -- did

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1 you have a chance to review the actual exhibit;

2 or did you only look at the PowerPoint slide?

3 **A. I had a chance --**

4 **Q.** To look at the actual footnotes?

5 **A. Yes.**

6 **Q.** And are you, therefore, aware that the footnotes

7 explained that the numbers calculated for

8 population and irrigation acres don't come from

9 Florida; but they come from Georgia's experts.

10 Did you know that?

11 **A. I understand that.**

12 **Q.** All right. And you -- you were aware of that?

13 **A. I understand that, yes.**

14 **Q.** Okay. Sir, when you describe the Corps

15 operations in your prefiled direct testimony, you

16 highlight something called provisional data or

17 daily project data; is that right?

18 **A. That's correct.**

19 **Q.** And in fact if we look at the thin binder

20 behind -- behind tab 10, there is a reference to

21 GX-143. Correct?

22 **A. Yes.**

23 **Q.** All right. And GX-143 is a database of

24 information that EPD stores on its computers but

25 that are not stored on government computers, USGS

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1 omissions, any missing information?

2 **A. Copying data from the Corps website to our**

3 **database, probably not.**

4 MR. QURESHI: Okay. Your Honor, with

5 your permission, I would like to hand out a

6 demonstrative.

7 SPECIAL MASTER LANCASTER: Sure.

8 BY MR. QURESHI:

9 **Q.** Okay. Sir, I have handed you screen shots from

10 the database that we were just talking about,

11 GX-143. And if you look at the series of issues

12 we have identified, you will see that there's

13 missing periods of time from which there is no

14 data. That's May 1, 2013, through May 15, 2013.

15 Do you see that?

16 **A. I see that.**

17 **Q.** Okay. And then there's particular days that

18 don't have any data whatsoever. For example,

19 April 14, 2014.

20 **A. I'm sorry. I couldn't read the words here.**

21 **Q.** Okay. Can you read the words in the yellow box?

22 **A. I can read the words in the yellow box. I was**

23 **trying to --**

24 **Q.** What do they say?

25 **A. Well, they say missing data.**

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1 or Army Corps of operations, on a daily basis.

2 They're there for a short time, but then they're

3 taken down. Is that correct?

4 **A. Well, I'm sure the Corps has a copy of that. But**

5 **the Corps just doesn't keep all of the data on**

6 **its website. The Corps has its past 35 days data**

7 **displayed in a particular website. We look at**

8 **that. We download the data on a weekly basis.**

9 **And we put it -- we maintain this database so**

10 **that the Corps data or the Corps data as showing**

11 **what they're doing is recorded in our database.**

12 **That's correct.**

13 **Q.** So EPD records it and then puts it in its own

14 database?

15 **A. That's correct.**

16 **Q.** And you do the same thing for USGS provisional

17 data?

18 **A. We do not do the same thing with the USGS**

19 **provisional data.**

20 **Q.** Okay. So the GX-143 contains what EPD has

21 recorded from the Army Corps of Engineers?

22 **A. That's correct.**

23 **Q.** Okay. And are there any errors in that database?

24 **A. Errors as in the Corps errors?**

25 **Q.** Are there any mistakes in the database, any

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1 **Q.** Okay. And if you want to flip through a couple

2 of other pages, there's other examples of that,

3 sir.

4 Were you aware of these issues with the EPD

5 database, sir?

6 **A. Well, I'm not sure you're looking at the right**

7 **tab. So I cannot say.**

8 **Q.** I'm just looking at what was provided to us,

9 GX-143.

10 **A. Right. Well, what was provided to you I think**

11 **were multiple tabs, multiple sheets. So I'm not**

12 **sure -- just by looking at a screen capture of**

13 **one of the tabs, I'm not sure that this is the**

14 **right part to look.**

15 **Q.** Okay. So in certain tabs it would have all the

16 dates except one?

17 **A. Well, I cannot tell you just by looking at this.**

18 **Q.** Understood.

19 MR. QURESHI: I have nothing further,

20 your Honor.

21 MR. PRIMIS: No further questions.

22 SPECIAL MASTER LANCASTER: Doctor, you

23 said that you didn't know where Battle Bend

24 is.

25 THE WITNESS: Right.

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1 SPECIAL MASTER LANCASTER: Have you ever
 2 heard the term before?
 3 THE WITNESS: Battle Bend, no.
 4 SPECIAL MASTER LANCASTER: So you don't
 5 know whether it's -- where it is, you don't
 6 know what slough it may be related to, Swift
 7 River?
 8 THE WITNESS: I know Swift Slough.
 9 SPECIAL MASTER LANCASTER: Swift Slough.
 10 THE WITNESS: Yes.
 11 SPECIAL MASTER LANCASTER: Do you know
 12 whether Battle Bend has any relationship to
 13 it?
 14 THE WITNESS: I don't -- I suppose this
 15 is part of a side river in Florida.
 16 SPECIAL MASTER LANCASTER: So would I be
 17 correct in assuming that you couldn't even
 18 hazard a guess as to the effect if we -- if
 19 the Court should order that the parties
 20 reroute the Apalachicola through Battle Bend,
 21 you wouldn't know what that would have caused
 22 or affect; is that correct?
 23 THE WITNESS: I wouldn't know, right.
 24 SPECIAL MASTER LANCASTER: Would you
 25 tell me, again, how Georgia measures its

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1 consumptive use?
 2 I know you testified about this, but I
 3 want to be sure I understand it.
 4 THE WITNESS: Yes. I need to sort of
 5 separate them, the municipal and industrial
 6 part from the agricultural part.
 7 SPECIAL MASTER LANCASTER: Right.
 8 THE WITNESS: For all of the municipal
 9 and industrial facilities, these facilities
 10 report their withdrawing data or their
 11 discharging data to us on a monthly basis.
 12 So for the hundreds of facilities that we
 13 regulate, we know how much they take; we know
 14 how much they return. So in general, the
 15 difference between the two is the consumptive
 16 use in the municipal and industrial sector --
 17 sectors.
 18 For agricultural, it is a little
 19 different. For agricultural irrigation,
 20 mostly for irrigation purposes, we have these
 21 irrigation systems that put water for growing
 22 crops. Now, we have a large sample of them
 23 metered. So we know how much water is used
 24 by each one of them. Now, each one of them
 25 would have a corresponding area. So this is

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1 how big of a land that I'm applying the
 2 water. So when I have the volume divided by
 3 the area, I have a depth. So that is how
 4 much water in terms of depth they applied on
 5 that field.
 6 And so with all the systems that collect
 7 this data, we know the collective volume. We
 8 also know the collective area. So when we
 9 apply -- when we divide the collective volume
 10 with the collective area, we have a depth.
 11 Right? So we have a representative depth by
 12 these metered systems. And then we apply
 13 that depth to the entire universe of
 14 irrigated acres.
 15 Then we have a volume, the total volume
 16 on top of all the irrigated acres. So that's
 17 how we know the agricultural water use.
 18 SPECIAL MASTER LANCASTER: And what
 19 percentage is not accurately measured?
 20 THE WITNESS: Well, the part that's
 21 measured covers about 50, 60 percent of
 22 irrigated fields or the irrigated acreage.
 23 SPECIAL MASTER LANCASTER: So if I
 24 understand you, 50 to 40 percent is just
 25 estimated?

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1 THE WITNESS: Right. Those were
 2 estimated by the metered ones.
 3 SPECIAL MASTER LANCASTER: I think you
 4 testified that certain aquifers were not
 5 connected by Florida or considered. Which
 6 aquifers are you talking about?
 7 THE WITNESS: There's -- there are
 8 aquifers that are called Claiborne, Clayton,
 9 and Cretaceous. They are actually below --
 10 they're below the Upper Floridan Aquifer. So
 11 the connection is really the Upper Floridan
 12 Aquifer at the top with the river cutting
 13 through the aquifer. That's the connection
 14 between the aquifer and the rivers.
 15 Now, the lower aquifers, since they're
 16 below the Floridan -- the Upper Floridan
 17 Aquifer, they don't have this connection to
 18 the streams.
 19 SPECIAL MASTER LANCASTER: Going to the
 20 Corps operations, take a particular dam. How
 21 is it manned?
 22 Take Woodruff, for example.
 23 THE WITNESS: Woodruff is -- I think
 24 there's a crew of several. And -- but the
 25 operation -- for example, the operation for

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1 power generation through their turbine unit,
 2 is decided by the office in Mobile. And
 3 directions are sent to the dam crew for them
 4 to --
 5 SPECIAL MASTER LANCASTER: But there
 6 must be one person in charge of Woodruff
 7 on -- on the ground?
 8 THE WITNESS: Yes, yes. There are crew
 9 that are in charge of Woodruff Dam, yes.
 10 SPECIAL MASTER LANCASTER: And one for
 11 each dam?
 12 THE WITNESS: One crew for each dam,
 13 yes.
 14 SPECIAL MASTER LANCASTER: And one
 15 person in charge of that crew on the dam?
 16 THE WITNESS: That's correct.
 17 SPECIAL MASTER LANCASTER: How many dams
 18 in total are there on all the rivers that
 19 we're concerned about?
 20 THE WITNESS: For the ACF Basin, there
 21 are five dams.
 22 SPECIAL MASTER LANCASTER: Well --
 23 excuse me.
 24 THE WITNESS: Are we talking about the
 25 federal dams?

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1 SPECIAL MASTER LANCASTER: I'm talking
 2 about all dams.
 3 THE WITNESS: All the dams excluding the
 4 private -- the Georgia power dams?
 5 SPECIAL MASTER LANCASTER: Yes.
 6 THE WITNESS: Oh, that's a larger
 7 number.
 8 SPECIAL MASTER LANCASTER: How large?
 9 THE WITNESS: I think we have four or
 10 five more Georgia power reservoirs that are
 11 actually being operated by the company for
 12 power generation.
 13 SPECIAL MASTER LANCASTER: Well, let's
 14 see. Morgan Falls?
 15 THE WITNESS: Yes.
 16 SPECIAL MASTER LANCASTER: West Point?
 17 THE WITNESS: West Point is a federal
 18 dam.
 19 SPECIAL MASTER LANCASTER: Langdale,
 20 Crow Hop, Riverview?
 21 THE WITNESS: I don't know whether or
 22 not they have the same name, but the ones
 23 that I know are --
 24 SPECIAL MASTER LANCASTER: Bartlett's
 25 Ferry?

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1 THE WITNESS: Yes, Bartlett's Ferry.
 2 SPECIAL MASTER LANCASTER: Goat Rock?
 3 THE WITNESS: Oliver.
 4 SPECIAL MASTER LANCASTER: Oliver?
 5 THE WITNESS: Yes.
 6 SPECIAL MASTER LANCASTER: North
 7 Highlands?
 8 THE WITNESS: Yes.
 9 SPECIAL MASTER LANCASTER: City Mills?
 10 THE WITNESS: Some of these -- some of
 11 these -- yes. Some of these dams are what
 12 you would call a run-of-river mill type. So
 13 they have -- they cross the river; and that's
 14 it. So some of these, they don't really have
 15 operations.
 16 SPECIAL MASTER LANCASTER: But they're
 17 dams?
 18 THE WITNESS: They're dams, right.
 19 SPECIAL MASTER LANCASTER: Walter
 20 George?
 21 THE WITNESS: Walter F. George is a
 22 federal dam.
 23 SPECIAL MASTER LANCASTER: Buford?
 24 Whitewater?
 25 Crisp County?

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1 THE WITNESS: Crisp County is a private
 2 power project.
 3 SPECIAL MASTER LANCASTER: Lakewood?
 4 THE WITNESS: Lake Worth.
 5 SPECIAL MASTER LANCASTER: Lake Worth.
 6 THE WITNESS: That's along the Flint.
 7 SPECIAL MASTER LANCASTER: Those are all
 8 dams; aren't they?
 9 THE WITNESS: These are all dams, yes.
 10 SPECIAL MASTER LANCASTER: Federal or
 11 private or whatever; they're dams?
 12 THE WITNESS: Some are private, yes.
 13 SPECIAL MASTER LANCASTER: And every one
 14 of them has an effect on either the Flint or
 15 the Apalachicola?
 16 THE WITNESS: Well, most of these --
 17 most of these private dams are the so-called
 18 run-of-river projects or flow-through
 19 projects. So they don't have a whole lot of
 20 storage. So their mode of operation is
 21 usually they would release how much water
 22 that comes in. So in effect they have a
 23 limited ability to regulate the flow.
 24 SPECIAL MASTER LANCASTER: But they have
 25 some?

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1 THE WITNESS: They have some, yes. Some
 2 of them have some, yes.
 3 SPECIAL MASTER LANCASTER: And when you
 4 were considering your testimony and your
 5 opinions in this case, did you take into
 6 consideration any dam that had any effect?
 7 THE WITNESS: Certainly not the -- not
 8 the private dams, not the private
 9 run-of-river dams.
 10 SPECIAL MASTER LANCASTER: Finally, you
 11 were thoroughly interrogated by a very
 12 capable attorney at great length. Did that
 13 cause you to change any of your testimony,
 14 any of your conclusions?
 15 THE WITNESS: No.
 16 SPECIAL MASTER LANCASTER: Cross?
 17 Mr. Primis.
 18 MR. PRIMIS: No questions.
 19 MR. QURESHI: No questions.
 20 SPECIAL MASTER LANCASTER: You're
 21 finished.
 22 THE WITNESS: Thank you, your Honor.
 23 SPECIAL MASTER LANCASTER: Thank you.
 24 MS. WINE: Your Honor, did you want to
 25 take a break now while we're changing before
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1 the next witness, or do you want to keep
 2 proceeding?
 3 SPECIAL MASTER LANCASTER: You want to
 4 know whether I do?
 5 MS. WINE: Yes. You're the only one who
 6 matters.
 7 SPECIAL MASTER LANCASTER: I want to
 8 break all the time.
 9 How long before we're ready?
 10 MR. ALLEN: We're ready now, or we can
 11 take 15 minutes, your Honor. Either is fine.
 12 SPECIAL MASTER LANCASTER: Claudette?
 13 (Discussion off the record.)
 14 SPECIAL MASTER LANCASTER: Okay. Let's
 15 go.
 16 MR. ALLEN: All right.
 17 THE CLERK: Please raise your right
 18 hand.
 19 Do you solemnly swear that the testimony
 20 you shall give in the cause now in hearing
 21 shall be the truth, the whole truth, and
 22 nothing but the truth, so help you God?
 23 THE WITNESS: I do.
 24 THE CLERK: Please be seated.
 25 Pull yourself right up to the microphone
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1 and please state your name and spell your
 2 last name.
 3 THE WITNESS: Anna Kathryn Kirkpatrick,
 4 A N N A, K A T H R Y N, K I R K P A T R I C K.
 5 MR. ALLEN: Good afternoon, your Honor.
 6 Good to see you again.
 7 Georgia's next witness is Anna Kathryn
 8 Kirkpatrick, who is the vice chair of the
 9 Metropolitan North Georgia Water Planning
 10 District and also the chief policy officer
 11 for the Metro Atlanta Chamber of Commerce.
 12 She has over 20 years of experience in water
 13 supply and planning efforts.
 14 May I approach the witness to provide
 15 her with her testimony?
 16 SPECIAL MASTER LANCASTER: Please.
 17 DIRECT EXAMINATION
 18 BY MR. ALLEN:
 19 **Q.** Now, Ms. Kirkpatrick, do you recognize this as
 20 your prefiled written testimony in this case?
 21 **A. I do.**
 22 **Q.** And do you swear that it's true and accurate to
 23 the best of your knowledge?
 24 **A. I do.**
 25 MR. ALLEN: I tender the witness, your
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1 Honor.
 2 SPECIAL MASTER LANCASTER: Thank you.
 3 CROSS-EXAMINATION
 4 BY MR. FAWAL:
 5 **Q.** Good afternoon, Ms. Kirkpatrick. My name is
 6 Chris Fawal. I'm one of the attorneys for the
 7 State of Florida.
 8 MR. FAWAL: Your Honor, we've got a set of
 9 cross-examination binders. May I approach the
 10 witness?
 11 SPECIAL MASTER LANCASTER: Sure.
 12 BY MR. FAWAL:
 13 **Q.** Mr. Allen mentioned a bit of this, but you're the
 14 vice chair of the Metro North Georgia Water
 15 Planning District. Correct?
 16 **A. Correct.**
 17 **Q.** And it's okay if I refer to that as Metro
 18 District for short?
 19 **A. Yes.**
 20 **Q.** And Atlanta is in the Metro District. Correct?
 21 **A. The city of Atlanta, yes.**
 22 **Q.** You're also the chief policy officer of the Metro
 23 Atlanta Chamber of Commerce. Right?
 24 **A. I am.**
 25 **Q.** And the Atlanta Chamber of Commerce represents
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1 business interests; does it not?

2 **A. It does.**

3 **Q.** In lay terms, are you a lobbyist?

4 **A. Per ethics rules by the State of Georgia and**

5 **because of the nature of my job, I am required to**

6 **register as a lobbyist in the State of Georgia.**

7 **Q.** And your prefiled testimony focuses primarily on

8 municipal and industrial water use in the Metro

9 District. Is that right?

10 **A. Correct.**

11 **Q.** I'll -- so is it okay if I call that M & I for

12 short as well?

13 **A. It is.**

14 **Q.** Okay. The Court has heard a lot about

15 agricultural irrigation and the Flint River. And

16 we are switching gears a little bit to talk about

17 M & I in Atlanta. So I thought it might be

18 helpful -- I'm not sure if you were in the

19 courtroom when Dr. Zeng looked at a map. But if

20 you turn to tab 4 in your binder, do you

21 recognize that as a map of the ACF Basin?

22 **A. I do.**

23 **Q.** Okay. And you can see Atlanta is represented by

24 a dot and a gray area around it. Do you see

25 that?

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1 **Q.** And that's still in the Metro District. Correct?

2 **A. Yes.**

3 **Q.** And then the orange portion of this map

4 represents the Chattahoochee Basin. Right?

5 **A. Yes, according to the legend.**

6 **Q.** Okay. Ms. Kirkpatrick, I would like to talk a

7 little bit about Georgia's 2009 water contingency

8 planning task force. You're familiar with that.

9 Right?

10 **A. I am.**

11 **Q.** I'll probably call it the task force for short.

12 **A. Sounds good.**

13 **Q.** Trying to save us both some time.

14 You were the management lead for the task

15 force. Correct?

16 **A. Correct.**

17 **Q.** And the task force was set up as a response to a

18 ruling in a litigation from Judge Magnuson that

19 threatened Georgia and particularly Atlanta's

20 water supply. Correct?

21 **A. Correct.**

22 **Q.** And the task force examined supply options to

23 address those potential shortages. Right?

24 **A. They did, in the event that Lake Lanier was no**

25 **longer water supply for the region.**

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1 **A. I see the City of Atlanta with a dot, yes. And**

2 **the gray area is region around the City of**

3 **Atlanta.**

4 **Q.** Does that roughly correspond to the Metro

5 District?

6 **A. Roughly, without seeing county lines, I would say**

7 **yes.**

8 **Q.** Sure. Generally speaking, the Metro District

9 stretches south of the city of Atlanta down to, I

10 think it's Coweta County. Correct?

11 **A. Coweta.**

12 **Q.** Coweta?

13 **A. Yes.**

14 **Q.** I apologize. And metro Atlanta relies primarily

15 on Lake Lanier for its water supply. Right?

16 **A. That is correct.**

17 **Q.** Lake Lanier is just to the northeast of Atlanta?

18 **A. Correct.**

19 **Q.** We have also discussed the Flint River and the

20 Flint Basin that's represented in green on this

21 map. Right?

22 **A. Correct.**

23 **Q.** Okay. The Flint River forms just south of

24 Hartsfield Jackson Airport. Correct?

25 **A. Correct.**

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1 **Q.** And the task force looked at all possible

2 alternatives. Right?

3 **A. They were encouraged to look at all options.**

4 **Q.** If you will turn to tab 1 in your binder -- I

5 know you were just handed another copy; but you

6 should find your prefiled direct testimony. Do

7 you see that?

8 **A. I do.**

9 **Q.** If you turn to paragraph 62 that's on page 17,

10 here you know that there are 35 conservation

11 measures considered by the task force. Right?

12 **A. Correct.**

13 **Q.** And then there are six bullet points that you

14 list below that roughly provide categories for

15 the measures you considered. Correct?

16 **A. Correct.**

17 **Q.** The task force was statewide. Is that right?

18 **A. The task force included individuals from across**

19 **the state, but the focus of the work of the**

20 **contingency task force was primarily the metro**

21 **Atlanta region.**

22 **Q.** Were you told to exclude options that related to

23 agricultural water conservation?

24 **A. Considering that we were looking at metro Atlanta**

25 **and options that would replace access to Lake**

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1 **Lanier, the primary focus of the task force was**
 2 **metro Atlanta. No explicit direction given to**
 3 **exclude Ag; but given that there's not**
 4 **large-scale agriculture in the region, it was not**
 5 **reviewed.**
 6 **Q.** And the ultimate recommendations that the task
 7 force provided didn't address agricultural
 8 irrigation. Right?
 9 **A. It did not.**
 10 **Q.** And I mentioned this a moment ago. But the task
 11 force did provide its findings and
 12 recommendations in December of 2009. Right?
 13 **A. Correct.**
 14 **Q.** If you turn to tab 6 in your binder, do you
 15 recognize this as the findings and the
 16 recommendations for the task force?
 17 **A. I do.**
 18 **Q.** And you're familiar with the two primary sets of
 19 recommendations that are included in this report.
 20 Right?
 21 **A. I'm -- I'm very familiar with the findings. Yes.**
 22 **Q.** And I'm referencing the no regrets options and
 23 the contingency options.
 24 **A. Correct.**
 25 **Q.** And the no regrets options can be pursued

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1 regardless of the outcome of the legal
 2 proceedings. Right?
 3 **A. That is correct.**
 4 **Q.** And the contingency options, on the other hand,
 5 were only going to be pursued if Georgia was
 6 unsuccessful. Right?
 7 **A. I would actually say they were only going to be**
 8 **considered if Georgia was unsuccessful.**
 9 **Q.** So if we can look back at your tab 1, your
 10 prefiled testimony for a moment, we'll be
 11 flipping back to tab 6 here in a moment.
 12 So paragraph 65 should be the page before
 13 what we were on -- I'm sorry. It's page 16 --
 14 I'm sorry. Page 18.
 15 Are you there?
 16 You wrote and testified, Georgia implemented
 17 the no regrets option with the passage of the
 18 Water Stewardship Act. Correct?
 19 **A. They did.**
 20 **Q.** Georgia didn't implement all of the no regrets
 21 options when it passed the Water Stewardship Act.
 22 Did it?
 23 **A. I believe that many communities within the State**
 24 **of Georgia did, and the majority of the no**
 25 **regrets options were implemented within Georgia,**

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1 **yes.**
 2 **Q.** Let's look at those options, if you could go back
 3 to tab 6, and specifically page 9. In section
 4 3.1, do you recognize those as the no regrets
 5 options?
 6 **A. Those are the -- yes.**
 7 **Q.** It's some of them. Right?
 8 **A. Some of them.**
 9 **Q.** And, actually, if you will turn to page 10, there
 10 is a section entitled Enhanced Efficiency
 11 Programs. Do you see that?
 12 **A. I do.**
 13 **Q.** This is within the no regrets options. Right?
 14 **A. It is.**
 15 **Q.** The first bullet you see below Enhanced
 16 Efficiency Programs is for residential retrofit
 17 rebate programs, for things like toilets and
 18 showerheads and faucets. Do you see that?
 19 **A. I do.**
 20 **Q.** And I believe the Metro District implemented that
 21 recommendation. Right?
 22 **A. They have.**
 23 **Q.** It hasn't been implemented throughout all the
 24 other water districts in Georgia; has it?
 25 **A. There are no other water districts in Georgia.**

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1 **There are Regional Planning Councils.**
 2 **Q.** Have they been implemented throughout the
 3 Regional Planning Councils?
 4 **A. Not to my knowledge, no.**
 5 **Q.** Still on page 10, same JX-41, there is a section
 6 that says New Outdoor Water Usage Policies. Do
 7 you see that?
 8 **A. I do.**
 9 **Q.** This particular recommendation provides for
 10 rebate programs to retrofit existing residential
 11 commercial landscaping irrigation systems.
 12 Correct?
 13 **A. Correct.**
 14 **Q.** Essentially providing them with rain sensors.
 15 Correct?
 16 **A. Yes.**
 17 **Q.** That recommendation was not implemented either;
 18 was it?
 19 **A. Not on a statewide level.**
 20 **Q.** So the next recommendation on that page is
 21 multifamily sub-metering. Do you see that?
 22 **A. I do.**
 23 **Q.** And that relates to existing non sub-metered
 24 multifamily complexes. Correct?
 25 **A. That's correct.**

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1 **Q.** And the Water Stewardship Act mandated new
 2 multifamily housing to have sub-metering.
 3 Right?
 4 **A. Correct.**
 5 **Q.** But there was no provision for existing
 6 multifamily complexes. Right?
 7 **A. Correct.**
 8 **Q.** So that hasn't been implemented statewide.
 9 Correct?
 10 **A. Correct.**
 11 **Q.** If you look at the next page, page 12, you should
 12 see section 3.2. And down near the bottom it
 13 says Contingency Plan. Is this where the
 14 contingency options begin?
 15 **A. Yes.**
 16 **Q.** Great. And then if you will just turn to the
 17 next page, page 13, these are some additional
 18 recommendations in the contingency category.
 19 Correct?
 20 **A. Correct. Again, contingency means in the event**
 21 **Lake Lanier was not available for water supply.**
 22 **Q.** And Georgia did not implement these
 23 recommendations. Right?
 24 **A. There are mandated limits on outdoor water usage.**
 25 **So --**

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1 **Q.** Yes. We'll walk through specific ones.
 2 **A. Okay.**
 3 **Q.** But I understood your testimony to be that
 4 because the ruling was overturned, you didn't
 5 have to implement these. Correct?
 6 **A. Correct. That is correct.**
 7 **Q.** And it sounded like you have chosen to implement
 8 some of them. Right?
 9 **A. Yes.**
 10 **Q.** And chosen not to implement others. Right?
 11 **A. Correct.**
 12 **Q.** The first contingency option on page 13 is
 13 mandatory efficiency programs. Do you see those?
 14 **A. I do.**
 15 **Q.** And it's got four bullet points. Correct?
 16 **A. Correct.**
 17 **Q.** The second bullet is for replacement of fixtures.
 18 And it lists a number of different fixtures that
 19 are options. Do you see that?
 20 **A. I do.**
 21 **Q.** And the third bullet point is for retrofits for
 22 resale -- resold homes. Correct?
 23 **A. Yes.**
 24 **Q.** Neither of those options were implemented.
 25 Correct?

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1 **A. Repeat your question. I'm -- I noted the bullet**
 2 **about residential retrofit, but what was the**
 3 **other option?**
 4 **Q.** Just the second bullet point as well. Neither
 5 bullets 2 nor 3 were implemented. Correct?
 6 **A. No.**
 7 **Q.** The next recommendation, same page, is mandatory
 8 multifamily sub-metering. Do you see that?
 9 **A. I do.**
 10 **Q.** And, again, that was not implemented either.
 11 Correct?
 12 **A. Implemented in new construction.**
 13 **Q.** Implemented in new construction. And the
 14 mandatory multifamily sub-metering you see here
 15 is for existing --
 16 **A. Correct.**
 17 **Q.** -- construction. Correct?
 18 So this was not implemented?
 19 **A. It was not.**
 20 **Q.** If you will turn back to tab 1, paragraph 67.
 21 Again, this is your prefiled testimony.
 22 Do you see the sentence beginning, it is
 23 important to note, however?
 24 **A. Yes.**
 25 **Q.** There you identify contingency options like

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1 direct potable reuse and new reservoir
 2 construction that you say only made sense in the
 3 context of supply shortfall. Right?
 4 **A. Correct.**
 5 **Q.** The options that you list in paragraph 67, part 1
 6 that we just read, were they?
 7 **A. They were not.**
 8 **Q.** If you will turn back to tab 6, please, and to
 9 page 14, please. Do you see section 3.3 at the
 10 top has desirable policies that the task force
 11 recommended for consideration. Correct?
 12 **A. Correct.**
 13 **Q.** And there's six policies here, each one
 14 underlined?
 15 **A. Yes.**
 16 **Q.** And to your knowledge, there's been no further
 17 work on any of those six recommendations. Right?
 18 **A. There's one item here that has moved forward,**
 19 **which is where local communities are empowered**
 20 **with the ability to seek more stringent**
 21 **requirements than what the State imposes.**
 22 **Q.** Local communities have been empowered; but
 23 otherwise, none of these policies have been
 24 considered?
 25 **A. No.**

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1 **Q.** Okay. You testified earlier in your prefiled
 2 direct testimony that the task force made
 3 recommendations. And some of those were
 4 ultimately included in the Water Stewardship Act.
 5 Correct?
 6 **A. Correct.**
 7 **Q.** That was a statewide legislation. Right?
 8 **A. Correct.**
 9 **Q.** And you were involved in drafting that law.
 10 Right?
 11 **A. I was involved in the conversations around the**
 12 **law, yes.**
 13 **Q.** Before the Water Stewardship Act was passed,
 14 Georgia had faced criticism for its conservation
 15 policies. Right?
 16 **A. I'm not familiar, no.**
 17 **Q.** Do you recall that there was a drought in the ACF
 18 Basin in 2007-2008?
 19 **A. Yes.**
 20 **Q.** And do you recall Alabama's Governor, Bob Riley,
 21 criticizing Georgia's lack of conservation?
 22 **A. No.**
 23 **Q.** Do you recall Governor Riley criticizing Georgia
 24 because it did not impose an outdoor watering ban
 25 until after the summer of 2007?

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1 **A. No.**
 2 **Q.** You don't recall that?
 3 Could you turn to tab 5, please. This is
 4 Florida Exhibit 905. If you would turn to the
 5 second page, do you recognize SB 370 where it
 6 says bill number at the bottom?
 7 **A. Yes. I'm sorry.**
 8 **Q.** SB 370 is the Water Stewardship Act. Right?
 9 **A. Yes.**
 10 **Q.** And this is the legislative history for that Act.
 11 Correct?
 12 **A. I assume so. I have never seen this Act.**
 13 **Q.** And if you turn to the next page, do you see it
 14 starts with History?
 15 **A. Yes.**
 16 **Q.** It's the effective date of the Stewardship Act.
 17 Correct?
 18 **A. Yes.**
 19 **Q.** If you will -- we'll jump around a little bit.
 20 If you will turn to page 190 -- the page numbers
 21 are at the top left corner -- do you see the top
 22 of that first paragraph some of the criticisms I
 23 mentioned from Governor Riley?
 24 **A. This document certainly echos what you said.**
 25 **Q.** And do you see Georgia was also criticized

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1 because it ran its fountains and watered football
 2 fields more than a year into that drought?
 3 **A. This document certainly states that.**
 4 **Q.** And, again, this is the legislative history of
 5 the Water Stewardship Act. Right?
 6 **A. Again, never having seen this document, I cannot**
 7 **attest to whether this is a true and accurate**
 8 **legislative history of the bill.**
 9 **Q.** Do you see -- well, turn to page 187, please. If
 10 you look at the first full paragraph -- or first
 11 paragraph, I apologize, the sentence, as
 12 Georgia's demands.
 13 **A. Okay.**
 14 **Q.** Do you see that?
 15 It's discussing the increased demands for
 16 water supply. Correct?
 17 **A. It states that.**
 18 **Q.** And presumably that water was going to come from
 19 Lake Lanier. Right?
 20 **A. Given that Lake Lanier is our primary source for**
 21 **water supply, yes.**
 22 **Q.** Yes, absolutely.
 23 And so if you will turn to page 204 now, you
 24 will see a discussion entitled the Act's Impact
 25 on Negotiations with Florida and Alabama. Do you

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1 see that section?
 2 **A. I do.**
 3 **Q.** Will you just read the first paragraph silently
 4 to yourself.
 5 **A. Okay.**
 6 **Q.** And do you see that the Act was an effort to
 7 influence the ongoing negotiations with Florida
 8 and Alabama and the appeal of the litigation with
 9 Florida and Alabama. Do you see that?
 10 **A. I do see the sentence. Yes.**
 11 **Q.** And if you will just turn to the next page, do
 12 you see a section entitled Criticisms of the Act
 13 and Issues Unresolved by the Act?
 14 **A. I do.**
 15 **Q.** Just in this first couple sentences, do you see
 16 the legislators agreed the Act should have been
 17 passed years earlier. Right?
 18 **A. I see that statement.**
 19 **Q.** So let's talk about the actual provisions of the
 20 Water Stewardship Act. If you would look at
 21 tab 7 in your binder, you should see GX-294. Let
 22 me know when you're there.
 23 **A. I'm there.**
 24 **Q.** Do you recognize this to be the Water Stewardship
 25 Act?

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1 **A. I do.**

2 **Q.** The Stewardship Act was created to -- or was

3 passed to create a culture of water conservation.

4 Right?

5 **A. That is correct.**

6 **Q.** And section 3, which is on page 4 of this

7 document, do you see the portion of the Act that

8 addressed water loss?

9 **A. In section 3?**

10 **Q.** It should be section 3.

11 **A. Section 3 appears to be definitions. No?**

12 **No. Okay.**

13 **Q.** I think it's just definitions, and then it

14 addresses water loss. Correct?

15 **A. That's correct.**

16 **Q.** Do you see about halfway down on that page in

17 the (b)?

18 **A. Give me a line number.**

19 **Q.** You can look starting at 119. Do you see those

20 five examples?

21 **A. I do.**

22 **Q.** And they are some of the water loss policies that

23 the Act was putting forward?

24 **A. Yes.**

25 **Q.** And it included infrastructure, leakage index,

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1 water loss audits, loss detection. Right?

2 **A. Yes.**

3 **Q.** None of those policies require Georgia to fix any

4 leaks; do they?

5 **A. As written in 2010 when this was passed, it did**

6 **not. But subsequently the State of Georgia in**

7 **2015 did pass the Georgia Water Use and**

8 **Efficiency Act or regulations that required**

9 **demonstrated progress. So yes.**

10 **Q.** And Georgia would agree that leak abatement and

11 preventing water loss is a good thing. Right?

12 **A. Yes.**

13 **Q.** And you mentioned the Water Supply Efficiency

14 Rules were passed in 2015. Correct?

15 **A. Correct.**

16 **Q.** If you look back up on this page just a little

17 bit where the section (b) is, do you see the

18 Board of Natural Resources was supposed to pass

19 that rule January 1st of 2011. Correct?

20 **A. It specifically states for monitoring improving**

21 **the efficiency and effectiveness of water use. I**

22 **don't believe it contains there that it**

23 **demonstrated progress.**

24 **Q.** And the Water Supply Efficiency Rules in 2015,

25 they did exactly that; they set those minimum

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1 standards. Right?

2 **A. They set standards by which utilities need to**

3 **demonstrate progress on their audits -- in**

4 **response to their audits.**

5 **Q.** The Water Stewardship Act, that also implemented

6 new outdoor watering restrictions. Right?

7 **A. Correct.**

8 **Q.** Again, we talked about the 2007 and 2008

9 droughts. Do you recall that?

10 **A. I do.**

11 **Q.** And during that drought, Georgia ultimately

12 invoked an outdoor watering ban. Correct?

13 **A. They did.**

14 **Q.** And that led to a decrease in Atlanta's water

15 consumption. Correct?

16 **A. Correct.**

17 **Q.** The Water Stewardship Act did not have provisions

18 for a complete water ban. Right?

19 **A. It did not.**

20 **Q.** It only contained limitations on daytime

21 watering. Right?

22 **A. It took a substantial step forward by limiting**

23 **water usage between 10 a.m. and 4 p.m. every day**

24 **of the week.**

25 **Q.** You're still in tab 7. Correct?

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1 **A. I am.**

2 **Q.** If you look at section 4, I think you will find

3 the limitations on daytime watering.

4 Specifically it's on page 6, if that's helpful.

5 **A. Correct.**

6 **Q.** And as you said, it limited watering from 4 p.m.

7 to 10 a.m. Correct?

8 **A. 10 a.m. to 4 p.m. you could not.**

9 **Q.** You could not. So the watering was from 4 p.m.

10 to 10 a.m.

11 Below that you see a list of several

12 exceptions starting at line 186. Correct?

13 **A. Yes.**

14 **Q.** Among them, drip irrigation, watering of athletic

15 fields, watering of golf courses, and commercial

16 agricultural irrigation. Correct?

17 For those exceptions, you could water at any

18 time still. Correct?

19 **A. That is correct.**

20 **Q.** And there is nothing in this Act that limited the

21 amounts someone could water. Correct?

22 **A. Correct.**

23 **Q.** I just mentioned there is a specific exception

24 for commercial agricultural irrigation. Right?

25 **A. Correct.**

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1 Q. It's line 186. That included the large-scale
 2 operations like center-pivot irrigation and drip
 3 irrigation. Right?
 4 A. **I would have to refer back to code section 1-3-3.**
 5 Q. You don't have a recollection as to what was
 6 meant by commercial agricultural irrigation?
 7 A. **I don't.**
 8 Q. I might refresh you with your deposition
 9 testimony, if that's helpful.
 10 A. **Sure.**
 11 Q. So if you will turn to tab 2 in your binder --
 12 and I know you were deposed twice in this case.
 13 This is the first of those two in January of this
 14 year.
 15 And you swore to tell the truth there.
 16 Correct?
 17 A. **Correct.**
 18 Q. So if you will look at the transcript at page
 19 159, line 13.
 20 A. **Page 159?**
 21 Q. Correct.
 22 A. **Okay. 159. What line?**
 23 Q. So if you look at lines 13 through to the next
 24 page 162, you will see the discussion that is
 25 referencing this.

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1 Specifically, do you see you testified, and
 2 when you refer to commercial agricultural
 3 irrigation options --
 4 A. **Yes, I do.**
 5 Q. -- I'm using the term large-scale like drip
 6 irrigation, center-pivot irrigation type of
 7 operations.
 8 A. **Yes. So that refreshes my memory.**
 9 Q. Okay. So that's what was included in that
 10 exception. Correct?
 11 A. **I believe so.**
 12 Q. And are you aware of conversations specific to
 13 that exception?
 14 A. **I am not.**
 15 Q. You weren't part of any efforts to make sure that
 16 that was included in the Stewardship Act?
 17 A. **I was not.**
 18 Q. I want to talk now about Georgia's responses to
 19 droughts after the Water Stewardship Act was
 20 passed. So you -- you're aware there was a
 21 drought in 2011-2012 as well. Correct?
 22 A. **I am.**
 23 Q. Are you aware EPD did not declare a drought in
 24 Georgia in either of those years?
 25 A. **I am.**

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1 Q. And, therefore, EPD did not institute an outdoor
 2 watering ban. Right?
 3 A. **Correct.**
 4 Q. Now, the same management tools were available in
 5 2011 and 2012 as were available in '07 and '08.
 6 Right?
 7 A. **Correct.**
 8 Q. Were you aware that the 2011-2012 drought was
 9 more in the southwestern part of Georgia?
 10 A. **I am.**
 11 Q. And is it your understanding that EPD did not
 12 invoke its drought management tools in Atlanta to
 13 address drought in other parts of the ACF?
 14 A. **At that point that's a decision that EPD is given**
 15 **the authority to make. So I have no**
 16 **understanding of why they made the decisions they**
 17 **did in 2010 and 2012. I couldn't speak to those**
 18 **decisions. They have the authority to make**
 19 **those.**
 20 Q. Nothing preventing them from using drought tools
 21 in Atlanta if there's a drought in other parts of
 22 the state. Right?
 23 A. **They had discretion to implement drought rules.**
 24 Q. Ms. Kirkpatrick, you also testified about some of
 25 the management plans that the Metro District puts

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1 out from time to time. Correct?
 2 A. **Yes.**
 3 Q. I believe they're supposed to be about every five
 4 years. Right?
 5 A. **About.**
 6 Q. And in developing those plans, Metro District
 7 doesn't consider how much water is actually
 8 flowing downstream to reservoirs past Atlanta;
 9 does it?
 10 A. **It does in some ways. There are certainly -- a**
 11 **flow target at Peachtree Creek that must be taken**
 12 **into consideration. I also think by implementing**
 13 **conservation measures, that some of the other**
 14 **activities that are prescribed in our plans,**
 15 **there is a consideration. But it isn't a driving**
 16 **determination for the plan development.**
 17 Q. Okay. In developing its plans, the water
 18 district doesn't consider how much water flows to
 19 downstream Corps reservoirs. Correct?
 20 A. **They are not prescribed to do so by the**
 21 **legislation.**
 22 Q. It's not part of the planning process. Correct?
 23 A. **Well, I -- I would take exception with that.**
 24 **They're certainly mindful of downstream,**
 25 **especially when you're contemplating conservation**

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1 **measures and return flows and some of the other**
 2 **aspects of our plans. I do think that those**
 3 **communities that are downstream does influence.**
 4 **But it is not driven by a targeted number or**
 5 **releases. The Corps of Engineers controls those.**
 6 **Q.** Okay. If you will turn to tab 3 in your binder,
 7 again, you mentioned you gave a couple
 8 depositions. This is going to be from your
 9 second, February 2016.
 10 And, again, you swore to tell the truth at
 11 that deposition. Correct?
 12 **A. Correct.**
 13 **Q.** And there was a court reporter there who took
 14 down your testimony?
 15 **A. Correct.**
 16 **Q.** Can you look at page 38, lines 4 through 7.
 17 You were asked, in developing this plan, does
 18 the water district consider how much water will
 19 flow to those downstream Corps reservoirs?
 20 Your answer, no.
 21 **A. That's correct.**
 22 **Q.** Were you asked that question, and did you give
 23 that answer?
 24 **A. Absolutely.**
 25 **Q.** And when the Metro District puts its water
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1 management plan together, it also doesn't
 2 consider impacts to species that occupy habitats
 3 downstream. Right?
 4 **A. That's correct.**
 5 **Q.** Can you turn to tab 9 in your binder. It's
 6 FX-313. Do you recognize this document?
 7 **A. I do.**
 8 **Q.** This is put together by the Chattahoochee
 9 Riverkeeper. Correct?
 10 And it's from September 2012, I believe.
 11 **A. It says 2012.**
 12 **Q.** Okay. If you flip to the next page, you should
 13 see a date of September 2012 after the
 14 acknowledgments.
 15 And in the acknowledgment section, if you
 16 look at the second paragraph after the word
 17 acknowledgements, do you see that?
 18 **A. I'm sorry. Repeat your question.**
 19 **Q.** Sure. If you're on the second page of the
 20 document, do you see where it says
 21 acknowledgments?
 22 **A. I do.**
 23 **Q.** In the second paragraph there, there is a
 24 reference to thanking Steve Haubner from the
 25 Metro District. Do you see that?
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1 **A. I -- you would have to -- oh, yes, I do. Sorry.**
 2 **Q.** And that's the same Metro District we have been
 3 discussing. Right?
 4 **A. That is correct.**
 5 **Q.** And, again, this is from September; so it's a
 6 couple years after the Water Stewardship Act was
 7 passed. Right?
 8 **A. Correct.**
 9 **Q.** If you will turn to page 9 -- the pages here are
 10 in the bottom right corner, I believe -- you
 11 should see a section on Water Loss. Just at the
 12 top of the page, if you will read the first
 13 couple sentences silently.
 14 And this describes the Water Stewardship Act
 15 has modest legislation. Correct?
 16 **A. It is so stated here, yes.**
 17 **Q.** Would you turn now to page 18 of the same
 18 document. You should see a section that's
 19 entitled Reduce Outdoor Water Use. Are you
 20 there?
 21 **A. I am.**
 22 **Q.** Great. In the first paragraph, do you see it
 23 notes the same daytime watering restrictions that
 24 we spoke about earlier?
 25 **A. Can you point precisely where you are?**
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1 **Q.** Sure. It's just the first paragraph of that
 2 section, Reduce Outdoor Water Use.
 3 **A. I do.**
 4 **Q.** And it notes that there are so many exceptions
 5 that it, quote, appears to virtually undue any
 6 benefit of the Water Stewardship Act. Right?
 7 **A. This document says that, yes.**
 8 **Q.** So earlier we talked a little bit about the Upper
 9 Flint as well. Do you recall that?
 10 **A. We did.**
 11 **Q.** The Upper Flint is still contained in the Metro
 12 District. Right?
 13 **A. Correct.**
 14 **Q.** The source of the Flint River, just for context,
 15 is in the Clayton and Fulton County areas. Is
 16 that right?
 17 **A. Correct.**
 18 **Q.** And then obviously it flows down all the way to
 19 Florida.
 20 Your testimony focuses on the Chattahoochee
 21 River and Lake Lanier. Right?
 22 **A. Correct.**
 23 **Q.** If you will turn to tab 11, please, FX-241. You
 24 should see a letter to then EPD Director Turner.
 25 Do you see that?
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- 1 **A. I do.**
- 2 **Q.** This is from the Flint riverkeeper. Are you
- 3 familiar with him?
- 4 **A. I am.**
- 5 **Q.** Have you seen this particular document before?
- 6 **A. I have not.**
- 7 **Q.** Okay. If you will just turn to page 5, the first
- 8 sentence of the first full paragraph on that
- 9 page, do you see where it indicates that the
- 10 several tributaries in the Upper Flint have run
- 11 dry?
- 12 **A. It states that.**
- 13 **Q.** Is that something you were aware of?
- 14 **A. No.**
- 15 **Q.** One of the concerns listed here in the next
- 16 paragraph is the return rate, a low return rate
- 17 on water withdrawals. Do you see that?
- 18 **A. Are you in the second full paragraph?**
- 19 **Q.** Second full paragraph, yes.
- 20 **A. I do see a stated reference to return flows.**
- 21 **Q.** Is that something you were aware of?
- 22 **A. Not substantively, not at depth in regards to**
- 23 **this specific letter.**
- 24 **Q.** That wasn't something that the Metro District
- 25 took into account in its water management plans?

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- 1 **A. Correct.**
- 2 **Q.** Do you see the section Why is This Work
- 3 Important?
- 4 **A. I do.**
- 5 **Q.** It's a long section. But I just want to point
- 6 out a couple points.
- 7 Do you see in the second sentence of the
- 8 third full paragraph, it notes declining
- 9 baseflows even in the absence of drought. Right?
- 10 **A. It states that.**
- 11 **Q.** And is that something the Metro District was
- 12 aware of?
- 13 **A. The Metro District certainly looks at all six**
- 14 **river systems when doing planning.**
- 15 **Q.** Okay. The first bullet point in this section
- 16 assesses 70 percent lower flows on the mainstem
- 17 of the Flint River. Do you see that?
- 18 **A. I do.**
- 19 **Q.** And then the last bullet suggests that demand on
- 20 the river for public water supply is part of the
- 21 reason why. Right?
- 22 **A. It states that.**
- 23 **Q.** And then the next page, the first bullet also
- 24 suggests that low return rates are part of the
- 25 reason why. Correct?

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- 1 **A. No. I can speak to that. But as regarding to**
- 2 **this document, I --**
- 3 **Q.** You just didn't know the specifics of it?
- 4 **A. I can't speak to the Flint riverkeeper's intent.**
- 5 **Q.** Okay. Do you see it indicates in the first
- 6 sentence of this second full paragraph that the
- 7 decrease in streamflow is partly attributable to
- 8 consumptive use in the Metro District?
- 9 **A. It's -- are you talking about the sentence, the**
- 10 **reasons for the decrease?**
- 11 **Q.** Sure. And specifically it notes increasing water
- 12 withdrawals and the lack of return flows to the
- 13 system.
- 14 **A. It certainly states that.**
- 15 **Q.** Are you familiar with American Rivers?
- 16 **A. I am.**
- 17 **Q.** Will you turn to tab 10 now in your binder.
- 18 This is an action plan that they put
- 19 together; correct?
- 20 **A. That's what it says, yes.**
- 21 **Q.** It's dated October 2014. Right?
- 22 **A. Yes.**
- 23 **Q.** Can you please turn to page 4. And, again now,
- 24 October 2014 is four days after the Water
- 25 Stewardship Act was passed. Right?

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- 1 **A. It states that.**
- 2 **Q.** And, again, this is a document put together by
- 3 the Chattahoochee riverkeeper. Right?
- 4 **A. No.**
- 5 **Q.** I'm sorry. This is American Rivers. Correct?
- 6 **A. Correct. American Rivers.**
- 7 **Q.** So we looked at a Flint riverkeeper document and
- 8 a Chattahoochee riverkeeper document. Correct?
- 9 **A. Correct.**
- 10 **Q.** And those are the two primary rivers in the ACF
- 11 Basin. Right?
- 12 **A. Correct.**
- 13 **Q.** And then if you will turn to tab 12, FX-903, this
- 14 is an article from April of this year. Correct?
- 15 **A. It is.**
- 16 **Q.** Are you familiar with this?
- 17 **A. The article?**
- 18 **Q.** Yes.
- 19 **A. I don't believe I have read this article, no.**
- 20 **Q.** Were you aware American Rivers announced that the
- 21 ACF was the most endangered river system in the
- 22 country?
- 23 **A. Yes.**
- 24 **Q.** In the fifth paragraph down in this article, do
- 25 you see that it notes rivers in the basin are so

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1 heavily exploited that some run at drought flows
 2 even in normal years. Correct?
 3 **A. That's what it states.**
 4 **Q.** And American Rivers is an -- is an environmental
 5 nonprofit that you cited to in your prefiled
 6 testimony. Right?
 7 **A. Yes.**
 8 **Q.** So you think that they're credible. Right?
 9 The bottom paragraph, American Rivers
 10 identifies the chief threat to the basin as
 11 increasing and unsustainable water use. Do you
 12 see that?
 13 **A. I do.**
 14 **Q.** Okay. And this is despite all the conservation
 15 measures that you have discussed in your
 16 testimony. Right?
 17 **A. And that's what this states.**
 18 **Q.** Ms. Kirkpatrick, let's go back to what can
 19 actually be done in Atlanta. In your prefiled
 20 testimony, which again is tab 1, I want to direct
 21 your attention to page 20, specifically paragraph
 22 72. Are you there?
 23 I'll let you find it.
 24 You testified that any cap on water
 25 consumption in metro Atlanta, whether at extreme

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1 1992 levels or at higher amounts, would threaten
 2 the existing population and future population.
 3 Do you see that?
 4 **A. I do.**
 5 **Q.** So it's your view that there can be absolutely no
 6 limit on Atlanta's water use?
 7 **A. No. I think my view here is that a cap at**
 8 **existing consumption or at higher rates could**
 9 **threaten Metro Atlanta's viability -- economic**
 10 **viability.**
 11 **Q.** Will you look at the next sentence as well,
 12 please, and read that to yourself.
 13 So that's addressing Georgia's consumption as
 14 well. Right?
 15 **A. True.**
 16 **Q.** So your view is that there can be no cap on
 17 Georgia's consumption or Atlanta's consumption.
 18 Right?
 19 **A. I believe a cap could have drastic economic**
 20 **impacts on the State of Georgia as well as metro**
 21 **Atlanta.**
 22 **Q.** Is there any point at which a limit on Georgia's
 23 or Atlanta's consumption is appropriate?
 24 **A. I believe that good planning, demand forecasting,**
 25 **combined with conservation measures is an**

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1 **appropriate response to drive what the U.S. Army**
 2 **Corps of Engineers does in management of the ACF**
 3 **system. So I believe that's the more accurate**
 4 **response.**
 5 **Q.** So no limit would be appropriate. Right?
 6 **A. I believe here that -- I believe that an**
 7 **artificial cap would impose harm on both Georgia**
 8 **and metro Atlanta.**
 9 **Q.** If you will just -- you're aware of the ACF
 10 Compact negotiations. Correct?
 11 **A. In what context?**
 12 **Q.** Just in the 1990's and 2000's there was a
 13 negotiation between Alabama, Florida, and
 14 Georgia. Correct?
 15 **A. I'm aware negotiations took place, yes.**
 16 **Q.** And I don't have any reason to believe you were
 17 part of those negotiations.
 18 **A. I was not.**
 19 **Q.** Will you turn to tab 13, please. It's FX-199.
 20 And on page 4 of this document, do you see
 21 statements by Bob Kerr?
 22 **A. I do.**
 23 **Q.** Are you familiar with Mr. Kerr?
 24 **A. I know Mr. Kerr.**
 25 **Q.** He was one of the chief negotiators for Georgia.

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1 Correct?
 2 **A. That's correct.**
 3 **Q.** And if you will look at Mr. Kerr's comments, I
 4 want to direct your attention to the middle of
 5 that paragraph, the section that says, but we
 6 have always said. Do you see that?
 7 **A. I do.**
 8 **Q.** And Mr. Kerr said that they will not agree to any
 9 consumptive use limit. Correct?
 10 **A. That's what it states here.**
 11 **Q.** And this was back in 2002. Right?
 12 **A. Yes.**
 13 **Q.** And that's still your position now. Right?
 14 **A. I cannot attest to the position as related here.**
 15 **I wasn't privy to this. I don't know, again,**
 16 **what's gone on in negotiations or compacts. So I**
 17 **can't attest to that.**
 18 **Q.** But your position is that there is no appropriate
 19 consumptive limit. Right?
 20 **A. I believe that when you plan appropriately and**
 21 **you look at your demand forecasting with your**
 22 **population growth, your employment growth,**
 23 **conservation measures, then you can appropriately**
 24 **plan for water supply for the region. And that**
 25 **will include an increase.**

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1 **Q.** Yes or no, any cap on consumptive use in Atlanta
 2 and Georgia would be --
 3 **A. I think an artificial cap would be devastating.**
 4 **Q.** No further questions.
 5 MR. ALLEN: Your Honor, before I start,
 6 why don't I recommend that we take a break
 7 and come back?
 8 SPECIAL MAGISTRATE LANCASTER: Claudette?
 9 COURT REPORTER: Sure.
 10 MR. ALLEN: Thank you, your Honor.
 11 (Time Noted: 3:00 p.m.)
 12 (Recess Called)
 13 (Time Noted: 3:10 p.m.)
 14 SPECIAL MASTER LANCASTER: Go ahead,
 15 counsel.
 16 MR. ALLEN: Good afternoon, your Honor.
 17 I'll get started.
 18 REDIRECT EXAMINATION
 19 BY MR. ALLEN:
 20 **Q.** Now, Ms. Kirkpatrick, as we mentioned, you served
 21 on the Metro Water District. Correct?
 22 **A. I served on the governing board, yes.**
 23 **Q.** And, Ms. Kirkpatrick, when you serve on the
 24 governing board of the Metro District, are you
 25 working as a lobbyist?

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1 **A. Yes. It's pretty simple. You have two major**
 2 **steps, the first of which is developing demand**
 3 **projections and then preparing your plans**
 4 **accordingly. I'm primarily the water**
 5 **conservation and supply plan.**
 6 **Q.** You mentioned demand projection and water
 7 conservation. I'm going to talk about each of
 8 those, but I want you to tell us a little bit
 9 about the process through which the District goes
 10 when it actually develops one of these plans.
 11 What does it do? Who does it meet with?
 12 **A. So it starts by hiring a consultant, an**
 13 **engineering firm. Then the demand projections**
 14 **are prepared, and that includes looking at**
 15 **population forecasts and employment forecasts.**
 16 **It works with the State of Georgia as well on**
 17 **ensuring those numbers are based on recent data,**
 18 **as well as the Atlanta Regional Commission. It**
 19 **also works with stakeholders, the public,**
 20 **technical coordinating committee, and the**
 21 **governing board to utilize those demand**
 22 **projections to prepare the plans.**
 23 **Q.** Okay. And you said the plans are done about
 24 every five years roughly. Correct?
 25 **A. Correct.**

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1 **A. I am not. I'm -- I'm working in my professional**
 2 **capacity as an environmental engineer.**
 3 **Q.** Okay. And are you working as a lobbyist today?
 4 **A. No.**
 5 **Q.** Are you being paid or compensated in any way for
 6 your testimony here today?
 7 **A. No.**
 8 **Q.** Okay. Ms. Kirkpatrick, you know, there's been
 9 some discussion of the Metro Water District; but
 10 I'm not sure we have heard what it is. So could
 11 you tell us just what is the Metro Water
 12 District?
 13 **A. Yes. The Metro Water District is a planning**
 14 **entity that includes 15 counties and 93 cities**
 15 **within the metro Atlanta region. And it is --**
 16 **has the direction to prepare plans -- water plans**
 17 **for the region.**
 18 **Q.** And when was it formed?
 19 **A. It was formed by legislation in 2001.**
 20 **Q.** And these plans you mentioned, how often are they
 21 done?
 22 **A. They are updated approximately every five years.**
 23 **Q.** And if you would, tell us a little bit about the
 24 process that goes into developing these plans and
 25 promulgating them.

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1 **Q.** So what planning cycles have there been?
 2 **A. The first plans were issued in 2003. The second**
 3 **set of plans were issued in 2009. And we're**
 4 **currently working on the next round of plans and**
 5 **anticipate issuing those in 2017.**
 6 **Q.** And I think you said that the main components of
 7 the plans are one bucket is kind of demand
 8 projections, stuff like that; and another bucket
 9 are conservation measures. Is that fair?
 10 **A. That's fair, yes.**
 11 **Q.** All right. Let's take those one at time, and
 12 let's start with the demand projections. Tell us
 13 what kind of effort does the District take to get
 14 those projections -- well, first of all, tell us
 15 what demand projections are.
 16 **A. Sure. Well, you know, simply it's how much water**
 17 **is an individual going to use in the region. So**
 18 **looking at -- you know, you could take myself,**
 19 **how much water would I use on a daily basis, and**
 20 **projecting out to 2050, and determining how much**
 21 **water the community would need at the end of that**
 22 **time period.**
 23 **Q.** And what kind of effort does the District take to
 24 make sure it gets those projections correct?
 25 **A. It's a pretty thorough process, again, utilizing**

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1 **data that is created by the Atlanta Regional**
 2 **Commission, the Office of Planning and Budget by**
 3 **which the State of Georgia uses those numbers to**
 4 **plan for a variety of other initiatives within**
 5 **the state. And again, it's a public transparent**
 6 **process. And it usually drives -- those demand**
 7 **projections drive the conversation around**
 8 **conservation measures.**
 9 Q. All right. Let's talk about conservation
 10 measures. Now, are --- these conservation
 11 measures that you mentioned, are they voluntary
 12 or are they mandatory?
 13 A. **They're mandatory.**
 14 Q. And who are they imposed on?
 15 A. **The local utilities that exist within the Metro**
 16 **Water District. So every municipal utility that**
 17 **resides within those 15 counties, and there's 93**
 18 **cities, is required to adopt those water**
 19 **conservation measures.**
 20 Q. And tell us, if you would, when these
 21 conservation measures were first adopted and
 22 imposed by the Metro Water District?
 23 A. **So the first round were adopted and imposed in**
 24 **2003.**
 25 Q. And have they been in place every year since

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1 2003?
 2 A. **Absolutely, and then built upon.**
 3 Q. Okay. I know there is a whole suite of
 4 conservation measures, but can you tell us about
 5 a few of them?
 6 A. **Sure. You could start with conservation pricing.**
 7 **A second example would be water loss, water**
 8 **audit. A third would be retrofit of fixtures.**
 9 Q. Okay. I want to talk about a few of those and
 10 why you picked those out. Can we start by
 11 talking about conservation pricing. Can you tell
 12 us what that is?
 13 A. **Yes. Conservation pricing, simply the more water**
 14 **you use, the more water you -- I mean, the more**
 15 **money you pay. And it sends a price signal to**
 16 **the consumer, whether or not that's a residential**
 17 **consumer or commercial, to use less water.**
 18 Q. And what portion of the Metro Water District's
 19 customers are covered by conservation pricing?
 20 A. **100 percent.**
 21 Q. And if you know, how do Atlanta's water and sewer
 22 rates compare to water and sewer rates in other
 23 parts of the country?
 24 A. **So the City of Atlanta has the highest water and**
 25 **sewer rates in the country.**

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1 Q. Ms. Kirkpatrick, another item you mentioned was
 2 water audits. Do you recall that?
 3 A. **I do.**
 4 Q. Tell us what that is.
 5 A. **Again, it's where a local utility will look at**
 6 **their infrastructure or their pipes that are in**
 7 **the ground and assess how much water may be lost**
 8 **from those pipes, either because they're aging or**
 9 **connections aren't tight, and determine where**
 10 **they have those leaks and develop a plan of**
 11 **action to correct them.**
 12 Q. And how long has that been a requirement in the
 13 Water District?
 14 A. **2003.**
 15 Q. Are you familiar with the IWA?
 16 A. **I am.**
 17 Q. And do they have some kind of connection to the
 18 water auditing process?
 19 A. **They do. It's a -- it's a national organization**
 20 **that puts together best professional practices**
 21 **for performing leak audits and protection, widely**
 22 **regarded within the industry as the standard by**
 23 **which to conduct your water loss audits. And as**
 24 **a matter of fact, in their most recent update of**
 25 **that manual just two months ago, they highlighted**

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1 **the efforts of the State of Georgia as it relates**
 2 **to water loss audits as a national example of**
 3 **what good process is.**
 4 Q. All right. And the third item, Ms. Kirkpatrick,
 5 you mentioned that has been a conservation
 6 measure that's been in place in the Metro
 7 District since 2003 was retrofitting fixtures.
 8 Do you remember that?
 9 A. **I do.**
 10 Q. Tell us what that is.
 11 A. **Yes. It's simply, you know, if you look inside a**
 12 **house, your fixtures, such as toilets,**
 13 **showerheads, faucets, are often inefficient if**
 14 **your home is older. And so there's been an**
 15 **encouragement -- and, actually, quite honestly,**
 16 **beyond encouragement, there has been replacement**
 17 **of faucets, showerheads, and toilets. And**
 18 **interestingly on the toilet retrofit, there's**
 19 **been a program in place now that's resulted in**
 20 **over 110,000 toilets being replaced that has**
 21 **resulted in over 900 million gallons per year**
 22 **being saved.**
 23 Q. Okay. Ms. Kirkpatrick, we talked about a few of
 24 the conservation measures that the Metro District
 25 has had in place since 2003. And I just want to

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1 be clear about this. What population in the

2 Metro District relies on ACF waters for their

3 municipal and industrial needs?

4 **A. I believe it's 4.1 million people.**

5 **Q.** Okay. So 4.1 million people reside in the

6 District and rely on ACF water for their needs.

7 Correct?

8 **A. That's correct. The vast majority, yes, of the**

9 **basin.**

10 **Q.** All right. And these conservation measures that

11 we're talking about that have been in place in

12 the Metro District, are those measures enforced?

13 **A. Absolutely.**

14 **Q.** How are they enforced?

15 **A. So when the District was created by law, the**

16 **legislators gave the Georgia Environmental**

17 **Protection Division the enforcement capability to**

18 **not reissue or renew or allow new permits to be**

19 **issued to any utility within the Metro Water**

20 **District that was not complying with the**

21 **conservation measures or any other aspect of the**

22 **plan.**

23 **Q.** And you mentioned that these planning cycles

24 happen on a five-year cycle. And I want to ask

25 you is there anything done between these

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1 **years of activity. And I think it demonstrates**

2 **that just as time goes on, more progress has been**

3 **made.**

4 **Q.** Ms. Kirkpatrick, has the District received any

5 awards or recognitions for its water conservation

6 efforts?

7 **A. They have.**

8 **Q.** What has it received?

9 **A. So EPA has a program called WaterSense. Over, I**

10 **believe, 1500 entities participate in that**

11 **program. And the Metro Water District received**

12 **an award in 2015 for their education and**

13 **awareness work, and then in 2016 they also**

14 **received an award for their promotional**

15 **partnership of WaterSense appliance.**

16 **Q.** Okay. Ms. Kirkpatrick, I want to talk a little

17 bit about the current planning cycle that's going

18 on right now in the Metro Water District. As

19 part of that work, has the District projected

20 what its water needs will be into the future?

21 **A. It has.**

22 **Q.** What do those projections show?

23 **A. So, interestingly, when you sit down and look at**

24 **employment forecasting and population forecasting**

25 **and compare that with the 2009 forecasts that**

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1 five-year cycles to monitor how the plans are

2 being implemented?

3 **A. Yes.**

4 **Q.** And what is that?

5 **A. So each year the water district produces**

6 **reports -- activities and implementation reports**

7 **that are provided to the Georgia General Assembly**

8 **and provided to the Georgia Environmental**

9 **Protection Division, and they're also provided to**

10 **the public to -- to view what progress has been**

11 **made. And they identify the progress on a**

12 **variety of measures within those reports.**

13 **Q.** And, Ms. Kirkpatrick, has the Metro District --

14 does it have any knowledge about what impact

15 these conservation measures have had on

16 consumptive water use -- M & I consumptive water

17 use in the Atlanta area?

18 **A. We do.**

19 **Q.** And what do you know about that?

20 **A. So if you look back in the history, it's been in**

21 **place for about 15 years now. And we have seen**

22 **that per capita use has gone down by 30 percent**

23 **and that our withdrawals have even decreased as**

24 **well, and again 30 percent and 10 percent. And**

25 **that's quite significant when you look at 15**

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1 **were prepared for that round of plans, it**

2 **demonstrates that our water demand will decrease**

3 **by 25 percent as compared to the demand projected**

4 **in 2009.**

5 **Q.** I just want to be very clear about this. So the

6 future demands you're projecting now is 25

7 percent lower than the future demand that had

8 been projected in 2009?

9 **A. That's correct.**

10 **Q.** Okay. And how aggressive or conservative is the

11 District being with respect to these projected

12 future demands?

13 **A. They're being conservative. And what -- again,**

14 **they began with population and employment. They**

15 **also factor in the existing conservation**

16 **measures. But they don't include what might come**

17 **in terms of additional conservation measures to**

18 **ensure that we are preparing a conservative**

19 **future-demand forecast.**

20 **Q.** Okay. Ms. Kirkpatrick, I want to shift briefly

21 and talk about a topic that has come up in some

22 of Florida's experts' testimony; and that has to

23 do with something called interbasin transfers.

24 Can you briefly explain to the Court what an

25 interbasin transfer is and why it happens?

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1 **A. Yes. So pretty simple, an interbasin transfer is**
 2 **when you withdraw water from one river or one**
 3 **basin, it goes into the distribution system for**
 4 **the utility. It's used by the consumer. It is**
 5 **then collected, highly treated, and then returned**
 6 **to a different basin or a different river.**
 7 **Q.** And why might that happen?
 8 **A. For a variety of reasons, the first of which is**
 9 **geography. The way our systems and our**
 10 **communities and our political boundaries have**
 11 **been built, they don't necessarily align with**
 12 **your watersheds. And so oftentimes the way the**
 13 **community has been built and grown, it requires**
 14 **water to be withdrawn from one basin or one water**
 15 **source and used and then treated in another**
 16 **facility.**
 17 **Q.** Okay. Certain of Florida's experts in this case
 18 have conducted analyses where they assume an over
 19 50 percent increase in interbasin transfers in
 20 the Metro Water District going forward. Do you
 21 agree that that's a fair assumption?
 22 **A. I do not agree that's a fair assumption.**
 23 **Q.** And why not?
 24 **A. Well, looking back at the 2001 law that created**
 25 **the Water District, it actually restricts the**

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1 **Water District from studying and planning for**
 2 **interbasin transfers into the District from**
 3 **outside its boundaries, No. 1. No. 2, in the**
 4 **2009 plan update that was issued, it includes a**
 5 **clear guidance that says that the District will**
 6 **minimize interbasin transfers going forward.**
 7 **And, third, there was guidance provided by the**
 8 **Environmental Protection Division in 2015 for the**
 9 **Water District that, again, requires that they**
 10 **minimize interbasin transfers in their planning**
 11 **process.**
 12 **Q.** Okay. So what, if any, increase in interbasin
 13 transfers does the District project will occur
 14 through 2015?
 15 **A. Zero.**
 16 **Q.** There's also been a suggestion by Florida's
 17 experts in this case that Georgia eliminate what
 18 they call net basin exports. That -- do you have
 19 a reaction -- in particular that's been a
 20 suggestion made by Dr. Sunding. Do you have a
 21 reaction to Dr. Sunding's proposals that Atlanta
 22 completely eliminate interbasin transfers or net
 23 basin exports?
 24 **A. That wouldn't be feasible.**
 25 **Q.** And I just want to ask you a couple questions

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1 about that.
 2 And, ma'am, are you an engineer?
 3 **A. I am.**
 4 **Q.** And why do you say it wouldn't be feasible?
 5 **A. Two reasons come to mind. The first is the**
 6 **technical feasibility, and the second is the**
 7 **economic feasibility. When you consider that we**
 8 **have a large urban area that has been built over**
 9 **the last couple hundred years and the**
 10 **infrastructure lies underneath that built**
 11 **environment, the ability to completely transform**
 12 **that infrastructure underground would be**
 13 **technically challenging. And --**
 14 **Q.** And you also mentioned the -- I'm sorry. I
 15 didn't mean to interrupt you.
 16 You also mentioned the economic costs
 17 involved. Do you have any sense for what that
 18 might be?
 19 **A. Absolutely. To re-pipe a utility's water system**
 20 **and wastewater treatment system would be**
 21 **extremely costly to take that kind of**
 22 **undertaking. And I'm not sure of the benefit for**
 23 **investing that type of dollar.**
 24 **Q.** Ms. Kirkpatrick, I want to turn to discussing the
 25 2010 Water Stewardship Act that was enacted in

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1 the State of Georgia that you were asked some
 2 questions on by cross-examination. And one of
 3 the documents you were shown described the 2010
 4 Water Stewardship Act as modest legislation. Do
 5 you agree with that?
 6 **A. I do not.**
 7 **Q.** Why not?
 8 **A. You know, it was -- it was really a fundamental**
 9 **change for the State of Georgia going forward,**
 10 **No. 1. No. 2, we had a number of organizations**
 11 **that also recognized that on a national level**
 12 **having the State of Georgia enact this type of**
 13 **conservation and efficiency legislation was a**
 14 **leader for the nation at the time.**
 15 **And you could start by looking at the --**
 16 **within the state, the Georgia Conservancy, which**
 17 **is a statewide environmental organization, lauded**
 18 **the passage of the Water Stewardship Act. You**
 19 **can also look at another organization that's been**
 20 **referenced here today, American Rivers. And they**
 21 **highlighted how excited they were about the**
 22 **passage and how it really served as a national**
 23 **example. And then the Alliance for Water**
 24 **Efficiency, which is a leading national**
 25 **organization focused on conservation and**

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1 **efficiency, also heralded the passage of the Act.**

2 **Q.** Ms. Kirkpatrick, will you tell us what some of

3 the key components were of the 2010 Water

4 Stewardship Act?

5 **A. Sure. The first was outdoor watering**

6 **restrictions, again, fixture retrofits; and**

7 **another piece would have been water loss audits.**

8 **Q.** I want to ask you about the outdoor watering ban.

9 Can you tell us what that was?

10 **A. Yes. For the first time it restricted outdoor**

11 **watering between 10 a.m. -- in other words, you**

12 **couldn't do it between 10 a.m. and 4 p.m.**

13 **Q.** And when did that apply? Every day?

14 **A. Every day, 365 days a year, every year,**

15 **regardless of whether or not it was wet or dry.**

16 **Q.** Okay. And you were shown some exceptions to the

17 outdoor watering ban. Do you remember that?

18 **A. I do.**

19 **Q.** And do you agree that the exceptions undermine

20 the benefits of the outdoor watering ban?

21 **A. I don't.**

22 **Q.** Okay. You also mentioned annual water loss

23 audits. Is that something that was part of the

24 Act?

25 **A. It was.**

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1 demonstrate progress?

2 **A. Very similar enforcement action or enforcement**

3 **capability from -- well, from Environmental**

4 **Protection Division. They can choose not to**

5 **issue, renew, or issue new permits for those**

6 **utilities.**

7 **Q.** Okay. Dr. Sunding, an expert for Florida in this

8 case, testified in his written testimony that

9 Georgia can undertake leak abatement programs on

10 a sustained year-by-year basis. What's your

11 reaction to that proposal from Dr. Sunding?

12 **A. It seems outdated.**

13 **Q.** Why is that?

14 **A. Because we're already doing that. The District**

15 **has had it in place for a number of years. The**

16 **State of Georgia has had it in place since 2010.**

17 **And with implementation of the 2015 rules, it's**

18 **already in place across the State of Georgia.**

19 **Q.** Ms. Kirkpatrick, I want to shift topics again

20 because at the beginning of your

21 cross-examination, you were asked about the water

22 contingency planning task force. Do you remember

23 that?

24 **A. I do.**

25 **Q.** Can you just briefly describe for us what was

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1 **Q.** Can you tell us what that was?

2 **A. Yes. So they required within the State of**

3 **Georgia, not just metro Atlanta, for systems**

4 **servicing public water supply to 3300 people or**

5 **more, they must adopt the water loss audit**

6 **process and begin to implement it.**

7 **Q.** And what percentage of the population, if you

8 know, in the ACF Basin in Georgia is served by

9 utilities that are subject to the water loss

10 audit requirements of the Water Stewardship Act?

11 **A. A significant portion, if not a vast majority.**

12 **Q.** Now, since the Water Stewardship Act was enacted,

13 I believe you mentioned there have been some

14 additional rules passed in connection -- that had

15 some connection to the Water Stewardship Act. Do

16 you remember that?

17 **A. I do.**

18 **Q.** Can you describe for us what those rules are and

19 what they require?

20 **A. So the Georgia Water Use and Efficiency Rules**

21 **require each of those utilities that we just**

22 **spoke about servicing 3300 people or more to**

23 **demonstrate progress toward their goals**

24 **illustrated from an audit.**

25 **Q.** And what happens if a utility fails to

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1 that task force? Why was it formed?

2 **A. So just at a very high level, when Magnuson ruled**

3 **in another case that Georgia would not be able to**

4 **access Lake Lanier for water supply, the State of**

5 **Georgia convened a task force to look at options**

6 **that could potentially be evaluated in the**

7 **absence of Lake Lanier being available for water**

8 **supply.**

9 **Q.** What kind of time frame did the task force

10 operate under?

11 **A. Less than 90 days.**

12 **Q.** Why so quick?

13 **A. The Judge had stayed the Order for three years,**

14 **and so it felt like we needed to move forward**

15 **pretty quickly to evaluate some options.**

16 **Q.** And did the task force make any findings about

17 the suitability of Lake Lanier as a water supply

18 source for the Atlanta area?

19 **A. Yes. They did.**

20 **Q.** What were those?

21 **A. After the task force concluded its work, its**

22 **primary finding was that Lake Lanier was the most**

23 **suitable water supply source for the region, both**

24 **from an economical and an environmental**

25 **perspective.**

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1 **Q.** On cross-examination you were asked about kind of
 2 the two buckets of recommendations that are
 3 included in the task force report, the no regrets
 4 options and the contingency measures. Do you
 5 recall that?
 6 **A. I do.**
 7 **Q.** And of the no regrets options, how many of the no
 8 regrets options have been implemented by the
 9 Metro Water District?
 10 **A. 100 percent.**
 11 **Q.** And, again, what's the population of the Metro
 12 Water District that's served by -- that relies on
 13 ACF waters for its water supply source?
 14 **A. 4.1 million people.**
 15 **Q.** Now, the contingency options, Ms. Kirkpatrick,
 16 did the task force recommend that Georgia
 17 implement the contingency measures?
 18 **A. No.**
 19 **Q.** Why not?
 20 **A. Because, again, the primary finding was that Lake**
 21 **Lanier was the best alternative for water supply.**
 22 **Q.** Did the task force identify any challenges or
 23 obstacles that might be imposed with implementing
 24 the contingency measures?
 25 **A. They did.**

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1 **Q.** What were those?
 2 **A. So, again, given that the time frame was short**
 3 **for the evaluation process of the task force,**
 4 **comprehensive feasibility from an engineering**
 5 **perspective was not done on any of the options.**
 6 **Second, legal considerations were not taken into**
 7 **account; third, societal; and fourth,**
 8 **environmental considerations were not fully**
 9 **vetted either. And all of those needed to take**
 10 **place before any single contingency option could**
 11 **be contemplated as an option going forward.**
 12 **Q.** Okay. Ms. Kirkpatrick, I just have one final set
 13 of questions for you. You know, as someone who
 14 has worked with the Metro Atlanta Chamber of
 15 Commerce, who has worked on the Metro Water
 16 District, who has worked on the task force, can
 17 you just tell us about the importance of a water
 18 supply source to the metro Atlanta region?
 19 **A. It's critical. I mean, we're the ninth largest**
 20 **MSA in the nation. We're home to a broad range**
 21 **of businesses, from small to Fortune 500. We**
 22 **have a healthy university community, over 70**
 23 **colleges and universities. We're home to the**
 24 **CDC. We are home to the world's largest airport.**
 25 **We're home to over 5 million people who rely on**

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1 **the waters of the ACF and the ACT Basin. And**
 2 **water is a fundamental driver of not only our**
 3 **economic success but also the quality of life of**
 4 **the citizens in metro Atlanta.**
 5 **Q.** And, Ms. Kirkpatrick, do you feel that the Metro
 6 Water District has taken steps to conserve the
 7 water resources that are in the region?
 8 **A. Absolutely.**
 9 **Q.** And just describe that again for us.
 10 **A. You know, it -- it shouldn't be lost on any of us**
 11 **that if you look back over 15 years, and you look**
 12 **at the significant progress that this planning**
 13 **entity has taken, and you look at the fact that**
 14 **we have reduced our per capita usage by 30**
 15 **percent while adding 1 million people or more to**
 16 **our region, that is exceptionally significant and**
 17 **shows that the planning agency is doing their**
 18 **job.**
 19 **Q.** Ms. Kirkpatrick, thank you very much.
 20 MR. ALLEN: Your Honor, I have no
 21 further questions.
 22 SPECIAL MASTER LANCASTER: Recross?
 23 RECCROSS-EXAMINATION
 24 BY MR. FAWAL:
 25 **Q.** Ms. Kirkpatrick, you testified about toilets and

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1 faucets and showerhead retrofits. Correct?
 2 **A. I did.**
 3 **Q.** Just to clarify for the Court, indoor water uses
 4 don't really affect consumptive use rates.
 5 Correct?
 6 **A. No. They can.**
 7 **Q.** Well, indoor water use is virtually
 8 nonconsumptive. Correct?
 9 **A. There is minimal consumption.**
 10 **Q.** You understand outdoor watering and leak
 11 abatement have a much bigger impact on
 12 consumptive use. Correct?
 13 **A. They can, yes.**
 14 **Q.** When you are using per capita usage in your
 15 testimony, that's not the same as consumptive
 16 use. Correct?
 17 **A. It is not.**
 18 **Q.** And you're referring to water withdrawals.
 19 Correct?
 20 **A. I'm not sure I understand your question.**
 21 **Q.** You're referring to the amount of water used by a
 22 person without respect to the return rates.
 23 Right?
 24 **A. When I talk about consumptive use?**
 25 **Q.** No, per capita use.

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1 **A. Oh, per capita use. So ask me your question**
 2 **again.**
 3 **Q.** You testified about per capita usage --
 4 **A. Yes.**
 5 **Q.** -- and its decrease. And I just want to clarify
 6 that's not the same thing as consumptive usage.
 7 Right?
 8 **A. Correct.**
 9 **Q.** You also mentioned or were asked some questions
 10 about Dr. Sunding. Were you here when
 11 Dr. Sunding testified?
 12 **A. I was not.**
 13 **Q.** Okay. Have you read his testimony?
 14 **A. I have not.**
 15 **Q.** Are you aware he testified to ways to offset net
 16 IBT's through conservation efforts?
 17 **A. I am not familiar with his testimony.**
 18 **Q.** You testified earlier that you think leak
 19 abatement is generally a good thing. Right?
 20 **A. Yes.**
 21 **Q.** Okay. In fact, you just testified that Georgia
 22 is doing it today. Right?
 23 **A. Correct.**
 24 **Q.** And so you would agree that would actually make
 25 it easier to implement leak abatement policies

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1 Dr. Sunding is providing. Right?
 2 **A. I'm not familiar with the policies that**
 3 **Dr. Sunding is providing.**
 4 **Q.** If he's suggesting continuing leak abatement,
 5 you would agree that's already in place.
 6 Right?
 7 **A. I think Georgia has a program that's already in**
 8 **place, yes.**
 9 **Q.** And you're not suggesting that leaks won't happen
 10 in the future. Right?
 11 **A. That's correct. And there is a program in place**
 12 **to adjust that.**
 13 **Q.** And, therefore, it will save water in the future
 14 as well. Right?
 15 **A. Yes.**
 16 MR. FAWAL: No further questions, your
 17 Honor.
 18 MR. ALLEN: Nothing further, your Honor.
 19 SPECIAL MASTER LANCASTER: Ms. Kirkpatrick,
 20 were you -- you were here when the last
 21 witness before you testified?
 22 THE WITNESS: For a portion.
 23 SPECIAL MASTER LANCASTER: Well, for the
 24 record, I am not a technician. Do you --
 25 have you ever heard of Battle Bend?

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1 THE WITNESS: I have not.
 2 SPECIAL MASTER LANCASTER: Nothing
 3 further.
 4 MR. ALLEN: Nothing further.
 5 MR. FAWAL: Nor for me, your Honor.
 6 MR. ALLEN: Your Honor, we have our next
 7 witness, Peter Mayer, prepared to testify.
 8 We're happy to go ahead and put him on the
 9 stand now. Or I think both sides are happy
 10 to either proceed or wait until the morning
 11 to start his testimony, however the Court
 12 would prefer.
 13 SPECIAL MASTER LANCASTER: Approximately
 14 how long do you anticipate this witness and
 15 the next witness will take?
 16 MS. WINE: Without -- we're just
 17 conferring because we don't know what each
 18 other has planned. But I anticipate that we
 19 can finish both easily tomorrow without there
 20 being any issues.
 21 SPECIAL MASTER LANCASTER: And tomorrow
 22 being from 9:00 to what?
 23 MS. WINE: I'm guessing we would be done
 24 by 3:00, if not earlier in the day.
 25 SPECIAL MASTER LANCASTER: We'll recess.

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1 (Time Noted: 3:40 p.m.)
 2 (Proceeding adjourned to Tuesday,
 3 November 22, 2016, at 9:00 a.m.)
 4 (End of Day)
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CERTIFICATE

I, Claudette G. Mason, a Notary Public
in and for the State of Maine, hereby certify
that the foregoing pages are a correct
transcript of my stenographic notes of the
Proceedings.

I further certify that I am a
disinterested person in the event or outcome
of the above-named cause of action.

IN WITNESS WHEREOF, I subscribe my hand
this 10th day of December, 2016.

/s/ Claudette G. Mason
Claudette G. Mason, RMR, CRR
Court Reporter

My Commission Expires
June 9, 2019.

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