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BEFORE THE  
ARIZONA NAVIGABLE STREAM ADJUDICATION COMMISSION

IN THE MATTER OF THE NAVIGABILITY )  
OF THE GILA RIVER FROM THE NEW ) NO. 03-007-NAV  
MEXICO BORDER TO THE CONFLUENCE )  
WITH THE COLORADO RIVER, GREENLEE, ) ADMINISTRATIVE  
GRAHAM, GILA, PINAL, MARICOPA AND ) HEARING  
YUMA COUNTIES, ARIZONA. )  
\_\_\_\_\_)

At: Phoenix, Arizona  
Date: June 20, 2014  
Filed: July 11, 2014

REPORTER'S TRANSCRIPT OF PROCEEDINGS  
VOLUME V

Pages 1026 through 1287, inclusive

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1 BE IT REMEMBERED that the above-entitled and  
2 numbered matter came on regularly to be heard before the  
3 Arizona Navigable Stream Adjudication Commission, State  
4 Senate Building, Hearing Room 1, 1700 West Washington  
5 Street, Phoenix, Arizona, commencing at 9:00 a.m. on the  
6 20th day of June, 2014.

7

8 BEFORE: WADE NOBLE, Chairman  
9 JIM HENNESSY, Vice Chairman  
10 JIM HORTON, Commissioner  
11 BILL ALLEN, Commissioner

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1 CHAIRMAN NOBLE: We are back on the record as  
2 they say in courtrooms but not in hearing rooms; and  
3 Mr. Gookin, I believe Commissioner Allen has a question  
4 or two for you.

5 Commissioner Allen.

6

7

ALLEN GOOKIN,

8 called as a witness on behalf of Gila River Indian  
9 Community, was examined and testified as follows:

10

11

EXAMINATION

12 BY COMMISSIONER ALLEN:

13 Q. Just very quickly, during the time frame  
14 between 1890 and 1910, roughly, when you indicated that  
15 the stream channel turned from a meandering channel to a  
16 braided channel, what impact did the arroyo cutting have  
17 on that circumstance?

18 A. It was really part of the same process. That  
19 was basically too much water flowing in the streams from  
20 the flood waters. That's what caused it to -- that's  
21 what gave it the energy to rework the streams was the  
22 floods.

23 Q. Okay. But would not the cutting of the  
24 arroyos be expressed in the main channels as well as the  
25 side channels of most of the streams? If it hadn't

1 happened in the main channel, then it wouldn't have  
2 happened in the side channels?

3 A. I think you're right. I hadn't thought about  
4 it, but I think you're right.

5 Q. So that would have had the effect of actually  
6 deepening the low flow channel possibly?

7 A. On the Gila?

8 Q. Yeah.

9 A. Well, it lowers the water level, and that  
10 allows the cutting to go back upstream. And so I think  
11 that it's not so much it would deepen the low flow  
12 channel, but the lowering of the hydraulic grade for the  
13 tributaries, the outlet is what would let it work back  
14 upstream.

15 Q. But it would have had to have had a lowering  
16 effect on the main channel as well, or it wouldn't have  
17 worked its way back upstream?

18 A. Well, by the main channel, I wouldn't say the  
19 little bitty, what I call the primary. I think the  
20 inset braided area, before you went out to the real  
21 floodplain, would be lower.

22 Q. Okay. Thank you.

23 CHAIRMAN NOBLE: Anyone else have any  
24 questions for Mr. Gookin?

25 Okay, Mr. Gookin, you can resume a seat; and

1 while Mr. Burtell and Mr. Hood move forward, we're going  
2 to talk about when we want to reschedule the remainder  
3 of this hearing on the Gila River.

4 VICE CHAIRMAN HENNESS: Don't everybody talk  
5 at once.

6 CHAIRMAN NOBLE: No, we have a proposal. We  
7 propose that the two days that we want to allocate for  
8 the remainder of this hearing be on Monday, August 18,  
9 and Tuesday, August 19, and that we notice the upper  
10 Salt hearing to begin on Wednesday, August 20, and  
11 continue until such time as we decide we're done, from  
12 day-to-day, from year to year, from millennia to  
13 millennia. Whatever it takes to get the Salt done, we  
14 will continue it. How does that fit with everyone's  
15 calendars?

16 We'll start here.

17 MS. HERNBRODE: Sorry, I couldn't see Mr. Helm  
18 behind the column. It's fine with our calendar because  
19 we had that blocked out already. I have some concern  
20 that this hearing is taking two days longer than we had  
21 all anticipated and that the upper Salt, although we all  
22 anticipate it to be significantly shorter, things seem  
23 to go horribly wrong during these proceedings that keep  
24 us from doing that. So I'm concerned about cutting it  
25 down from the four days to the three days that we're

1 perhaps just postponing our problem down the line. But  
2 I'm willing, I mean, if you just have one day then left  
3 off and it's easier to find a scheduling thing for one  
4 day, so that's fine.

5 I also have some concern about the overlapping  
6 briefs; but if you're willing to work with us on that,  
7 then --

8 CHAIRMAN NOBLE: Mr. Katz.

9 MR. KATZ: I think that the proposed time  
10 frame sounds good. The only question I have -- and I  
11 don't want to needlessly drag this out -- is whether or  
12 not two days is going to be adequate to cover the  
13 remaining experts that the respondents or opponents of  
14 navigability need to present, our cross-examination, and  
15 possibly an hour or two -- I wouldn't think more than  
16 that -- of rebuttal.

17 So I don't know whether we need to look at two  
18 or three days, and the only other potential conflict I  
19 have -- but I'll leave that to Joy and Laurie -- will  
20 probably be primary on the upper Salt. I have a plan to  
21 leave the last week of August when my wife has off to  
22 visit family back in Michigan, but I don't think we'll  
23 be running into that time frame.

24 CHAIRMAN NOBLE: Mr. Helm.

25 MR. HELM: The only question that I had was it

1 was two days for the presentation of the evidence for  
2 nonnavigability, and we're missing that day for  
3 rebuttal. The timing is fine for me. I mean, I was  
4 going to say any time in August. Maybe, I don't know,  
5 I'm not the expert on Open Meeting laws, but maybe we  
6 could just schedule the upper Salt to commence upon  
7 completion of the Gila, and whatever it takes, then we  
8 just, you know, put that box away and start the next  
9 box.

10 CHAIRMAN NOBLE: Thank you.

11 Mr. McGinnis.

12 MR. MCGINNIS: That works for -- I have the  
13 two experts, I think, still left before rebuttal, and  
14 that works for both of them. The one concern I have  
15 when we get to the upper Salt and the last part of that  
16 week is, Dr. Mussetter after that week is gone for a  
17 month or so. So -- but I think we can work that out by  
18 taking him out of order if we need to to make sure he  
19 gets done on the upper Salt part by the end of that  
20 week, and it should be fine.

21 CHAIRMAN NOBLE: Thank you.

22 Mr. Sparks? Mr. Hood?

23 MR. SPARKS: Mr. Chairman, it's fine with us  
24 because we blocked out that period for the upper Salt,  
25 so however the Commission thinks we should use it is the

1 way we'll use it.

2 MR. HOOD: Yeah, the proposal works great for  
3 Freeport, Mr. Chairman.

4 CHAIRMAN NOBLE: Let's take the somewhat  
5 lesser matters first.

6 With regard to any briefing schedules, we'll  
7 modify those so that there's plenty of time. One thing  
8 we will assure you is that you won't be asked to do any  
9 briefing without a transcript. So you'll have adequate  
10 time after the transcript is delivered in order to do  
11 your briefing. We'll send out a, call it in other  
12 circles a scheduling, a schedule for doing things. We  
13 won't call it a scheduling order. I'm not sure we issue  
14 orders, but anyway, we'll send out a schedule for when  
15 the briefing will take place.

16 We will look into the possibility of letting  
17 the Gila finish before we start the Salt. That could be  
18 a little bit difficulty -- a little bit difficult,  
19 especially if we have some witnesses who could be  
20 disappearing on us for a long period of time that are  
21 involved both in the Gila and the upper Salt.

22 Is that correct, Mr. McGinnis?

23 MR. MCGINNIS: Yes, sir.

24 CHAIRMAN NOBLE: Okay.

25 MR. MCGINNIS: As I said before, I don't have

1 any problem taking them out of order if we could have  
2 them be the first expert on our side. We can work that  
3 out.

4 MR. HELM: I don't have a problem if he wants  
5 to have him be the first witness period, just, you know.

6 MR. MCGINNIS: I would rather not do that.

7 MR. HELM: Just trying, just trying.

8 CHAIRMAN NOBLE: The issue of rebuttal, I'm  
9 not sure that we will include rebuttal in the remainder  
10 of the Gila hearing that we are scheduling, hopefully,  
11 for the first two days of the week, 18th and 19th  
12 August. We may look for another date to do rebuttal.  
13 Now, if that involves witnesses that are not available  
14 -- and I'm looking at Mr. McGinnis -- then we'll have  
15 some difficulty in scheduling that; and although I  
16 almost am trying to figure out how to do it, I wouldn't  
17 mind having the rebuttal on the Salt and the Gila  
18 together. I don't know how much difficulty that would  
19 be, but I suspect that most of the witnesses are going  
20 to be the same.

21 Mr. Katz.

22 MR. KATZ: It would seem to me that since we  
23 have the burden of proof, normally rebuttal would just  
24 be a brief opportunity to allow Mr. Fuller to respond to  
25 the opposing experts. I'm not going to direct this

1 Commission on how to run its business, but we have the  
2 burden of proof, and we would think that we would have  
3 maybe an hour to two for Mr. Fuller as our only witness  
4 on rebuttal.

5 CHAIRMAN NOBLE: Let's see where we get to,  
6 and if we can do it, let's do it.

7 The other thing is that, a scheduling issue.  
8 It has been brought to our attention rather directly  
9 that we need to schedule a hearing in Pinal County. So  
10 we're looking at --

11 MR. SPARKS: I'd like to point out one thing  
12 for the record though, that Florence is not the county  
13 seat of Graham County.

14 CHAIRMAN NOBLE: Okay. I was born in the  
15 county seat of Graham County, but never mind. I'll  
16 point that out, but it doesn't help the record either.

17 We would like to go to Florence at 10:00 a.m.  
18 on Friday, August the 29th. And if I hear 11:00 a.m.,  
19 we'll do that, too.

20 MR. HELM: The 29th?

21 CHAIRMAN NOBLE: On the 29th.

22 MS. HERNBRODE: 11:00 a.m.?

23 CHAIRMAN NOBLE: 11:00 a.m. it is.

24 MR. KATZ: Mr. Chairman, that's solely for the  
25 purpose of allowing any public comment, correct?

1 CHAIRMAN NOBLE: Correct.

2 MR. KATZ: We're not continuing any of our  
3 presentations.

4 CHAIRMAN NOBLE: Will that work for most  
5 everyone? Do not anticipate party witnesses at that  
6 hearing.

7 Mr. Helm.

8 MR. HELM: I was just going to say if worse  
9 comes to worse, we could do the rebuttal down there.

10 CHAIRMAN NOBLE: We could. We thought about  
11 that. And --

12 MR. KATZ: I would rather not. Sorry to  
13 interrupt you, but that's the one week that I'm hoping  
14 to get away the entire summer, so --

15 CHAIRMAN NOBLE: At this point we'll leave it  
16 at 11:00 a.m. and not expect to do any rebuttal work  
17 down there. Let's see what works out.

18 MR. KATZ: That's fine.

19 CHAIRMAN NOBLE: I don't think we'll schedule  
20 that heavy primarily in deference to Mr. Katz.

21 Any other?

22 MR. KATZ: Joy or Laurie can cover if it's  
23 just public comment.

24 CHAIRMAN NOBLE: Any other issues or matters  
25 that we ought to talk about before we turn the time over

1 to Mr. Hood and his witness?

2 Then Mr. Hood.

3 MR. HOOD: Thank you, Mr. Chairman.

4

5

RICH BURTELL,

6 called as a witness on behalf of Freeport Mineral  
7 Corporation, was examined and testified as follows:

8

9

DIRECT EXAMINATION

10 BY MR. HOOD:

11 Q. Good morning, Mr. Burtell.

12 A. Good morning, Mr. Hood.

13 Q. You've been here all week; is that right?

14 A. I have.

15 Q. Ready for the weekend?

16 A. I am looking forward to it.

17 Q. Mr. Burtell, the Commission at this point is  
18 quite well acquainted with you by now, but would you  
19 just please introduce yourself for the record?

20 A. Yes. My name is Rich Burtell.

21 Q. And we've now twice gone through, not in great  
22 detail, but an overview on your background, your  
23 education and the other contents of your curriculum  
24 vitae, correct, on the San Pedro and then on the Santa  
25 Cruz?

1 A. That's correct.

2 Q. Okay. We're going to rest on those prior  
3 discussions, sort of incorporate them here and try and  
4 save everybody some time, okay?

5 A. That would be great.

6 MR. HOOD: And George, is it all right if I  
7 hand you hard copies of Mr. Burtell's report in case the  
8 Commissioners would like to follow along? Thank you,  
9 sir.

10 MR. MEHNERT: It's already submitted.

11 MR. HOOD: It's already in the record. It's  
12 just for reference, if that's convenient.

13 And Mr. Burtell's curriculum vitae is  
14 attached. It's Attachment A, I believe, to that report.  
15 Yes, and by reference to Freeport's index of exhibits,  
16 Mr. Burtell's vitae is Freeport 1, and his declaration,  
17 which also includes his curriculum vitae, is Freeport 2.  
18 BY MR. HOOD:

19 Q. Mr. Burtell, what did Freeport Minerals  
20 Corporation ask you to do in this case?

21 A. I was asked to evaluate the navigability  
22 potential, if you will, for what I refer to as the upper  
23 Gila, and in light of Mr. Fuller's testimony as well as  
24 Mr. Gookin's, I divided the upper Gila into what I refer  
25 to as Segments A, B and C, and they are roughly

1 equivalent -- well, maybe not so roughly equivalent --  
2 to Mr. Fuller's Segments 1, 2, and 3, and I believe  
3 Mr. Gookin's 1, 2, and 3.

4 Q. By not so roughly equivalent, do you mean they  
5 are equivalent, more or less?

6 A. More or less. What I haven't done is looked  
7 carefully at Mr. Fuller's maps to see exactly where his  
8 points are, but they are probably within a half mile or  
9 so. They end -- the start and end points.

10 Q. For purposes of the level of detail that we'll  
11 be talking about today, and again your report is in the  
12 record. We will continue to rely upon your declaration  
13 which is Freeport 2. But for purposes of the level of  
14 detail we're going to get into here, for all intents and  
15 purposes, your A, B, and C are the same as Mr. Fuller's  
16 1, 2, and 3?

17 A. That's correct.

18 Q. Okay.

19 A. So for comparison as we go through this,  
20 that's how people should view it, true.

21 Q. Okay. And just in general strokes then, we're  
22 talking about the Duncan Valley, the Gila Box, and the  
23 Safford Valley?

24 A. That's correct.

25 Q. Okay. And I want to very, very briefly,

1 Mr. Burtell, because we're going to go through it in  
2 more detail, but I just want you to very briefly  
3 summarize what opinions you reached with respect to your  
4 Segments A, B, and C which we'll also refer to  
5 collectively as the upper Gila River.

6 A. Sure. In light of the tasks that the  
7 Commission put before us in this hearing, I did look at  
8 PPL Montana and again decided to segment that upper  
9 portion of the Gila River into those three segments.

10 Upon my review of existing data and new data  
11 that I analyzed, I came to the conclusion that all three  
12 segments, in my opinion, were neither actually navigated  
13 or susceptible to navigation in its ordinary and natural  
14 condition along the Gila River on or before statehood.

15 Q. Okay. I want to talk a little bit about,  
16 again, in broad strokes, your general methodologies, and  
17 maybe we can do that as we walk through the table of  
18 contents to your declaration.

19 A. Yeah. Hopefully the Commission has seen  
20 enough PowerPoints, slides this week. I am happy to say  
21 perhaps that there are no PowerPoint slides in my  
22 presentation, so folks will be forced to look at my  
23 report. And to kind of follow along, as Mr. Hood said,  
24 probably the easiest way is just to go to the table of  
25 contents to get a sense of the organization of my

1 report.

2 One thing I did, and some of the other experts  
3 have done as well, is looked at different lines of  
4 evidence. I feel I did a pretty good job of looking in  
5 several independent lines of evidence of navigability.  
6 And those are outlined here.

7 In my table of contents, as you can see, I  
8 looked at the river segmentation.

9 Channel geomorphology I discussed in some  
10 detail related to each one of the three segments.

11 And then the next sections of the report dive  
12 into these independent lines of evidence that I looked  
13 at to determine whether or not the upper Gila River was  
14 navigable or not. And that included looking at historic  
15 accounts, historic photographs, transportation needs at  
16 that time. And then stream flow reconstruction. We've  
17 heard a lot of testimony regarding that this weekend --  
18 or this week -- and I certainly did that. That's the  
19 next two sections of my report goes into that.

20 And then finally, I looked at boating  
21 accounts, both prehistoric, historic, and more recent.

22 So I think it's important in my opinion for  
23 the Commission to not latch on to any one independent  
24 line of evidence, but to take several lines of evidence  
25 in their entirety; and based on looking at all of those

1 lines of evidence, come to a conclusion one way or the  
2 other, and hopefully I've done that.

3 Q. Okay. And you mentioned already you've been  
4 here the whole week. You've heard everybody testify; is  
5 that right?

6 A. I have.

7 Q. Okay. And having heard from other experts and  
8 other testimony throughout the week, have any of your  
9 opinions changed?

10 A. No.

11 Q. Let's talk a little bit, we've gone through  
12 your table of contents. Can you also just very briefly  
13 describe how your tables, figures, attachments are  
14 organized, just in broad strokes, so we have a sense of  
15 organization?

16 A. Sure. The lion's share of the tables have to  
17 deal with the reconstruction of flow that I performed.  
18 But the first table -- and I'm certainly not going to  
19 bore the Commission or the audience -- is a -- I know  
20 it's difficult. I have bad eyes, too. But it's a table  
21 that tries to capture historic accounts that are  
22 relevant to the upper Gila, and accounts of folks that  
23 went down the river, in my opinion, on or before a time  
24 when there were major disturbances or diversions along  
25 the river. That's the first table.

1 Many of the tables that follow that are all  
2 related to my reconstruction, either directly or  
3 indirectly.

4 And then towards the bottom of my -- that long  
5 list of tables, Table 14 is kind of a key table which  
6 I'm sure we'll be talking a lot about, at least during  
7 my testimony. That's where I -- well, a couple tables  
8 are key, I should say. Table 10 where I take all those  
9 reconstructions and summarize them. That's Table 10.

10 Table 14 is I compare them to some other  
11 estimates.

12 And then the last table, which I think has  
13 been discussed a little bit, is my summary of all the  
14 historic boating accounts that I identified during my  
15 research in the upper.

16 Figure 2, I think, is key, and we'll probably  
17 want to look at that as I go through my direct testimony  
18 here. That's where I show my segments as Mr. Fuller  
19 did. I also show the locations of the various gage  
20 sites that I did my flow reconstructions at.

21 Q. And just to interrupt briefly, Mr. Burtell.

22 A. Sure.

23 Q. In terms of orienting ourselves with respect  
24 to the various segments you're talking about, is  
25 Figure 2 probably going to be what we refer to most

1 frequently?

2 A. I would think so, particularly when it comes  
3 to the flow reconstructions, sure.

4 Q. Please proceed.

5 A. I have a few other figures related to  
6 geomorphology. I have a photograph.

7 Figures 5, 6 -- I feel historic accounts are  
8 of great value -- and these are some maps that show  
9 where some of these historic travelers went down the  
10 Gila. I have some photographs of that.

11 I have a map of military bases in Arizona that  
12 I think will be of interest to the Commission to take a  
13 look at.

14 A figure showing a railroad route that went up  
15 to Clifton.

16 And then last, but not least, some stream flow  
17 reconstructions that were done, not by me, but by using  
18 tree rings that take the record back literally to about  
19 1300, believe it or not.

20 Q. Okay. Thank you for that overview.

21 So why don't we jump in. We sort of covered  
22 what would be your Sections 1 and 2.

23 A. Mr. Hood, one last thing for the Commission's  
24 benefit that I forgot to mention in terms of my report  
25 is the attachments. We did mention my resume is in A.

1 There has been a fair amount of discussion today about,  
2 or this week, I should say, regarding these historic  
3 accounts.

4           What I did for the Commission's benefit, at  
5 least in my attachments B, C, and D, is actually  
6 provide, so you don't have to believe me. You don't  
7 have to believe any other expert. You can read for  
8 yourself in the words of the person who went down there  
9 the accounts, some of the historic accounts. So in  
10 attachments B, C, and D, I provided those sections that  
11 cover at least the portion of the Gila River that I  
12 looked at for your benefit to, again, read it in their  
13 words. Don't take my word for it.

14           And then last but not least -- I'm sure there  
15 will be some discussion on this -- are my series of  
16 hydrologic rating curves which I used as part of my flow  
17 reconstruction.

18           Q.       Great. Thank you.

19           I think the first section of your declaration  
20 that is where you start to get into your actual analysis  
21 instead of overview is Section 3, channel geomorphology;  
22 is that a good place to start?

23           A.       Yeah, it sure is. And there has been a lot of  
24 talk, I think, already this week regarding channel  
25 geomorphology. And I don't have a lot to add to that

1 discussion beyond what's in my report. But I'll try to  
2 highlight a few areas that might add something new that  
3 the Commission hasn't already heard.

4 Certainly, I don't think there's any  
5 disagreement that I've heard among the experts that have  
6 gone so far related to the widening and braiding of the  
7 channel. I know there's a lot of discussion about low  
8 flow channels and the floodplain. But I don't think  
9 there's much disagreement among the experts that in the  
10 early 1900s due to some large flooding events that the  
11 Safford Valley, and probably by implication the Duncan  
12 Valley, widened substantially due to these extreme flood  
13 events, and that changed the channel geomorphology.

14 There hasn't been much discussion about what  
15 that did to the Gila Box. So I do have a brief  
16 discussion in my declaration related to how that  
17 flooding may have changed the Gila Box.

18 In my conclusion, at least based on the data  
19 that I looked at, is it's probably unlikely that the  
20 Gila Box channel got much wider.

21 Q. A more constrained reach, generally speaking?

22 A. Yeah, I think all the experts would agree,  
23 even though I think someone pointed out, it doesn't look  
24 like the Grand Canyon in there, it's a bit wider, but it  
25 still is a bedrock lined channel, certainly a much

1 different character. It's not an alluvial valley  
2 setting. It's more a confined bedrock setting. There  
3 wasn't any evidence that I could find, even when I  
4 looked at stream flow gauging where they actually went  
5 out and did field measurements, that the channel was  
6 braided in that area.

7           On the other hand, in the Safford Valley --  
8 and I didn't put this in my report but I do have  
9 photographs that show it -- the braiding of the Safford  
10 Valley was dramatic. And there's a figure in my report  
11 that the other experts, I think, presented that shows --  
12 it's a rather famous study that was done by -- it's now  
13 a famous study done by a fellow from the USGS named  
14 Burkham. And he actually tracked the width of the  
15 channel from the mid 1800s on, and it shows how much it  
16 widened.

17           But there is a figure that I think that might  
18 be valuable for the Commission to look at, and I  
19 apologize. When I saw how those were handed out to you,  
20 I don't see that there's any tabs, but in my figures if  
21 you could -- and they're at the, after my text. If you  
22 could refer to Figure 4, I would appreciate it.

23           Q.       Thanks for throwing me under the bus with  
24 respect to the tabs, Burtell.

25           A.       I begged for tabs, but tabs did not arrive,

1 so --

2 CHAIRMAN NOBLE: It's just hard to get good  
3 lawyers these days.

4 MR. HOOD: Boy.

5 THE WITNESS: Well, so I apologize in advance,  
6 those of you that are rifling through the reports. But  
7 maybe this will be a more hands-on experience for us all  
8 then.

9 If you take a look at Figure 4, I direct your  
10 attention towards the two photographs on the bottom. I  
11 had the benefit of meeting with folks from the  
12 U.S. Geological Survey down in Tucson, and they have a  
13 remarkable digital photo library of all of these gage  
14 sites and when they were originally installed and the  
15 photographs that come with them.

16 And I would direct your attention to -- and  
17 this figure upstream from Calva has been reproduced by  
18 other authors at other times, but it came from the USGS.

19 What I'd like to draw your attention to is --

20 BY MR. HOOD:

21 Q. Which figure are we at, Mr. Burtell?

22 A. I'm sorry, I'm on Figure 4, the photograph on  
23 the bottom left which says upstream from Calva.

24 And I've heard testimony this week regarding  
25 the fact that when you have a braided channel, there is

1 one low flow channel. And I don't disagree that there  
2 will be one flow channel. But I also feel, at least  
3 this photographic evidence suggests, that it's also not  
4 that unusual to have multiple channels that do have  
5 water in them.

6 This photograph was taken, as you can see, in  
7 February, which is before the typical high water  
8 snowmelt period. And not only do you have multiple  
9 channels there, and as Mr. Gookin said, they cross each  
10 other, but you've got vegetation on the bars.

11 Now, this was in the 1930s, so this has been  
12 some 20 years more, now 30 years since the large flood  
13 events occurred that caused the original braiding. So  
14 the stream was still recovering, as I've heard people  
15 say. And it's clear that it was still recovering. It's  
16 not that broad now. But it just goes to show you, at  
17 least at this time, that there wasn't just one single  
18 low flow channel. There seem to be photographically --  
19 I'm not surmising or modeling. This is a photograph.

20 I apologize with the figure next to it on the  
21 bottom, which is from the Coolidge Dam site. The folks  
22 from the GS climbed up the hill, and if you look at that  
23 photograph, you'll actually see again braiding. This  
24 was also in February. And I apologize for -- 66 is  
25 obviously a typo. I'm assuming that was either the 6th

1 or the 26th. I'll figure out what that date was. But  
2 it's February 1928. The dam, as I believe, got  
3 completed later that year.

4 And once again, this concept that Mr. Fuller  
5 has presented to the Commission -- that I'm not  
6 disagreeing that there are places where a braided  
7 channel might just have one low flow channel, but  
8 there's also certainly places, as these photographs  
9 suggest, where the braided channel is not just one  
10 single channel but multiple channels.

11 And if you look at that photograph, which  
12 again is a little washed out, you'll see that there are  
13 several islands in the stream, if you will. And you've  
14 got water, not just one single channel, but you've got  
15 water going pretty much every which direction.

16 I would challenge someone, perhaps not in a  
17 kayak, but someone in a commercial vehicle used at that  
18 time to try to navigate either one of those reaches.

19 Q. What's your reaction to the notion that's been  
20 presented this week that when you have a finite amount  
21 of flow, that it's divided among multiple actual flowing  
22 channels in a braided context? How does that divide the  
23 depth among those channels?

24 A. Yeah. You know, I found something online that  
25 I'd like to quickly share with the group. And it was

1 related to the Pecos River in New Mexico. In light of  
2 the testimony I heard this week, I went online one of  
3 the nights this week and found a group that kayaks and  
4 does recreational boating down the Pecos River in the  
5 Albuquerque area. And they made the comment that where  
6 the river becomes braided, it becomes more challenging  
7 for the kayakers because -- their words, not mine -- the  
8 channel splits into multiple channels and the flow gets  
9 less.

10 My experience has been -- I see Mr. Fuller's  
11 figures showing the just one isolated channel. But when  
12 you're going to have enough flow where it's in more than  
13 one channel, that flow is going to get split into more  
14 than one channel; and I think more times than not it's  
15 going to be shallower overall than if it was all in one,  
16 let's say, meandering channel.

17 Getting back to my geomorphology section,  
18 again, not wanting to reiterate things that have already  
19 been said by others. One other thing I found that I  
20 don't think anyone else introduced into evidence or in  
21 their report was related to when the USGS -- as part of  
22 my flow reconstruction, I spent a lot of time, as  
23 Mr. Gookin and probably Peter Mock did, looking at when  
24 the USGS actually went out in the field and measured  
25 actual channel flow. You don't have to apply Manning's

1 equation. You're actually measuring the depth with the  
2 velocity of the channel, what's actually out there.  
3 There's not modeling involved.

4           And one of the things that I noticed when I  
5 looked at these forms -- it's called a 9207 form -- is  
6 where the GS summarizes all of their field measurements  
7 that they take at a rating gage -- or at a stream gage  
8 to help develop rating curves, and I am very familiar.  
9 I think Mr. Hjalmarson has questioned whether I do  
10 understand this, but I'm very familiar with, having done  
11 it, adjusted rating curves for stream flow gages, and I  
12 know rating curves change. That's why they go out and  
13 do these field measurements.

14           But what I noticed when I looked through those  
15 records is particularly the gages that were in the  
16 Duncan Valley and in the Safford Valley, how many times,  
17 at least in the '20s and '30s when the river was still  
18 "recovering" from the former big flood events, is how  
19 many times the channel, when they went out to measure  
20 it, to actually see water in the channel, was in more  
21 than one channel, multiple channels.

22           And so it was not -- we don't have to surmise  
23 whether or not it was braided. They actually were there  
24 and trying to take field measurements, and there was  
25 more than one channel.

1           And as I indicate in my bullet 23, there  
2 hasn't been as much research in the Duncan Valley about  
3 the degree of braiding; but when I looked at the field  
4 measurements that were in the period when I did my flow  
5 reconstruction, you can see in my text over 20 percent  
6 of the times that they went out there at two gage  
7 sites -- they have the Duncan gage site and the  
8 so-called York gage site, and both of those are in the  
9 Duncan Valley. They found over 20 percent of the time  
10 that it was multiple channels.

11           I didn't put it in the report since the record  
12 seemed more obvious. But the percentage was more on the  
13 order of 50 or 60 percent of the time when they went out  
14 at the Calva gage that it was split into multiple  
15 channels.

16           So again, this isn't a guess about whether or  
17 not there was just one low flow channel. There was  
18 actually multiple channels that were witnessed by people  
19 that were in the field. So I thought I would add that  
20 to the discussion since I hadn't heard that before.

21           MR. KATZ: What was the last gage you made  
22 reference to?

23           THE WITNESS: The York.

24           MR. KATZ: Thank you.

25           THE WITNESS: York like New York.

1 BY MR. HOOD:

2 Q. In terms of we've had some discussion about  
3 this over the week and indeed going back to 2005, and  
4 Dr. Huckleberry said the floods have a much greater  
5 impact on the geomorphology and the geometry of the  
6 channel than do human diversions. And what's your  
7 reaction to that comment?

8 A. Yeah, and certainly that discussion -- and I  
9 don't want to offend Mr. Helm in terms of bringing other  
10 rivers into this discussion.

11 MR. HELM: But you will.

12 THE WITNESS: But that was discussed in detail  
13 in the San Pedro case. It didn't seem to be, as I  
14 recall since I was the only one who testified, at least  
15 this round. I don't think it was discussed much in the  
16 Santa Cruz. But there has been, if we could stack up  
17 all the reports of people that have evaluated why there  
18 was the, or the effects of that flooding that occurred  
19 in the early 1900s and the reason for that flooding, it  
20 could probably fill part of the room.

21 I think I would concur with the  
22 geomorphologist that the State hired that the cause of  
23 that was primarily natural. It was climatic events. As  
24 I recall in his report, he admitted that there were  
25 cultural things that had happened at the time that may

1 or may not have had an influence on it, but he simply  
2 couldn't make a strong connection. And I think his  
3 words -- I'm paraphrasing -- were, you know, my premise  
4 is that climatic variability is what drives that.

5 And just to add on to that is a very  
6 prevocative study that Mr. Gookin had in his report of  
7 going way back in time and looking at channel cross  
8 sections and going back hundreds, if not thousands, of  
9 years, and looking at how the channel has changed long  
10 before Anglos came to the area.

11 And there is a long geologic history of  
12 channel braiding followed by meandering followed by  
13 braiding. So I think, my opinion is, based on looking  
14 at that and all the evidence presented, is that both  
15 stream conditions are natural, both a straight braided  
16 channel as well as -- I mean, a straight meandering  
17 channel as well as a braided. It so happens on or  
18 before statehood most of the upper Gila, in my opinion,  
19 was in a braided form with the exception of Gila Box.

20 BY MR. HOOD:

21 Q. And that certainly is relevant, but you also  
22 looked at an awful lot of evidence from the late 1800s,  
23 mid to late 1800s when the channel was in a more  
24 meandering single channel condition; is that right?

25 A. Indeed. In fact, my historic accounts, and I

1 believe I state in my report, my historic accounts  
2 are -- I think, I'm sure I'll be corrected if I'm  
3 wrong -- I think are all on or before 1880 before there  
4 was any substantial braiding.

5 I believe Burkham -- and it's in one of my  
6 figures -- shows that there were some flood events, but  
7 I think it was after 1880 that temporarily broadened the  
8 channel but then it recovered more quickly.

9 So my historic accounts are when it was a  
10 single meandering channel. And so I think the benefit  
11 of my report, perhaps, is that I have evidence both when  
12 it was a single meandering channel as well as a broader  
13 channel, regardless of the discussion of low flow  
14 channels, when I don't have evidence that there was any  
15 navigation.

16 Q. Your opinions then -- do your opinions rely in  
17 any way on a finding by the Commission that we've got a  
18 braided channel condition in the upper Gila on or before  
19 statehood as the governing channel for purposes of  
20 navigability?

21 A. No. No.

22 Q. And that's because you looked at evidence  
23 including time periods where it wasn't a braided  
24 channel, predominantly?

25 A. Again, I'm not trying to hang my hat on either

1 braided or meandering channel. Fortunately, I think, at  
2 least for the upper Gila is we have evidence of stream  
3 flow conditions and use of the watercourse during both  
4 periods. So why put ourselves into a box.

5 But I would like to reiterate that I got the  
6 sense in the testimony so far this week that there has  
7 been some uncertainty about whether or not braiding or  
8 meandering is the natural condition of the Gila. And  
9 trained as a geologist, I would say looking at long time  
10 periods, that both conditions are natural. It just  
11 happens to be what time you're out there.

12 Q. And on the date of statehood in 1912, the  
13 braiding condition was predominant?

14 A. It was predominant in the Safford segment, and  
15 based on information I have, I would believe also in the  
16 Duncan.

17 Q. Okay.

18 A. Gila or Gila Box, probably didn't affect it  
19 very much.

20 Q. And do you have any opinions as to the  
21 geomorphology downstream on the river?

22 A. I've read the various reports. I think there  
23 is some, some pretty strong evidence that even before  
24 the large flooding event -- but I guess I want to make a  
25 point to the Commission and to the audience is, although

1 I looked at all of the reports, historic -- well, not  
2 historically, but this case is becoming historic. The  
3 number of reports that have been written since the '90s  
4 all the way up to present, there seems to be some very  
5 interesting evidence that even the lower, the middle to  
6 lower had braided sections long before the major  
7 flooding that occurred in the early 1900s.

8 But there's also evidence, and everyone knows,  
9 and I'm the first to admit, I am a student of historic  
10 accounts. There's also accounts -- and I've looked at  
11 what other people have said that, boy, it looks like it  
12 was also meandering.

13 So I think it's complicated, which often as  
14 scientists we like to simplify and put things in a box.  
15 But I think it's complicated, not only spatially, but  
16 temporally. And to hang your hat on one or the other,  
17 you know -- but a guiding principle here is on or before  
18 statehood, and so certainly the years immediately  
19 preceding statehood are relevant and need to be  
20 considered.

21 Q. And the Daniel Ball Test is on statehood, on  
22 the date of statehood; is that right?

23 A. It seems like we can't escape that statehood  
24 and what was happening on or before that. I think what  
25 complicates our matter and what makes it so challenging

1 is that obviously the susceptibility and natural and  
2 ordinary force us to not just look at statehood, but  
3 also, as necessary, look back in time when perhaps there  
4 weren't any effects by man on the river.

5 So we all know, if this was simpler, we  
6 wouldn't all be arguing about the same data sets.

7 Q. Yeah, we would.

8 A. Well --

9 Q. Yeah, we would.

10 Anything else on geomorphology, Mr. Burtell?

11 A. I think that's the highlights.

12 In the Gila Box, as you can see, I put --  
13 going back to those field measurements when the USGS was  
14 out there at the time during my reconstruction period,  
15 you can see there were very few times that the Clifton  
16 Gage between 1928 and '33, over 190 times when they went  
17 out there, they only found it split into two or more  
18 channels five times. So I suspect after a large flood  
19 event, maybe it got temporarily split, but then it  
20 quickly went back to a single channel.

21 So again, Gila Box, I don't think the concern  
22 or argument about split channels comes much into play  
23 there.

24 Q. Okay. Should we move into your observed  
25 predevelopment stream flow conditions, which is Section

1 4 of your declaration.

2 A. Yeah.

3 Q. That begins on Page 5 of your declaration.

4 A. This is historic accounts, and for any of you  
5 with bad eyes, I have to quickly tell a little anecdote.  
6 I'm actually a trifocal guy. I didn't even know such a  
7 thing existed, but my eyes are so bad that I wear  
8 contacts, and I wear one pair of reading glasses, and  
9 then when I use a computer, I wear another pair of  
10 reading glasses. So I think Ms. Herr-Cardillo during  
11 either the San Pedro or the Santa Cruz, admittedly and  
12 understandably complained about the small font of my  
13 Table 1, and I'll just apologize to everyone. But I've  
14 got bad eyes, too. And I have to smile because I see  
15 Mr. Sparks with a magnifying glass, and I've gotten to a  
16 point now -- maybe I'm whatever, maybe a quadfocal guy,  
17 because I even use a magnifying glass.

18 But I'm not going to walk through Table 1,  
19 Commissioners. There is a lot there. I will maybe draw  
20 your attention to some of the highlights.

21 This is pre-1880. Before a time when there  
22 was substantial diversions in the segments of the Gila  
23 River that I looked at, my segments A, B, and C,  
24 Mr. Fuller's and Mr. Gookin's Segments 1, 2 and 3.

25 I'll say again, don't necessarily believe what

1 I or any of the experts say. I think it's always good  
2 if you have the time or -- I apologize again for the  
3 small font -- but put the account right on the table and  
4 let you guys read it in the words of the person who was  
5 there. So there isn't any confusion about whether it  
6 was a successful or not successful trip or whatever. A  
7 lot of time can be spent arguing. So I have the direct  
8 descriptions here of what the person said. So please  
9 read them.

10 As a student of history -- I'm not a  
11 historian -- so when I get crossed and you guys want to  
12 ask me if I'm a historian, no, I'm not a historian. But  
13 as a hydrologist and as a water rights specialist,  
14 history is such a part of my profession that I can't  
15 help but become, I think, more than an amateur  
16 historian.

17 I've learned, as I think all of us  
18 hydrologists have when you look at historic accounts,  
19 that you shouldn't take any one in isolation. You  
20 should look at all of them, and draw your opinions based  
21 on the totality of the evidence.

22 You know, again, I had to smile when I heard  
23 all the testimony over the last week about whether a  
24 trip was successful or not. In some means it's in the  
25 eye or mind of the person reading it about whether it

1 was successful.

2 So please, if I can ask, please read through  
3 the descriptions. Ignore my comments, if you want, but  
4 just read what they put in their words.

5 When I read those, I did come to the  
6 conclusion that the upper Gila River was shallow. What  
7 I meant by shallow, typically less than a couple of  
8 feet. Certainly -- and I'm not hiding the accounts --  
9 they're in my table. There were times during spring  
10 runoff, which typically occurs in March and April when  
11 it gets higher. There's also storm events in the  
12 summertime when it really gets high.

13 And I, myself, have been in those events on  
14 the Santa Cruz, and it's a pretty scary experience. It  
15 can get high and it can get high quick. Sometimes these  
16 guys witness that, if they were there at the right time.

17 But in its totality, I would say that these  
18 accounts paint a picture to me of a stream that is  
19 nothing like the Colorado River where when those folks  
20 tried to cross it, they're building rafts and having  
21 Indians help them get across. We've had wagons going  
22 down. We've got horses going down. We have settlers  
23 coming into the area. And they're typically able to  
24 cross the river in a pretty routine fashion.

25 So that's, I think, the thing I would want you

1 to take away from that. If you have the time, please  
2 read the accounts in their own words.

3 Q. Is there a historical photograph you want to  
4 touch upon?

5 A. There sure is. And I'm sure I'm going to get  
6 asked about it. But there was, I think, a photograph  
7 that Mr. Fuller had in his presentation that also showed  
8 a wagon crossing. I don't know if it had the date.  
9 Maybe it did. 1885. I think it was 1885. And the  
10 water was higher. And obviously, you guys will all  
11 think, well, Burtell picked the photo where the water is  
12 really shallow. I think the reason it's valuable to  
13 look at that photo is the contrast --

14 Q. Can you identify which one it is for the  
15 record?

16 A. It's Figure 7. And if you go to Figure --  
17 again, I apologize for having to page through, but it's  
18 a bit washed out. I got this photograph from the  
19 Arizona Historic Society down in Tucson. And this is in  
20 the Calva area, and in the background, I believe that's  
21 Mount Turnbull or Mount Graham, depending on exactly how  
22 this picture was, the angle. And you can see oxen  
23 dragging these wagons across the river there.

24 I draw the contrast between this picture and  
25 what people had to do to cross the Colorado River. It's

1 just a whole different world. The Colorado River  
2 crossing, it was a real challenge. And in case of  
3 Pattie, he got all of his horses stolen when they  
4 reached the confluence, and that's when he then had to  
5 build all of the dugout canoes to go down the Colorado  
6 River.

7 Such challenges were not a problem on the  
8 upper Gila. In fact, there was only one account that I  
9 believe the State Land Department found of a ferry being  
10 used in the upper Gila by the military during high  
11 water, a flood event. This is, I think, more typical of  
12 what folks would have encountered. And this is 1880.  
13 This is pretty early in the game.

14 So this to me is another line of evidence  
15 where the water in the upper Gila is shallow, and it's  
16 nothing like the Colorado River.

17 Q. The next section of your declaration,  
18 Mr. Burtell, is Section 5. It begins on Page 8 of your  
19 declaration, and it's titled Early Transportation Needs.  
20 And for me, as I was reading through your declaration,  
21 this is where the rubber really starts to hit the road.

22 A. I think so. I, as we all are, I am a student  
23 of the Utah decision where I think the drum got beat the  
24 loudest about the fact that just because you don't have  
25 evidence of historic navigation doesn't mean that it's

1 not susceptible to. Although that susceptibility  
2 language was even in Daniel Ball. So I guess it  
3 shouldn't be a mystery to any of us that you didn't have  
4 to necessarily be navigating to have navigability -- or  
5 to have a finding of navigability.

6 In our case, in the upper Gila, at least, we  
7 have not just two, but even a third that I should have  
8 put in the report -- and I'll talk about it in a  
9 minute -- of needs, obvious needs for people to  
10 transport, use the river. And this notion -- and maybe  
11 I'll get into this a bit more -- that Mr. Fuller has,  
12 which I disagree with that, hey, a wagon is quicker.  
13 Just use a wagon road.

14 The accounts that I've read of use of wagons  
15 on those roads, these roads got washed out. I'll go  
16 into this in some more detail. But some of these wagon  
17 roads were not just a few miles longer than if you could  
18 take the river, but sometimes two and three and four  
19 times longer of a course that they would have to take  
20 from point A to point B in a wagon than if they were  
21 able to just float the river.

22 So this concept of, hey, just use the road,  
23 that's easier. Mr. Fuller and I disagree on that. I  
24 think part of the reason the Colorado River was used so  
25 extensively, even though there were roads up along the

1 Colorado River, is that if you've got a river, it's a  
2 lot easier than going over an old wagon road after it  
3 had just rained where it's really muddy or it just got  
4 washed out. It's not a trivial matter to take a wagon  
5 on these roads.

6 Getting back to the transportation needs --  
7 and everyone who's known and worked with me knows I go  
8 off on tangents. So hopefully, Mr. Hood, you'll bring  
9 me back once in a while if I travel off.

10 Transportation needs in the upper Gila. We  
11 have them. We have them at a time when, when Fort  
12 Goodwin, which was, as I recall, 1864. There's no  
13 evidence that I have -- unless Mr. Sparks can provide me  
14 some acreage of how much acres the Apaches were  
15 irrigating back then. I think I put in my table less  
16 than a hundred acres, and that might even be high prior  
17 to 1870.

18 This is a military base that's up there at a  
19 time when there weren't any Anglo settlers, and we all  
20 know why it was there along with Fort Bowie. It was  
21 there to deal with the Apache unrest. Not the Apache  
22 threat, Mr. Sparks, the Apache unrest, if that helps  
23 any.

24 Q. Anglo unrest, perhaps?

25 A. Perhaps the Anglo unrest.

1 But there was, as we all know, it was a  
2 difficult time for everyone back then. But that  
3 military base, and for those that think that this wasn't  
4 a real live issue about getting supplies there, I have a  
5 couple of quotes. And I'll read you the quote 42, if I  
6 could, to the Commission. And this was written by  
7 General Mason in 1866. And he was talking about trying  
8 to get supplies to Fort Goodwin. And if you don't mind,  
9 I'll read it. I think it's nice to get on the record.

10 The vessel brought the supplies for Fort  
11 Goodwin -- that's my paraphrasing -- to Fort Yuma. Of  
12 course, these are coming from San Francisco, and were  
13 compelled to haul them from there to their destination.  
14 Much difficulty and delay was experienced on account of  
15 the very limited amount of transportation in the  
16 territory. Already we have near 900 Indians on the  
17 reservation and they are reported as coming in daily.

18 There were a lot of people there. This isn't  
19 just -- it is a dusty outpost, but it's not just two  
20 people. We've got 900 Indians and a military base that  
21 needs to be supplied. How do you get stuff in there?  
22 It's not a trivial matter. And I won't read quote 43;  
23 but to the degree that commerce -- which I feel it  
24 strongly does -- has a bearing on this proceedings. 43  
25 is where we're actually putting money into the picture.

1 And I understand, because I'm going to be asked, doesn't  
2 have to be a profitable venture. But let me put a  
3 different spin on commercial.

4 If it can save you money, they're going to do  
5 it, too. And if you take a look at 43, it just talked  
6 about the exorbitant expense that it cost to ship  
7 supplies from San Francisco all the way up to Camp  
8 Goodwin -- Fort Goodwin, at a time in the 1860s when the  
9 valley simply was not occupied. There just wasn't  
10 anything there.

11 Q. So to be clear, Mr. Burtell, the supplies are  
12 coming down from San Francisco, they're making their way  
13 to Yuma by boat?

14 A. By boat, going up to Yuma by steamboat up to  
15 Fort Yuma, or they would go further up, let's say to  
16 Ehrenberg, and then they would drop the supplies off  
17 also on the river, and then the stagecoaches, the wagons  
18 would start hauling that stuff inland on these various  
19 roads.

20 Mr. Fuller gives one the impression that if  
21 that's the case, maybe why would you even go all the way  
22 around, you know, on water. Why not just take it up the  
23 road. It seemed like that was -- which seemed to be  
24 against everything I've heard about the settlement of  
25 the West and the use of waterways is that if you've got

1 a waterway, you would use it. The testimony I seemed to  
2 hear earlier this week is not necessarily. If you've  
3 got a road, you use that, because it's quicker. That  
4 doesn't seem consistent with my understanding of how the  
5 West was settled, but maybe it's just a disagreement we  
6 have.

7 Before we get to the mining district in  
8 Clifton and Morenci, what I failed to put in this report  
9 that I'd like to mention to the Commission is Post  
10 Offices. There were -- and I have this data. It comes  
11 actually from Mr. Fuller's 2003 report, and he has a  
12 chronology table. And if you guys need me to pull it  
13 out, I can get a direct page number. But he lists a  
14 chronology of the upper Gila, and in that chronology he  
15 has -- it's a wonderful thing. He's got various dates  
16 of establishments of various entities up there, and he's  
17 got the date the Post Offices were established.

18 And I believe at Safford and Solomonville he  
19 has the fact that Post Offices were established, and  
20 also in Clifton. The Post Office in Clifton was  
21 established in 1875, and you had a pretty good  
22 population center there. And then you also have  
23 population centers in the valley. And this is in the  
24 mid 1870s. So we're at a time when agriculture is  
25 beginning, but it's just beginning. And you got the

1 Post Offices there, and you got to get the mail there.  
2 And I think all would agree that use of a river to  
3 transport mail would be considered a commercial  
4 enterprise. No evidence that I have that they used it  
5 in that manner.

6 Moving on to the mining, the Clifton-Morenci  
7 mining district was established also pretty early in the  
8 game in the 1870s. What's interesting about the  
9 Clifton-Morenci mining district is the closest major  
10 town to that area was Silver City in New Mexico.

11 And what's interesting to me is students of  
12 the development of agriculture in this area all know  
13 that Safford Valley was a few years ahead of Duncan  
14 Valley and the Virden Valley. And I have a table that  
15 actually tracks, I think about in five-year time steps,  
16 how agriculture first developed in those two areas. The  
17 Duncan Valley was a little bit later in the game.

18 And what struck me is when the Clifton-Morenci  
19 operations were first beginning in 1875, and quickly  
20 grew from there, there was a road from Clifton-Morenci  
21 to Silver City. There was a road. I couldn't find  
22 anything, even back then, that they utilized the river  
23 in any capacity.

24 I think the Commission needs to think about  
25 why that is. Now, Mr. Fuller and I and others, we can

1 debate about why they didn't use the river. It  
2 certainly makes me scratch my head a bit. Again,  
3 knowing that a wagon road isn't necessarily the simplest  
4 thing to do. And everywhere else in the West where  
5 there was a good river to navigate, they used it. And  
6 for some reason there's the upper Gila between Silver  
7 City, Clifton-Morenci, 1875. If there's even 100 or 200  
8 acres of agriculture and they're ignoring the river, I  
9 don't understand why that would be.

10           These were folks back then that were  
11 entrepreneurs, that were trying to do anything that they  
12 could as cheaply as they could and as efficiently as  
13 they could. But the river seemed to be ignored.

14           So I don't necessarily buy Mr. Fuller's  
15 arguments, but maybe there are some other arguments that  
16 I haven't heard as to why that would be.

17           I go in to some detail here about one  
18 interesting part of that development of that mine above  
19 getting supplies between Silver City and Clifton. And  
20 that is the development of the little town of  
21 Solomonville. And I didn't enter this, and I apologize  
22 to the Commission. I know you guys hate stuff coming in  
23 late. I know the attorneys hate stuff coming in late.  
24 But there is a book that I actually stumbled onto  
25 recently, and Mr. Hood is going to pass these out. And

1 before anyone jumps up and screams, all this does, I  
2 think, is further supports the quote, which is 48, that  
3 was written by the guy who ran the Longfellow mine.  
4 This book was actually written by the granddaughter of  
5 Solomon.

6 CHAIRMAN NOBLE: We're listening.

7 THE WITNESS: Okay.

8 The Solomons of which Solomonville was named,  
9 those that live in the Safford Valley, that's obviously  
10 a legendary family that was influential in the  
11 settlement of that valley.

12 And this book was written by his  
13 granddaughter, and there's the picture of the two of  
14 them on the back of the book. But what this goes into,  
15 and this is simply supplemental to what 48 is. This is  
16 in the words of the guy that operated the mine, and what  
17 this book is is in the words of the granddaughter of the  
18 fellow who actually settled Solomonville. It talks  
19 about when he came into the area, he first went to  
20 Clifton, found out that there was an opportunity to get  
21 some business by hauling charcoal up to the furnaces in  
22 Clifton, and he took that opportunity. He was an  
23 entrepreneur, if there ever was one, if you know the  
24 history of Solomon.

25 He proceeded down the Safford Valley,

1 established his town in, at that time, Pueblo Diego  
2 which was a small Mexican community. And then he  
3 proceeded to develop a business where he was hauling  
4 charcoal from that area up to Clifton.

5           What's interesting in this book that wasn't in  
6 this newspaper article, he built the first road. So his  
7 granddaughter talks about in the book that the first  
8 road between the Safford Valley and the Clifton mines  
9 was actually, if you believe his granddaughter, was  
10 built by him. And then later improved upon by the  
11 mining site to help facilitate the transport of supplies  
12 back and forth.

13           There was a need -- I guess I'm rambling.  
14 There was a commercial need to get supplies. A little  
15 caveat also about this is that as the Safford Valley  
16 first started to develop, there was gardens. A lot of  
17 mining communities, there was a real relationship  
18 between agriculture and mining. And not necessarily  
19 huge agriculture, but gardens, because the miners would  
20 need produce. And so gardens would establish in the  
21 Safford area, and they were hauling that produce up to  
22 the Clifton-Morenci mine.

23           Again, at a very early period, and there  
24 simply is no evidence -- there was nothing in this book  
25 that I found that talks about a boat. So Solomon and

1 his granddaughter -- and you would think writing a book  
2 about her grandfather, that if there were some  
3 provocative adventure stories or not so adventurous  
4 stories about using boats that you might hear that. I  
5 didn't see any of that.

6 MR. HOOD: While you're picking your next  
7 point, Mr. Burtell, I just want to state for the record  
8 for the Commission's benefit, I believe the page  
9 citation for the chronology in Mr. Fuller's 2003  
10 Safford-Gila report, upper Gila report from 2003 is  
11 Roman IV-5 and 6.

12 THE WITNESS: A couple other points I'd like  
13 to make about supplying the mines at this time. Getting  
14 back to the point that the agricultural development in  
15 the Duncan Valley lagged behind that in the Safford is,  
16 again, the road that went from the Clifton mines up to  
17 Silver City followed the upper Gila through the  
18 Duncan-Virden Valley, and then it branched off and went  
19 off into New Mexico.

20 And in 1880 -- it's in my footnote on  
21 Page 10 -- the railroad finally came to New Mexico, and  
22 it came to Lordsburg in the fall of 1880. And I can  
23 assure you, based on the accounts of these miners and  
24 the huge expense they had in hauling supplies to their  
25 mine and ore out of their mines, that they were tracking

1 that railroad development, I'm sure, very closely.

2 So even in the fall of 1880, they knew the  
3 railroad was coming, but there was no effort by anyone  
4 to use boats. In fact, the mine ended up building a  
5 railroad from the Clifton-Morenci area to meet Lordsburg  
6 to facilitate the transport of goods and supplies. But  
7 when that decision was made to build the railroad in, I  
8 believe it was 1882 by Arizona Copper Company, it was  
9 again a time when there was very modest, I would say  
10 less than a few hundred acres of agriculture occurring  
11 in the upper Gila watershed above where that mine was.  
12 So it seemed like a very modest amount of agriculture  
13 that in my opinion wouldn't have had any effect on the  
14 navigability of the river, and yet it wasn't used.

15 There is one last caveat that I'll throw in,  
16 and we'll talk more about Mr. Lingenfelter's declaration  
17 later. But unbeknownst to me, since Mr. Lingenfelter  
18 just recently wrote quite a treatise on historic mining  
19 in the West, is I was focused more on the mining  
20 operations in the Clifton area. The Morenci area, which  
21 is right next door, also had its own mining history.  
22 And as Mr. Lingenfelter -- or Dr. Lingenfelter reminded  
23 me, the folks that ran the Detroit Copper Company, which  
24 owned and operated the first mines in Morenci, they were  
25 steamboat captains. And so I don't say that as anything

1 more to indicate that these are men that owned that mine  
2 that certainly were aware of the value and the benefit  
3 of using water for commercial purposes and  
4 transportation. And they certainly didn't use, as far  
5 as everything I've read, they did not use the upper Gila  
6 River in any way, even though as steamboat captain  
7 owners -- they owned a steamboat company in Michigan --  
8 they certainly would understand the value of it.

9 BY MR. HOOD:

10 Q. Mr. Burtell, your segue to Dr. Lingenfelter  
11 marries up with my outline. Is now a good time to talk  
12 more in depth about Dr. Lingenfelter?

13 A. Sure. Sure.

14 MR. HOOD: For the record, the affidavit of  
15 Richard E. Lingenfelter is Freeport 3-3. It's already  
16 in the record.

17 THE WITNESS: As I was --

18 MR. HELM: Excuse me here.

19 CHAIRMAN NOBLE: Yes, Mr. Helm.

20 MR. HELM: May I just make one interjection?  
21 Last evening, I was informed by counsel that  
22 Mr. Lingenfelter or Dr. Lingenfelter is not going to  
23 testify in this matter. Is that true?

24 MR. HOOD: That is true, at least not this  
25 week.

1 MR. HELM: Well, you told me ever.

2 MR. HOOD: Well, we have not discussed with  
3 Dr. Lingenfelter whether he's available at a later time  
4 now that we're continuing. I don't anticipate him  
5 coming out to Arizona. That's my current anticipation.

6 MR. HELM: Thank you. I just wanted that on  
7 the record.

8 THE WITNESS: As I was preparing this report  
9 and doing my research, I came across, as many students  
10 of boating history in Arizona have, Dr. Lingenfelter's  
11 treatise on steamboat development along both the  
12 Colorado River and its tributaries. So I reached out to  
13 him and wanting to better understand those boats that  
14 were customarily being used at the time of statehood in  
15 Arizona.

16 So I found him. Strangely enough, he's in  
17 California -- or maybe not so strangely enough. He's a  
18 fascinating man as his background, if anyone has looked  
19 at his declaration, would indicate. He's an  
20 astrophysicist of some reclamation. But on the side, he's  
21 also, I think, one would almost argue a world-renowned  
22 historian. He has written many books of great acclaim  
23 regarding the West, mining, as well as his book on  
24 boating on the Colorado River.

25 So I reached out to him. And again, I'll just

1 reiterate my purpose for that was Daniel Ball, and  
2 Daniel Ball saying customary modes of travel at the time  
3 of statehood.

4 So I wanted to better understand, more than  
5 just my 10,000 foot level, what boats were actually  
6 customarily being used at statehood in that capacity.

7 Mr. Chairman, if I could approach your  
8 Commission, I have a copy of Mr. Lingenfelter's book --  
9 Dr. Lingenfelter's book, and if the Commission would  
10 find any value in it, the pictures are great. I  
11 think, I'll just put it at that, showing these boats at  
12 the time. So if it would be of any value to the  
13 Commission, I could show that to you.

14 CHAIRMAN NOBLE: Please hand it to Mr. Horton.

15 MS. HERNBRODE: Can we get at least a look at  
16 it and copies of the photos that you have tabbed there  
17 at some point?

18 MR. HOOD: I'm sure I can get photocopies of  
19 the pictures.

20 THE WITNESS: And please, Counsel, that's more  
21 than a fair question to ask. What are the stickies that  
22 I put on there? There's nothing written on the  
23 stickies, and please verify me, if you'd like. The  
24 stickies that I put on there was for my own benefit. He  
25 has a series of maps that shows where there were

1 landings and ports along the Colorado River and its  
2 tributaries, and also pictures of -- photographs of  
3 boats that he took. I think when you look at them, it's  
4 one thing to talk about it; it's something else to see  
5 it, particularly when you look at the dates and it says  
6 1860, 1865.

7           And it's remarkable to me how quickly and how  
8 aggressively boating in Arizona developed. I know there  
9 was extensive discussion this week about Mr. Fuller's 27  
10 years, and I'm not going to suggest whether that should  
11 or shouldn't be taken out of context, and I won't do  
12 that here.

13           But I will say based on when the first boats  
14 wandered up the Colorado River in 1851 through 1860 or  
15 '65, that in a matter of five or ten years there was a  
16 vibrant and very competitive boating business on the  
17 Colorado River. It happened and it happened quick. And  
18 if there's some maybe concern among the Commission about  
19 how much time it takes to get up to speed on boating,  
20 I'll just let the book and the photographs speak for  
21 themselves. It was aggressive. It was quick. These  
22 people didn't wait around to figure out 27 years or ten  
23 years or five years to build a boat. They moved quick.  
24 It evolved very quickly.

25           And so I took that away from -- I had the

1 pleasure of talking to Dr. Lingenfelter and reached out  
2 to him and asked him if he'd be interested in providing  
3 his own thoughts to the benefit of the Commission. And  
4 so his declaration, I think, speaks for itself.

5 But again, I will simply testify to some  
6 things that I learned from reading it. One thing I  
7 think there seems to have been some disagreement that  
8 I've heard this week about Gila City/Dome. And I had to  
9 look at a map to verify, and then I have a book of  
10 Arizona place names to verify yes, Dome and Gila City  
11 are the same place.

12 It was a mining community where there was a  
13 gold rush, faster sand. And when I looked at a map,  
14 and, boy, the Colorado River -- or Gila River, as you  
15 folks know who live down there, it goes across a mile or  
16 two on a map and it's probably meandered three. It's  
17 really curvy, at least back on the old topos I've looked  
18 at. It's about 20 miles as I count, and I've heard  
19 other people say from the mouth of the Gila River up to  
20 Dome or Gila City.

21 And Dr. Lingenfelter in his declaration talks  
22 about he researched that. He didn't just look at the  
23 Colorado River. He looked at the tributaries, and he  
24 talks about the Colorado River -- or the Gila River, and  
25 when I both spoke with -- when I spoke with him about

1 that and mentioned to him about this idea about  
2 steamboats going up to Dome/Gila City, what he said to  
3 me was that all of his research did not support that,  
4 that there was an attempt when the gold rush hit,  
5 everyone got really excited.

6 A group of investors actually sent a boat down  
7 from San Francisco to the area to develop a commercial  
8 transport up to Dome. But unfortunately, the boat, I  
9 believe it burned or sank. And so that venture never  
10 ran its course, if you will.

11 So subsequently to that, Mr. Lingenfelter --  
12 Dr. Lingenfelter said that in his research, the only  
13 thing he was aware of is that the steamboats would go up  
14 about five miles up the mouth. And at least based on my  
15 reading of the previous Commission's report, and I think  
16 Stantec or maybe somebody else did a separate study of  
17 the backwater effects of the Colorado River; that when I  
18 read the Commission's previous findings, there was a  
19 section that talked about two miles upstream from the  
20 confluence was determined, at least in the Commission's  
21 mind, to be backwater from the river.

22 Dr. Lingenfelter said that there might be  
23 another couple of miles that recreationally, almost  
24 recreationally, but for picnics people would hire a  
25 steamboat to take them up a few miles past that up to

1 about five miles up the lower Gila. But this idea of  
2 going all the way up to Dome, I simply haven't seen  
3 before.

4 Q. Let me point you, I have here the slide from  
5 Mr. Fuller's PowerPoint on the Gila, the navigation of  
6 the Gila PowerPoint, and the page number here is  
7 probably not consistent with the one he ended up using  
8 at the hearing. I printed this off of my full-page  
9 version of the PowerPoint. Page 98, that probably is  
10 not consistent.

11 Anyway historical boating accounts,  
12 steamboats. It says, explored by steamboats 1860s after  
13 gold discovered around Gila City. Segment 8, and it  
14 says ran up to Dome is another bullet. And Mr. Burtell,  
15 were you here when I had a discussion with Mr. Fuller  
16 about the sources for that information?

17 A. I was.

18 Q. And he said, well, we've got three news  
19 articles here as sources. Have you had a chance to take  
20 a look at those three sources, which are the Arizona  
21 Sentinel from 1-25-1879; Arizona Sentinel, 6-12-1901;  
22 and Tombstone Epitaph, 5-27-1894?

23 A. I was. And I looked at them, and again, I'm  
24 the first to admit -- I'm sure I'm going to hear lot of  
25 it in cross-examination about something that I missed.

1 And I'm the first to admit when I miss something. But I  
2 couldn't find, at least in the three bullets that  
3 Mr. Fuller used to substantiate that slide regarding  
4 going up to Dome, where in these news articles it said  
5 that they went up to Dome. I guess the one that was  
6 maybe closest, and I'll read it. It was, I think  
7 Exhibit 21, where it says --

8 Q. Just to clear up the record on that,  
9 Mr. Burtell. This is Tab 21 of the Arizona State Land  
10 Department's exhibits which are in evidence. The tabs  
11 are 15, 16, and 21 respectively for those three news  
12 articles.

13 A. In Tab 21 it says, and I quote, steamboat  
14 excursions up the Gila River from Yuma are the rage just  
15 now. Even back then they had rages, I guess. The Gila  
16 is navigable a long distance at this season of the year.

17 So I read that, and I said, well, okay, as I  
18 think we can all agree, the rage and a long distance  
19 doesn't help us tell exactly where. What I noticed when  
20 I looked at Dr. Lingenfelter's report and all the  
21 research that he did is there were actually newspaper  
22 ads talking about using the Colorado River to transport  
23 materials and supplies. I didn't see, nor did he find  
24 anything, when he told me that there was any regular  
25 transportation up to Dome. And again, all he could

1 account or remember in his research was some picnic  
2 ventures up maybe as far as four to five miles up the  
3 mouth. But not to Dome, which is 20 miles. So I know,  
4 guys, maybe I'm splitting hairs, but four or five miles  
5 versus 20 miles, I don't think is a trivial distinction.  
6 So I guess I'll just leave it at that.

7 Q. Again, there may be some information out there  
8 about Dome, but you just haven't seen it?

9 A. And I'm sure I'll see a lot of things on  
10 cross-examination that I haven't seen before, so --

11 Q. Let's talk a little more generally about, or I  
12 guess more specifically, when you were talking with  
13 Dr. Lingenfelter about the navigability or lack thereof  
14 of the Gila River, what was his reaction?

15 A. He was quite surprised. And again, being a --  
16 and he also was a professor of history at UCLA among his  
17 astrophysicist work. He certainly indicated to me that  
18 he was surprised by the process that we're going  
19 through.

20 I guess based on his research of the  
21 tributaries of the Colorado River, it hadn't even  
22 crossed his mind, based on his research, that we would  
23 be having such a discussion. But that's fair. You  
24 know, he, perhaps, doesn't know all the nuances, but  
25 he's looking at this from a practical commercial boating

1 perspective, which is what his book talked about. And  
2 he simply couldn't find the evidence.

3           He brought something to my attention that I've  
4 been to the mine, but I never thought about it the way  
5 that he did, and that is the Ajo mine; and for those of  
6 you familiar with where Ajo is, it's in the southwestern  
7 part of the state. And he, having not only done a lot  
8 of research on boats but also on mines, he brought to my  
9 attention -- and it's in his declaration, and I'll let  
10 you read his words, not mine, or my interpretation of  
11 them -- that when they were early developing the Ajo  
12 mine, the expense of getting supplies in and out were  
13 exorbitant; and that the Gila River would have provided  
14 a very useful highway for commerce, if you will, for him  
15 to get his materials and his supplies out and off on the  
16 boat to San Francisco.

17           But they couldn't do it. In fact, what they  
18 had to do is they had to haul their ore out from the  
19 mine, down to Yuma, and then get it on the boat to go to  
20 San Francisco. And when you look at a map -- and maybe  
21 this gets back to Mr. Fuller's arguments about, well,  
22 just use a wagon road, it's quicker and faster; that  
23 seemed inconsistent with the practical realities of the  
24 time where, again, if there was a watercourse -- and I  
25 think Mr. Fuller and I disagree on this point very

1 strongly -- if there was a watercourse, my knowledge of  
2 history in the West and Lingenfelter's opinion would  
3 suggest, gosh, they're going to use it. The thought  
4 that you wouldn't use it because it's faster to use a  
5 wagon might sound like a good excuse, but it just  
6 doesn't seem to jive with the reality of the times of  
7 what they were actually doing back then.

8           But probably the thing that struck me most  
9 about Dr. Lingenfelter's book, my conversations with  
10 him -- you guys didn't know what those conversations  
11 were, so I'll let his declaration speak for itself -- is  
12 how entrepreneurial these people were at that time. And  
13 I've become much more of a student of the West than I  
14 ever was before I got involved in these ANSAC  
15 proceedings. These were difficult times but these were  
16 not naive times or unsophisticated times. These were  
17 times -- and one of the, either the County or the State  
18 Land Department entered into evidence an interesting  
19 document related to the political history of Arizona.  
20 And I read it with great interest, and it just showed me  
21 once again how sophisticated it was back then. And for  
22 those of us that think that, well, I don't know how to  
23 build a boat so I'm just going to sit on the shore or  
24 I'm not going to think about it. I just -- it just  
25 doesn't seem consistent with the level of

1 sophistication, the level of investment. The desire to  
2 develop Arizona was so palpably strong at this time that  
3 they were dying to get the railroad in, simply because  
4 they wanted to be able to move things around in a  
5 commercial, economic manner and get Arizona settled.

6 If you had a river, you would use it, and  
7 Mr. Fuller and I might disagree with that, but I would  
8 ask Mr. Fuller to maybe look at the Colorado River that  
9 was used a ton. And they only stopped using it when the  
10 railroad first came in and then later -- even after the  
11 railroad came in, they continued, as Mr. --  
12 Dr. Lingenfelter's book goes on into detail. They  
13 continued to use the river. It wasn't until they built  
14 the dams that they stopped using the river.

15 So, boy, if there was a watercourse to use,  
16 they would use it. And the history just seems very  
17 strong in that regard.

18 Q. And you already touched on this, that the  
19 owners of at least a couple of these mines were  
20 steamboat captains, yet they did not use the river?

21 A. The owner of the Detroit Copper Company, which  
22 owned the original Morenci mine workings, my declaration  
23 focused more on the Longfellow mine, which was in the  
24 Clifton area.

25 The Morenci mine workings were developed

1 contemporaneously, and the owners of the Detroit Copper  
2 Company -- ironically, I think Michigan is where the  
3 Daniel Ball case started, if there's any relevance  
4 involved there. And Daniel Ball is a steamboat, which I  
5 also find kind of interesting. But needless to say, I  
6 think these were businessmen that knew the importance of  
7 boats, and it just seems to me, if anyone would value  
8 the use of a watercourse, maybe between Clifton-Morenci  
9 and Silver City -- which was I think the biggest city  
10 nearby -- if anyone would have thought about it, I think  
11 it would have been those guys.

12 Q. Anything else to add on Dr. Lingenfelter  
13 before we move on to the next?

14 CHAIRMAN NOBLE: Before we take a break?

15 MR. HOOD: I thought that might prompt you,  
16 Mr. Chairman.

17 CHAIRMAN NOBLE: We're not taking a break  
18 until Mr. Burtell says he's done.

19 BY MR. HOOD:

20 Q. Let's close the loop on Lingenfelter and then  
21 we can take a break.

22 A. Okay. I think --

23 Q. I mean, in summary, he goes into great detail  
24 about the needs that were present and the lack of  
25 navigation certainly impacting his inclinations as to

1 whether this was a navigable stream.

2 A. Yeah, I think, I'll just reiterate, the  
3 presence of military bases that he was more than aware  
4 of and mining sites at a time, particularly in the upper  
5 Gila, prior to 1880, it really surprised him based on  
6 his knowledge of boats that were customarily being used  
7 at and before Arizona statehood for commercial purposes.  
8 He was very surprised -- I'll let his declaration speak  
9 for itself -- that the Gila would be a river that we'd  
10 be spending much time on; I'll just leave it at that.

11 MR. HOOD: Break time?

12 CHAIRMAN NOBLE: Yes, let's take 15.

13 (Recessed from 10:23 a.m. to 10:39 a.m.)

14 CHAIRMAN NOBLE: Mr. Burtell, Mr. Hood, please  
15 proceed.

16 MR. HOOD: Thank you, Mr. Chairman.

17 BY MR. HOOD:

18 Q. Mr. Burtell, when we left off, we were talking  
19 about Dr. Lingenfelter, his book, his affidavit  
20 submitted in this matter, which is Freeport 3, according  
21 to our index. I think where we are in your  
22 declaration -- correct me if I'm wrong -- is subpart C,  
23 Government Assessments on Page 10 of your declaration?

24 A. Thanks for reminding me. I kind of thought we  
25 had gotten through this. But I won't spend too much

1 more time on this. And again, I'm known to ramble, so I  
2 apologize to everyone in advance.

3 I did, among my other lines of research -- and  
4 some of the other experts have brought this to the  
5 Commission's attention -- came across some attempts by  
6 the federal government as they were surveying and  
7 evaluating the resources of the western United States.  
8 I came across some documents that were related to the  
9 Gila River and its potential or not for navigability.  
10 And I've listed those in bullets -- or my Paragraphs 57  
11 through, I'm sorry, 54 through 57. I'm not going to --  
12 54 and 55, I think both Mr. Fuller and Mr. Gookin have  
13 talked about John Bartlett, which was a surveyor that  
14 made some comments related to his opinion of the  
15 navigability of the Gila River. And I would like to  
16 read, although I think it's already in the record, his  
17 words. Again, I'll let you interpret what they mean.  
18 He wrote this saying, it is doubtful whether it -- that  
19 is the Gila River -- can ever be navigated except as its  
20 floods --

21 Q. At its floods.

22 A. Or at its floods -- excuse me -- and these are  
23 by no means regular. At such time flat-bottom boats  
24 might pass to the mouth of the Salinas-Salt River near  
25 the Pima Villages. And actually, I should have

1 remembered, this was in Mr. Fuller's 2003 report at the  
2 page cited.

3 I think this 55 we've all heard about, too,  
4 but I'll just reiterate that the legislature of the  
5 Arizona territory obviously was anxious, as I read, as I  
6 studied up on this river, how anxious they were to get  
7 the railroad here. They were also anxious to the degree  
8 they could to make the Colorado River more navigable.  
9 And this quote, I'm not going to read it, and I think  
10 many of us have seen it before. This was in a memorial  
11 by the legislature reaching out to Congress for money to  
12 help facilitate the navigability of the Colorado River.  
13 My obvious point here we all know would be, well, they  
14 didn't do that for the Gila River, let alone the upper  
15 Gila River.

16 Paragraph 56 -- and I've had the luxury of  
17 coming into this game a little bit later than a lot of  
18 these experts, so I know I'm a newbie here. But I am  
19 familiar with -- and I've used it before, but realized  
20 in this proceeding even more so -- the value of General  
21 Land Office maps. And believe me, folks, if you're  
22 going to cross-examine me on it, I fully understand that  
23 the purpose of why they were out there was not to map  
24 rivers. However, to the benefit of Dr. Littlefield who  
25 unfortunately isn't here, he was able to a lot more

1 quickly than me put those survey manuals in a format  
2 where you can look at them and get a sense.

3           The meandering of rivers, I'm not going to go  
4 into that. I know Dr. Littlefield will at length. His  
5 report didn't go all the way up to the upper Gila in  
6 terms, as I understand -- and, Mr. McGinnis, if I'm  
7 wrong -- I'm correct, I don't think even his latest  
8 version went to the upper Gila in terms of his analysis.

9           I did, in light of the meandering factor, I  
10 figured, well, let's take a look at the General Land  
11 Office maps in my study area, and the key, in my  
12 opinion, obviously is looking at the dates, making sure  
13 that when they're out there surveying, it wasn't at a  
14 time when there had been a lot of diversions. And both  
15 in the Duncan Valley -- which I'll again reiterate was a  
16 bit later in the development of irrigation -- and in the  
17 Safford Valley, which was earlier, but the dates are  
18 earlier, you typically survey -- my experience with  
19 looking at General Land Office maps is the maps would  
20 typically be surveyed at a time when the area was  
21 starting to get developed. There was a need to break it  
22 into townships, ranges and sections for settlement  
23 purposes, and the Homestead Act. And you could see  
24 Safford Valley, those dates are earlier typically than  
25 the Duncan Valley.

1           And I'm also fully aware of the fact that the  
2 most accurate part of the survey is along the survey  
3 lines. What's inside the section lines really wasn't  
4 their job, although they would, they would look inside  
5 those section lines as necessary; and among other  
6 things, based on their instructions and their manuals,  
7 they would look at river courses. And they would  
8 meander based on the survey manuals that Dr. Littlefield  
9 brought to, I think, everyone's attention in great  
10 detail. They would meander both banks of stream courses  
11 that -- and I fully understand, everyone. It's the  
12 opinion of the surveyor. It's when the surveyor was out  
13 there. I've looked at the survey manuals. There's no  
14 hard and fast rule of what constitutes a navigable river  
15 in the minds of a surveyor.

16           In almost all of my lines of evidence,  
17 Commissioners, and all the discussion us experts argue  
18 about, there's always gray areas.

19           So all I can say with any confidence is that  
20 these General Land Office maps at this time, which are  
21 early by these surveyors, these surveyors did meander  
22 both banks. So in their mind, based on what I fully  
23 admit is not perhaps as clear guidance in those manuals  
24 as they should have about what constitutes a navigable  
25 river or not, they did not feel that the Gila River in

1 this area was navigable.

2 Q. And that's what we do know; the surveyor  
3 didn't think it was navigable?

4 A. Right. And to me this is just another line of  
5 evidence. And I'm sure, and hopefully I'll be there to  
6 hear some provocative cross-examination of  
7 Dr. Littlefield on this topic, and I'm going to be  
8 anxious to hear it. But I throw this out there as just  
9 another line of evidence on this topic.

10 All right. And that concludes my looking at  
11 transportation needs. Either, again, military bases,  
12 mines, population centers with these Post Offices, and  
13 then the government attempt to look at it as well.

14 Q. Stream flow reconstruction is Section 6 of  
15 your declaration, and it begins on Page 12; is that  
16 right?

17 A. So now I take off my  
18 hydrologist-that-dabbles-in-history hat to my  
19 hydrologist-who-is-supposed-to-be-a-hydrologist hat.  
20 And this is where I'm getting down to doing the stream  
21 flow reconstructions.

22 Just in case I'm going to get asked, I  
23 actually did pony up on what the continuity equation is  
24 and the Manning's equation. And I think I can reiterate  
25 them. But feel free to ask me. I know what all those

1 equations are. I even remembered what Bernoulli was.  
2 But I was a little rusty on that. I don't use that  
3 quite as much on surface water.

4           So I'm aware of the equations, but I say that  
5 not in jest, but I'm trained as a scientist. And we  
6 love to take data and put it into a mathematical, try to  
7 fit a mathematical equation to data is what we like to  
8 do as scientists. It helps us to predict or make sense  
9 of this chaotic world in which we as scientists look at  
10 data. I didn't do that here. And I'm glad, in light of  
11 the cross-examination that I see -- I saw Mr. Gookin go  
12 through. I thought Mr. Gookin did more than a fair job  
13 of what his evaluation of flows in the middle Gila were.  
14 Anyone, we all know, who creates a model is going to be  
15 open to attack. It's just the nature of the business,  
16 because there are assumptions. There are unknowns. And  
17 sometimes you go out on a limb, and you counsel just  
18 love to zero in on where we're unsure as scientists  
19 about what number to pick or how to do something.

20           I simplified things, and I bore the Commission  
21 with that rambling. I think it's important though,  
22 because I approach this in a simplistic way that in my  
23 opinion, at least -- and I'm sure I'm going to be told  
24 otherwise -- is conservative.

25           When I say conservative, that needs to be

1 explained. Conservative in the flow depths, flow  
2 quantities that I predict through my flow  
3 reconstructions I believe are overestimates or at least  
4 are at the highest level of what could reasonably have  
5 occurred based on the data that I looked at. They are  
6 not, as we'll get into in more detail -- there were  
7 certainly opportunities. Maybe I'll just put it this  
8 way and I'll walk through some examples.

9           There were opportunities where I could have  
10 made my numbers lower, and I'll explain that to the  
11 group. The table that I referred to a lot where I  
12 summarize all my data, it's not -- it wasn't an accident  
13 or a typo where all those numbers are "less thans". And  
14 it was interesting when I saw Mr. Fuller's slide, my  
15 "less thans" all disappeared in my summary of those  
16 depths. But the "less thans" are to me a really  
17 important part and explains what I did. So I'll get  
18 into that in a minute.

19           But here's what I did. In the simplest way,  
20 kind of like your checking account, with  
21 simplifications, and hopefully the simplifications  
22 you'll hear that I made are again, lead to greater  
23 depths, greater flow quantities than if I had been more  
24 rigorous in my analysis.

25           I did a flow accounting in the simplest way.

1 Commissioners, we all know that you can read the  
2 Winkleman decision. Hey, you got to put the diversions  
3 back in. I get it. I really get it, everyone. I  
4 understand. How do you do that is a lot easier for a  
5 judge to say put the flows back in than to practically  
6 do it in a defensible way and to have enough data that  
7 you can put it back in.

8 I'm sure I'm going to be criticized, gosh,  
9 Burtell, you're way in the 1930s by now. I heard  
10 cross-examination with Mr. Gookin about you're using the  
11 White Book. Now we're in the 1914 and '40 range.

12 I was confused by that because they're trying  
13 to reconstruct virgin flow. That's our game here is to  
14 turn the clock back to what the river was without  
15 diversions. And what time period you do to reconstruct  
16 what it was before diversions, I don't think is terribly  
17 important. What is important is you have enough data to  
18 try to do those reconstructions.

19 Q. You need to know how much water to put back in  
20 at its simplest form?

21 A. And the problem is, and we all know this. I'm  
22 not saying anything everyone hasn't heard a million  
23 times, is that -- and Winkleman was clear on this -- is  
24 you go back too far, you just don't have the data. So  
25 us hydrologists paid a lot of money to try to figure

1 out, well, how the heck do we do it. We don't have  
2 data. So you want us to go back far, but there's no  
3 data. And if we use too recent data, you're forced to  
4 do what Mr. Fuller had to do, is say, hey, I'm just  
5 going to present the data where the flows have already  
6 been affected. And that's what his group did. And I  
7 don't take issue with that. That certainly is not as  
8 difficult as using existing data and just say, hey, they  
9 are what they are, than to actually try to turn that  
10 clock back.

11 Mr. Gookin and I tried to turn the clock back,  
12 for better or for worse, and I heard a lot of criticism  
13 and concerns about how he did it. I don't necessarily  
14 share all of those.

15 My method is a little bit easier in my mind in  
16 terms of how I did it. I didn't use the Manning's  
17 equation; but if you guys want me to cite it, I can. I  
18 used the continuity equation, but not, perhaps, in the  
19 way that he did.

20 So getting back, how did I do it? There's a  
21 lot of diversions in the upper Gila. We all know it's a  
22 rich agricultural district. That's a good thing and a  
23 bad thing. It's good because of all those agricultural  
24 districts and the Globe Equity Decree and the Dome  
25 Decree that preceded it, that they kept track, believe

1 it or not, of many of the major canals, how much water  
2 was getting diverted. So we actually, believe it or  
3 not, we've got the records.

4 We also are fortunate, I think, in the upper  
5 Gila to have a handful of stream gages where we can do  
6 some reconstructions on. So I made benefit of that.

7 What I did in the simplest terms is I took all  
8 the water that I could find records on that got diverted  
9 out of these streams at these diversions and plopped it  
10 right back into the stream.

11 But I heard something yesterday that kind of  
12 caught my mind that further reiterates the conservative  
13 nature of what I did, is when I put the water back in  
14 the stream -- I think maybe it was Mr. Sparks that was  
15 going on this line of questioning with Mr. Fuller; but I  
16 put all the water back in the stream right at the gage  
17 site. And the reason why that's conservative -- or let  
18 me rephrase -- that leads to, I think, more flow than  
19 one would estimate is, what's actually happening, is  
20 that all along these rivers or all along these stretches  
21 there are diversions. Water gets diverted out.

22 And then based on research I did, water comes  
23 back in. Either they've diverted too much out and  
24 there's a canal spill, or there's irrigation return  
25 flow, and that can either be direct runoff; it can be

1 seepage down into the subsurface. It comes up in its  
2 base flow into the river. That water that naturally, or  
3 I should say just comes back into the river on its own  
4 accord after you divert it, then goes downstream and is  
5 measured by the gage.

6           So if there's any confusion about me double  
7 counting, that's what I mean by that. Because all of  
8 that water that gets diverted, I assume none of it comes  
9 back on its own. But I put it all back in right above  
10 the gage site.

11           And the other thing --

12       Q.     Let me just clarify. You were in a sense  
13 double counting, but to the benefit of greater depths?

14       A.     To the benefit of greater depths and --

15       Q.     And that's because some of those return flows  
16 and the spill water essentially gets counted twice?

17       A.     It gets counted twice because if it comes back  
18 in and wanders on down, it's going to hit the gage site  
19 and be part of what the gage measures. But I'm putting  
20 it all back in assuming none of it comes back in on its  
21 own.

22           And then the other thing I did is, these are  
23 long stream courses. There is a lot of vegetation along  
24 these rivers.

25           Needless to say, when you take the water out

1 of a stream and it then comes back in, if it's, let's  
2 say, five or ten miles before where you diverted it and  
3 where it came back in, there might be ample opportunity  
4 for that water to get sucked up by plants that are  
5 growing along the stream, phreatophytes,  
6 evapotranspiration. We've heard about that.

7           Once again, I take all that water and dump it  
8 right at the gage. So I don't give the water that I'm  
9 putting back into the river any opportunity to get lost  
10 by plants along its way back down to the gage. And  
11 maybe -- and I think we can smile on this one,  
12 Mr. Fuller. I didn't hear a lot of complaints about my  
13 flow numbers. And I think perhaps that is, it  
14 perhaps -- I don't want to put words in Mr. Fuller's  
15 mouth or anyone else's -- that perhaps everyone would  
16 agree that my numbers, at least on the quantities of  
17 flow, are on the high side, or certainly, I'm not -- I'm  
18 not underestimating.

19           Q.       They are very conservative at a minimum?

20           A.       I would hope that if anyone comes away with  
21 anything on my flow reconstructions is that they're on  
22 the high side.

23           Q.       In terms of these return flows and these other  
24 opportunities for water to get back in the river and  
25 essentially get double counted, do you have any

1 estimates on a percentage basis or otherwise what the,  
2 sort of what the magnitude is that we're talking here?

3 A. Yeah, and I'm sure Freeport and my counsel  
4 would have loved for me to have enough confidence to  
5 pick a number; for certain, you know, Rich, how much is  
6 coming back in that we can defend.

7 Well, I tried my best to present the data that  
8 I had about how much was coming back in, and it's  
9 variable. I saw some early USGS studies that are  
10 described in my Paragraph 74 that would suggest that,  
11 you know, some 30 or 40 percent return flows.

12 I'm aware in the Dome Decree that the Dome  
13 Decree is kind of interesting in that it actually talks  
14 about the fact that about one and a half times more  
15 water is diverted in the Safford Valley than comes into  
16 the Safford Valley. And that's understood by everybody.  
17 Well, where is that other 50 percent of water coming  
18 from? So it's no mystery that water --

19 Q. Because it gets diverted twice, return flows?

20 A. It's getting diverted twice, and it's even  
21 recognized in the Dome Decree. The devil is in the  
22 details. It's what number do you pick. And I'm afraid  
23 I would have gone through an exercise like Mr. Gookin  
24 yesterday if I'd picked a number and the other side  
25 doesn't like it; there would be this unbelievable

1 discussion about what is the return flow along the upper  
2 Gila.

3 Q. We'd all rather have dinner with our families  
4 tonight, so you avoided that.

5 A. So I chose to ignore it. Not that I don't  
6 think that it causes an overestimation of the flows, but  
7 let's just say if my reconstructions led to much greater  
8 depths, then perhaps I would have looked at it more and  
9 tried to refine it or created a range.

10 But I realized that the depths that I was  
11 reconstructing without attempting to account for what  
12 those return flows are, in my opinion of what -- if  
13 you're just looking at depth as a factor, that I didn't  
14 need to go down that road and bring more uncertainty  
15 into the exercise. And counsel love -- I've done this  
16 enough, I know that if there is a whiff of uncertainty,  
17 you guys are like bloodhounds. You go right towards it  
18 and off you go. So I tried to take that, a little bit  
19 of that out of the picture.

20 So, that's -- and again, I go into some more  
21 detail. I will make one point perhaps that's a figure.  
22 One thing that you wouldn't want to do, I think everyone  
23 would agree, is to do a flow reconstruction during a  
24 time when it's really, really wet. We're trying to look  
25 at natural and ordinary. So natural conditions, I

1 understand, are supposed to be absent floods and  
2 droughts.

3 Well, if you were doing a flow reconstruction  
4 during a really, really wet decade or really, really dry  
5 decade, I'm not sure that would be as much benefit to  
6 the Commission as if you can pick a period otherwise.

7 So I will direct the Commissioners to one of,  
8 I think it's my last figure that shows this tree ring  
9 analysis that was done. And Figure 10 shows, they  
10 went -- I only show 1820 through 1940, which is, you  
11 know, Pattie was there in I think 1825 on. So kind of  
12 gives some context about when we have our first written  
13 records of someone passing through the area. And I took  
14 it through 1940. Believe me, the data go on, obviously.

15 If you look up in that box, the flow actually  
16 reconstructed goes back to 1332. So we can go back  
17 pretty far in time. But what I wanted to make sure in  
18 the generalist sense, everyone, is that when my flow  
19 reconstruction was done, I wasn't picking a period that  
20 was unusually wet, which perhaps would not help the  
21 position that I'm advocating. But I also wouldn't want  
22 to pick one that's really low, because then I'll get  
23 grilled by opposing counsel that, hey, I'm picking a dry  
24 period; that's why the flows aren't so low.

25 Q. You wanted an ordinary period of time?

1           A.       I wanted as natural and ordinary as I could,  
2 or ordinary. And my flow reconstruction was in early  
3 1920s through 1930. And if you take a look at the green  
4 dots, that is actually the reconstructed flows for that  
5 period. You can see there are some points below and  
6 some points above the median. Usually I'm not so lucky,  
7 but my flow reconstruction when I had some good  
8 diversion data, I had stream flow data. I also had a  
9 period -- oh, prior to groundwater pumping in the area,  
10 major groundwater pumping. I also have a period where,  
11 take a look, it's not that wet or that dry. This isn't  
12 a bad period to take a look at. So that's what I did.

13                   My reconstructed flows are in Table 10. And  
14 I'm sure we'll be talking a bit about Table 10, if not  
15 this morning, this afternoon. And this is where I  
16 summarize all of this.

17                   What you'll see in Table 10 is the stations  
18 where I reconstructed the flow. The median flows, which  
19 I reconstructed -- I did this on a monthly basis, and,  
20 you know, arguably, everyone, I could have avoided this  
21 whole exercise, arguably, because I could have fallen  
22 back on the Krug analysis or the White book analysis,  
23 both of which have been discussed this week, both of  
24 which include average annual flow estimates at several  
25 of these gage sites. So I could have stopped there.

1 And you might argue, well, Burtell, why did you go  
2 through the pain of doing this? Well, one thing that  
3 this does is it provides another evaluation, an  
4 independent estimation of what these flows are. But I  
5 looked at monthly data and they looked at annual. So I  
6 was also interested in knowing what months of the year  
7 these flows or what type of flows were occurring  
8 reconstructed on a monthly basis. So my reconstructions  
9 are monthly.

10 The median flows are listed here as opposed to  
11 an average flow. And then the cross reference in the  
12 far right column is, you might say, well, great,  
13 Burtell, where did you get the numbers or where did  
14 these come from? That's the cross reference to where I  
15 got them.

16 So in many of the tables -- and I will not  
17 bore you guys with them, but I'm sure I'll be  
18 cross-examined on them -- I do my accounting. I try to  
19 look at all the diversions or the water used by mines  
20 and people, and add that to the gage data, sum it up.  
21 All of those are in preceding tables to try to  
22 illustrate to folks what I did, and that's then put in  
23 these tables as the median flow number.

24 There are a couple of gages at York, below  
25 Bonita Creek, near Ashurst and at Calva where I didn't

1 have flow records for my period of record. Okay? So  
2 you would say, well, then why do you have them in here?  
3 Well, what I did is I used the flow data at the gage  
4 closest to it downstream, and essentially routed that  
5 water, strange as it might sound, upstream. And the  
6 reason I did that is I wanted to be able to not just  
7 look at four points, but expand the number of points  
8 where I can take a look at what these depths are.

9 I understand that when you route water  
10 downstream or upstream, you better be pretty careful.  
11 The biggest concern you would have if you're routing it  
12 upstream is if there's a lot of, if there is a lot of  
13 loss between upstream and downstream, then you're taking  
14 a lower number downstream and moving it upstream. You  
15 don't want to do that. And that would happen, in my  
16 opinion, primarily in the summertime when all of those  
17 phreatophytes are pumping water. So if you've got  
18 Point A is upstream and Point B is downstream and you're  
19 trying to take the records from B and route them back up  
20 to A, if you do that in the summertime when between A  
21 and B you can have a lot of losses in between, that  
22 could give you an artificially low number where you're  
23 routing it upstream, because that water would have been  
24 lost.

25 So when you look at my Table 10, you see those

1 big "not available" boxes. That was my concern that I  
2 better not be routing that water upstream during the  
3 summertime, because I will be accused -- and I would  
4 be -- of potentially underestimating flow at that gage  
5 that I routed it upstream to.

6           Been a lot of discussion, and I'll give you my  
7 ten cents worth on, well, okay, you also have mean  
8 depths and average velocity. Mr. Fuller and I are in  
9 agreement -- and I know Jon understands and realizes  
10 there are a lot of other factors -- and I think it's  
11 unfair to say, well, it's not just the depth. But I  
12 think Mr. Fuller and I are in full agreement that depth  
13 is a critical factor in evaluating navigability. It's  
14 not the only factor, and you could argue, I would argue,  
15 that historic evidence of boat use is a stronger factor.

16           But from a susceptibility standpoint, depth of  
17 flow is a player, and we've got to look at it. And so  
18 I've attempted to do that.

19           So I've reconstructed these median flows  
20 month-by-month. Well, what does that mean in terms of  
21 the equivalent depth?

22           I would turn the Commission's attention all  
23 the way to the very end of my report, which are my  
24 rating curves. Now, I --

25           Q.       And these are Attachment --

1 A. Attachment E.

2 Q. -- E?

3 A. Now, I, having gone through the Santa Cruz  
4 case, unfortunately, we didn't have an opportunity to  
5 talk to Mr. Hjalmarson at that hearing. He did not  
6 testify. But he had grave, I think would be a safe, in  
7 light of his words, a grave concern about my  
8 understanding of hydrology and certainly my  
9 understanding of rating curves and use of field  
10 measurement data.

11 I will say that I worked for the U.S.  
12 Geological Survey, not for as many years as  
13 Mr. Hjalmarson, and you folks will probably appreciate  
14 with how hot the summers are here. I can assure you  
15 summers in Florida are hotter than summers here, maybe  
16 with the exception of Yuma. Yuma gets pretty toasty and  
17 humid.

18 But what I did --

19 CHAIRMAN NOBLE: Mr. Burtell, your credibility  
20 just took a hit.

21 THE WITNESS: Well, I'm sure in many ways, but  
22 can you explain in what way?

23 CHAIRMAN NOBLE: It's a dry heat.

24 THE WITNESS: Well, I don't disagree, except  
25 when I was in Yuma and it felt really like a wet heat to

1 me.

2 CHAIRMAN NOBLE: There's nothing worse than  
3 100 degrees and 100 percent humidity. That's the  
4 killer.

5 THE WITNESS: Yeah, and that is what I  
6 witnessed. And I say that not so jokingly because when  
7 I was in Florida -- and we'll all appreciate, those of  
8 us who are hydrologists -- they have a lot of sand  
9 channels. And I was out there doing stream gaging, and  
10 what I was out there doing was looking at doing  
11 adjustments to rating curves. And so we would get a  
12 storm that would go through, and, of course, when I did  
13 the corrections, what was most entertaining is after a  
14 hurricane had gone through and the rating curves really  
15 changed. So I understand what field measurements are.  
16 I understand how those are used for rating curves.

17 I remember Mr. Hjalmarson took almost extreme  
18 issue with my lack of understanding that you take field  
19 measurements at different points, not necessarily all  
20 exactly at the gage. My experience was out there is  
21 after a storm event, you sometimes couldn't get exactly  
22 near the gage, so you might have to move fifty or a  
23 hundred feet downstream.

24 Your goal, as I understand, is to take a flow  
25 measurement close enough to the gage that you know what

1 the discharge is, and then you're relating that to the  
2 stage or the depth of flow at your gage site. That's  
3 your goal.

4 Those field measurements are critical for our  
5 purposes, and the reason I say that, and Mr. Fuller, not  
6 in this report, but in his San Pedro report, he actually  
7 has some wonderful graphs, very similar to Mr. Gookin's  
8 graphs, where he takes all these field measurements and  
9 plots them and shows the relationship between discharge  
10 and mean depth, velocity, and width.

11 If you look at my rating curves, and let's  
12 just look at one as an example. Look at the first one,  
13 Figure E-1. You might say, well, wait a minute. Wait a  
14 minute. Mr. Fuller and Mr. Gookin's curves are straight  
15 lines. You've got curves. The only difference between  
16 what I saw in the San Pedro report and what Mr. Gookin  
17 did is they plotted theirs on log-log paper. So this  
18 power line turns into a straight line on log-log paper.  
19 It's the same data. It's just how you plot it.

20 But I think the key is, what I want to point  
21 out, and I want to say to the Commission that, and to  
22 the parties, that a weakness -- not a weakness of my  
23 report, but I should have been more clear about this  
24 line. I didn't use this line. This line is a best-fit  
25 line through the data points. And what this best-fit

1 line is is very similar to the straight line that  
2 Mr. Gookin had on his figures and I saw in Mr. Fuller's  
3 report. It's the best-fit through that data. And if  
4 you plot it on log-log paper, it's a straight line, not  
5 a power function line. You take the power function line  
6 and plot it on log-log paper, try not to get too  
7 technical. It turns into a straight line.

8           When you look at my reconstructed depths, when  
9 I took those flow values, and then used these tables to  
10 come up with the flow depths, I didn't use this line.  
11 This is a best-fit line that I could have used. Other  
12 people have used such a line. If I had used it, I would  
13 have had less depths.

14           If you look back at my Table 10, notice that I  
15 have "less thans". And the reason I did "less thans" is  
16 that I understood having -- even though Mr. Hjalmarson  
17 might not believe that I understand, I know how variable  
18 sand channels are based on my experience both in Arizona  
19 and in Florida with the USGS, and certainly in my work  
20 over the years how much channels change. And I know  
21 that even if you just pick the best line, there's always  
22 going to be numbers above it and there's always going to  
23 be numbers below it. If someone is going to argue,  
24 well, wait a minute, there have been times out there  
25 when you actually measure the stream that had a certain

1 flow, it's a lot deeper than that. So why are you  
2 picking the line that goes right through the middle?  
3 You got numbers above it; you got numbers below it.  
4 What's the number?

5 In my attempt to, again, be conservative and  
6 not in any way underestimate flows, I didn't use this  
7 line. I focused more on where the majority of the data  
8 were and said, hey, it's no more than that. It's less  
9 than that. So pick a certain flow. I didn't come up to  
10 this -- if people think -- and this is where I apologize  
11 to the Commission and to people reading my report. I  
12 should have made it clear that if I pick a reconstructed  
13 flow and come to this chart, I didn't come to the  
14 discharge and then work my way up, hit the line and say,  
15 ah, that's what my flow depth is.

16 I used less than the flow depth. So what I  
17 did is I looked at all the data, and I was more worried  
18 about an envelope, but what's the upper envelope of the  
19 data.

20 Now there are occasionally a few outliers that  
21 are so outlier that I didn't use them because they  
22 didn't seem reasonable to me. But I'm not using the  
23 best-fit line. I'm using the majority of the data  
24 absent any outliers and saying, hey, based on these  
25 data, it's not any more than that. It's less than this

1 amount. So that's what I did.

2 So what I did then is, where did I get these  
3 data? Well, like Mr. Gookin, or in this case Dr. Mock,  
4 I went to the USGS. They have these historic data on  
5 microfiche. I spent hours in the library copying these  
6 field measurements. I cannot tell the Commission in  
7 light of all that I've heard about arguments with  
8 Mr. Hjalmarson and Mr. Gookin and others about what the  
9 slope is of the river, what is the "n" factor of the  
10 river? Is your cross section accurate or not? I  
11 fortunately can avoid all of those discussions because  
12 I'm using not a modeled estimate of what the depth is  
13 and what the flow velocity is. I am using actual  
14 values.

15 Now, Mr. Hjalmarson -- and I don't mean to  
16 keep bringing in the Santa Cruz, but in terms of  
17 criticisms of what I've done in the past, I think it  
18 might be relevant. What I did was I'm actually  
19 embracing the variability. As I recall, Mr. Hjalmarson  
20 was extremely critical of the fact that, hey, you  
21 can't -- you know, these rating curves change and you  
22 can't be using measurements that are upstream and  
23 downstream. Well, the USGS compiles all of these  
24 measurements associated with a given gage, and  
25 periodically, those rating curves change. And I've

1 modified them. I'm not trying to do a rating curve for  
2 the gage, in no way, shape or form.

3           What I'm trying to do is capture what is the  
4 full range of depths or velocities at a given discharge  
5 on a given river. Not based on a model and the  
6 Manning's equation and estimates about things, but based  
7 on field data.

8           And you can argue that I don't have enough  
9 data. You can argue that I should have looked at more  
10 data. But I used the data we have. I think we are  
11 somewhat fortunate that these old records of actual  
12 field measurements are available through the GS, and we  
13 can utilize them. It's not easy. You can't get these  
14 online. You've got to go down there and you've got to  
15 go through the fiche, and it's painful. But I think  
16 it's valuable. And so that's what I did.

17           So that's a summary of how I got the numbers.  
18 The same approach with rating curves that I use for mean  
19 depths I also did for average velocities. And so  
20 similarly to less than, using the upper envelope for the  
21 mean depths, I did the same thing with the velocities.  
22 The velocities were at least this much, and those are  
23 listed in here accordingly.

24           What did I come away with from this exercise?  
25 Understanding that if I had been smart, I probably

1 should have just used the values -- it would have been a  
2 lot easier for me if I had just used the average annual  
3 data that were in the Krug book and in the White book.  
4 I could have just stopped there. None of my conclusions  
5 would have been different, because if you use the  
6 average annual flow data that you get from those other  
7 books, not try to do monthly median flows, but use their  
8 average annual flows and put them into my rating curves,  
9 you still get less than two feet of flow.

10 I'm sure that the proponents of navigability  
11 probably would do a handstand over that, because two  
12 feet of flow may be in their minds enough, more than  
13 enough for navigability.

14 Q. It's more than six inches, isn't it?

15 A. It's more than six inches. So maybe that's  
16 why -- although I'll find out this afternoon --  
17 Mr. Fuller wasn't more concerned with my numbers. I  
18 don't know.

19 But I feel strongly, particularly with these  
20 conservative assumptions that I used, that I'm less than  
21 two feet. And if I had done what a lot of hydrologists  
22 have done, and that is use the best-fit line, use the  
23 center of the data, the central tendency of the data  
24 which I plot as a curvy line, which on log-log paper is  
25 a straight line, if I had used that, you would see that

1 typically it's about, you know, a half a foot less in  
2 terms of depths, if I had used that centroid value  
3 rather than the upper value.

4 Q. You started to compound that best-fit line  
5 plus accounting for return flows. You're talking about  
6 even much less depth than your less than two feet?

7 A. If one were -- and maybe others would go  
8 further out on a limb than I chose to -- to assume that  
9 30 to 40 percent of the diversions in the Duncan and  
10 Safford Valley returned to the river, then that would  
11 drop the flows less. And so then you have less flows,  
12 and I'm using not the best-fit line -- I mean, I'm using  
13 the upper envelope and not the best-fit line. So I'm  
14 coming in high in my opinion. I'll let others decide if  
15 I've done a fair job of that.

16 I feel that generally based on these data,  
17 regardless of the month and where you're at, that it's  
18 typically less than two feet of water, average depth of  
19 water across these watercourses.

20 And one last point, this is when it was a  
21 single channel. I should point out that, which is kind  
22 of another conservative thing to throw in here; and that  
23 is, keep in mind that when I looked at the actual field  
24 measurements, the USGS would note on their, it's a form  
25 9207, whether or not the channel was a single channel or

1 whether it was multiple channels. So when it was  
2 multiple channels, they didn't put the field  
3 measurements on that form. So I didn't account for the  
4 time when it was multiple channels. This is just when  
5 it's a single channel. So at times when it's a multiple  
6 channel, it would be less than that. So something again  
7 to keep in mind.

8           So there you have it. And again, I feel that  
9 the proponents of navigability and the opponents of  
10 navigability are going to maybe argue more about what  
11 depth would be considered proof of susceptibility to  
12 navigation, and there's disagreement, I think, on the  
13 two sides about what that is.

14           I say with confidence that based on my  
15 analysis of reconstructing the flows that along most of  
16 the upper Gila River, less than two feet of flow,  
17 average flow depth at these various points.

18           Q.     How did that compare with some other  
19 adjudications of navigability and other standards  
20 relating to navigability?

21           A.     Yeah, I'd like to get into that. And I know  
22 that people may discount the opponents -- or the  
23 proponents of navigability might discount a bit the Utah  
24 decision. But there was something in the Utah decision  
25 that I think is worth getting on the record. It's in my

1 report. But if I could turn the Commission's attention  
2 to my Paragraph 88.

3 Now, like me -- and obviously he did a better  
4 job probably than me -- the Special Master in the Utah  
5 case looked at a lot of different things. I tried to,  
6 and he did, too. And he looked at historic boat views.  
7 He looked at flow depths. He was again focused on three  
8 rivers, as I understand it, the San Juan, the Grand and  
9 the Green.

10 He utilized lots of different lines of  
11 evidence, and I tried to do the same, and leave it to  
12 the Commission's mind as to whether we all have done a  
13 fair job, and hopefully give you guys enough lines of  
14 evidence that you can do your job.

15 This one particularly struck me, and if I can,  
16 I'd like to read. In Paragraph 88, the Special Master,  
17 among other things he looked at, had the benefit of a  
18 survey that had been done by the federal government on  
19 the navigability, and I'm not -- and I'll make  
20 misstatements, because I don't always understand the  
21 difference between federal for -- I mean, I understand  
22 federal -- the difference between the federal test and  
23 the state test. I understand Daniel Ball, and I  
24 understand those nuances. But this navigability  
25 survey -- I don't know if this was being done for a

1 federal title case or what. But they had surveyors out  
2 there trying to figure out from a practical perspective  
3 what boats could be used on the Green and the Grand  
4 Rivers.

5           And a couple things about this, I think, that  
6 are relevant to the Commission. This was conducted by  
7 the War Department, November 1908, so just a few years  
8 before we became a state here in Arizona. So they're  
9 looking at these rivers. And I, you know, reading the  
10 accounts, they went up and down these rivers taking lots  
11 and lots of depth measurements; and what was put in the  
12 Special Master's report is they did both a high water  
13 survey and a low water survey, and those of us who have  
14 spent time on those rivers know that the low water --  
15 well, I'll just say, it's easier to say what the high  
16 water is. When the snowmelt hits that area, it's my  
17 experience on the river has been if you want higher  
18 water, May, June, and maybe the beginning of July is  
19 when things are kind of fun there, if you will -- using  
20 Mr. Fuller's phrase -- to be on the river if you want a  
21 bit higher flows. But they weren't there at that time.  
22 This was done, as I recall, in November when the water  
23 is lower.

24           And let me just read the account. The survey  
25 found that there are many crossovers in both rivers

1 which have a depth of between two and a half and three  
2 feet during the low water stage. This depth is  
3 sufficient for light draft boats suitable to these  
4 rivers. And three feet is therefore taken as the  
5 governing low water depth. To be considered in  
6 improvement, the maintenance of a greater depth is not  
7 warranted by the probable commerce.

8           So I know we're going to have a lot of  
9 discussions this afternoon about Mr. Burtell's view of  
10 what commerce is. I'll let the federal government speak  
11 for itself here at this time considering boats on this  
12 river. They were considering low draft boats and  
13 commerce as of 1908, a few years before our statehood;  
14 and similar to Mr. Gookin, I think this is, this three  
15 feet is not something that can just be discounted out of  
16 hand. I think this does have some value, and so did the  
17 Special Master. If you look, continuing on, and if you  
18 don't mind, I'll read this, too.

19           The War Department states, "While not binding  
20 on the United States, this record of this survey has a  
21 certain amount of relevancy. I find that the  
22 conclusions as to depths, velocities, etc., are amply  
23 confirmed by the evidence in this suit as to actual boat  
24 trips on these rivers made by witnesses."

25           Students of the Utah decision and Special

1 Master's report knows that he literally -- maybe a  
2 hundred is too much, but I've read through many of them.  
3 He had lots of witnesses that boated on those rivers.  
4 So I think what he did is he took all of those accounts  
5 of those folks boating down those rivers and was saying,  
6 he's putting that into context of what these federal  
7 surveyors said about the commercial navigability.

8           The last thing that I looked at before we then  
9 go to maybe boats that we have evidence on the upper  
10 Gila is, and this was something that was actually  
11 brought to my attention looking at one of the  
12 post-hearing briefs that was filed related to  
13 Mr. Hjalmarson's, I think, analysis using the  
14 Langbein -- if I'm pronouncing that correct -- analysis  
15 of susceptibility for upstream navigation. Langbein was  
16 a fellow from the USGS, and what he looked at, my  
17 understanding is that he was focused on what type of  
18 river conditions would be conducive to upstream  
19 navigation. Not downstream navigation or floating, but  
20 the whole issue about whether you can go upstream.

21           And I fully understand that there's nothing  
22 that says that you have to be able to move upstream to  
23 have a navigable river. I understand that fully. I  
24 think though it is a factor that has to be considered,  
25 among many factors, about whether or not you can go

1 upstream in a boat.

2           So I thought, well, why not do this? I've  
3 spent all this time reconstructing flows month-by-month.  
4 I've got depth data. I can get velocity data using  
5 these same field measurements so why not go through the  
6 exercise, as Mr. Hjalmarson did for the lower Gila, and  
7 see how my flow reconstructions would stand up to the  
8 Langbein analysis.

9           And what I found is that if you take those  
10 Langbein numbers, you would find that they don't. My  
11 reconstructed flows, which again I feel are  
12 conservatively on the high side in terms of depths and  
13 velocities, would not satisfy, at least in Langbein's  
14 mind, based on his analysis, something that would be  
15 commercially viable in the upstream direction, but  
16 upstream direction only.

17           And this might be one interesting opportunity.  
18 I did kind of a test on Langbein using the Colorado  
19 River. And based on some testimony this morning, I  
20 think it might be useful. I know people hate footnotes  
21 because nobody reads them. We all love to put it in  
22 there and then nobody ever reads them; but if I could be  
23 so bold to have the Commission actually look at my  
24 footnote on Page 20. And in hindsight, I wish I hadn't  
25 made it a footnote, maybe based on testimony this week.

1 I have to admit there's a bit of irony here because this  
2 information actually was in -- I can't remember, and,  
3 please, somebody remind me. It was a report that was  
4 either entered by the State Land Department or the  
5 county related to the history of the Colorado River.  
6 And when I looked at that, when I was looking through  
7 all the lines of evidence that we're all throwing in  
8 last minute, there was actually quoted in that document  
9 were flow measurements that Wheeler made way back in, I  
10 believe it was 1876, on the Colorado River, and 1875,  
11 where he actually was out there measuring what the  
12 depth, the velocity, and the width of the Colorado River  
13 was at a pretty early time.

14 And I think what's interesting about this is  
15 just, compared to the Gila River in my flow  
16 reconstructions, at least, just how deep the Colorado  
17 River was at this time.

18 And I should point out, we know he was out  
19 there in March at Yuma and September at Camp Mohave.  
20 That's a time, again, students of the Colorado River  
21 know that that's not high water time or where the water  
22 is due to snowmelt is higher. That comes, again, my  
23 experience is more May, June, maybe by the time you get  
24 down to the lower Colorado, maybe you're heading into  
25 July a little bit. But needless to say, when they were

1 out there in March -- having lived in Colorado, the snow  
2 hasn't melted much yet in March, and certainly  
3 September -- they weren't even out there when it was  
4 high flow. But take a look at these depths. The  
5 Colorado River at Yuma where all these steamboats were  
6 going crazy, a little under six feet mean depth,  
7 velocity, 2.8 feet. You can see the discharge heading  
8 towards 8,000 cubic feet per second. Certainly the  
9 discharges that I looked at and I reconstructed were  
10 substantially less than that, order of magnitude, I  
11 would say.

12 September, going upstream, so he must have  
13 started -- he must have taken his measurements from an  
14 upstream to downstream direction. In September he was  
15 up at Camp Mohave, and there the mean depth was four  
16 feet, a little over four feet, and velocity about two  
17 and a half feet. I took those -- and you can see the  
18 cubic feet per second was 11,000, a little over 11,000.  
19 I took those data and put them into Langbein thinking,  
20 hey, we've got all these steamboats going up and down  
21 the river. We know there's steamboats. We know there's  
22 commercial boat travel. I don't think anyone will argue  
23 with us there. How does Langbein hold up?

24 So I put those numbers in, and sure enough,  
25 for Yuma, Langbein would say, yeah, it passes his test

1 for what would be viable in an upstream direction.

2           And Camp Mohave, the Langbein numbers are a  
3 bit higher, indicating it would be a little less  
4 susceptible; and ironically, that was where, based on  
5 Lingenfelter's research, where steamboat traffic on the  
6 Colorado River became a little bit more dicey, where  
7 north of Camp Mohave, it was more typical for them to  
8 take trips up the river during the higher flow season in  
9 that period further up. Now, they went quite far up.  
10 They went all the way up to where now Hoover Dam is.  
11 But those areas were a little less successful unless it  
12 was higher water, and Langbein kind of confirms that.

13           The reason I wish I had put this bullet in the  
14 main text is it's a contrast of the Colorado River which  
15 we know was commercially navigable; and again, I would  
16 think that everyone in the room would agree to that  
17 based on Lingenfelter's book, among others. And the  
18 type of depths that Mr. Gookin and I have reconstructed,  
19 we're talking about a different world in terms of flow  
20 depths. Certainly, a different world than Mr. Fuller  
21 and the six-inch argument. It's just a very different  
22 opinion, and I guess it will be left to the Commission  
23 to decide whether six inches or two feet or four feet,  
24 what's needed. But there was some pretty good water  
25 where they were actually using boats.

1 Q. And with the kind of depths that you  
2 identified for the Colorado River, we do have a pretty  
3 vibrant, I think you said, commercial navigation economy  
4 going on. We have an absence of that on the Gila, and  
5 we certainly have a historical record of that commerce  
6 on the Colorado River; isn't that right?

7 A. Yeah. And, you know, the argument that I'm  
8 sure -- I know I keep saying it. I'm sure I'm going to  
9 hear about it this afternoon. What strikes me is this  
10 argument, well, when there was water, we didn't need it,  
11 but then when we needed it, there wasn't any water. I  
12 struggle with Mr. Fuller's use of that argument with  
13 respect to this. If you look at Dr. Lingenfelter's  
14 book, trying to remember what the last date is, wherever  
15 the book is. But it starts with 1851.

16 CHAIRMAN NOBLE: '52.

17 THE WITNESS: Or 1852, excuse me. And it goes  
18 to 1916. And he's got pictures and descriptions.  
19 Starting in 1852, the steamboat industry along the  
20 Colorado River admittedly was in its infancy, but boy,  
21 it grew quickly. And I think the boating pictures, the  
22 accounts, the newspaper articles suggest that by the,  
23 even the early 1860s, which I've heard bantered about in  
24 this courtroom about what might be a time when Anglo  
25 diversions just were starting.

1           Boy, by 1860 you had a vibrant, vibrant  
2 boating operation along the Colorado River. Now, 1860,  
3 think about what's going on up in my neck of the woods  
4 up in the upper Gila. There was a military base up  
5 there. They certainly could have benefited from a boat  
6 getting all the way up there.

7           This concept about technology moving slowly or  
8 having a hard time to progress. That's just, that's  
9 just inconsistent with my knowledge of how mines got  
10 developed, and certainly if you just look at how quickly  
11 the boating industry on the Colorado River developed,  
12 it's hard for me to get my arms around. I don't know  
13 how else to say it to the Commission. It's hard for me  
14 to understand how, if the Gila River in the 1850s, you  
15 could get a boat up there, and they're clamoring for  
16 ways, cheap transportation. They wanted the railroad  
17 desperately so they could develop and explore. I'm not  
18 going to argue about what they did was right or wrong.  
19 But the entrepreneurial spirit at that time was so  
20 palpable and strong. If the Gila River could have been  
21 used in the 1850s when the boat technology was there and  
22 it was a vibrant technology, why they didn't use it, I  
23 just can't understand.

24           And no offense to Mr. Fuller, but the argument  
25 that, well, there were roads and they just didn't, you

1 know, it was slower and they just didn't use it, just  
2 doesn't, just doesn't work for me. I don't know how  
3 else to put it.

4 Q. Well, that takes us then, let's go to your  
5 table and your discussion about the very few instances  
6 that we have of someone trying to put a boat in the  
7 upper Gila.

8 A. And I think, fortunately for the Commission  
9 members that are probably getting pretty tired of  
10 hearing all this on Friday, fortunately or  
11 unfortunately, depending on one's perspective, there  
12 wasn't a lot of historic boating evidence in the upper.  
13 There is, and I sat and witnessed, there has been  
14 tremendous quantities of time spent discussing the  
15 viability or the success or failure of boating ventures.  
16 Fortunately for me outside of my area, a lot of these  
17 occurred, as I understand, in what's now the Phoenix  
18 area heading on down to Yuma.

19 But if you turn to my Table 15, and Mr. Hood,  
20 through his cross-examination of Mr. Fuller, unless I  
21 missed it, I didn't get the impression that there was  
22 anything that would be necessarily added to this table.

23 Q. Let me just, let me just, the notion perhaps  
24 that Pattie went up and down, which isn't in his  
25 memoirs, and the notion that Sykes maybe started at

1 Safford, which every piece of evidence that we've  
2 actually had our hands on says he started in Phoenix.

3 A. Yeah, and if I could touch on Pattie, and  
4 actually, in the attachment to my report, I have those  
5 sections of Pattie where he was on the Gila. I don't  
6 know how Goode P. Davis, because it's inconsistent with  
7 the book that was later edited based on his thesis, I  
8 should argue. That book, the book that a lot of people  
9 can buy on Amazon or see in the library is not his  
10 thesis book, but was a book that was based on his thesis  
11 that was edited, I believe, by a guy named Turner, who  
12 those of us that are in the business kind of know that  
13 Turner was an active guy.

14 When you look -- and that was entered into  
15 evidence by the State Land Department, Goode P. Davis's  
16 book. What was not entered into evidence, at least  
17 unless it was earlier -- and if so, I'm mistaken, but I  
18 don't think his thesis has ever been entered into  
19 evidence. What got entered into evidence was the book  
20 that was based on his thesis that was entered by the  
21 State Land Department.

22 When I read that, and then I didn't get the  
23 impression based on Goode P. Davis's book, not his  
24 thesis, that there's any question about whether he went  
25 up and down from Safford to Yuma. There's nothing in

1 Goode P. Davis's book that would even suggest that. But  
2 as I was joking with Dr. Littlefield before he left  
3 yesterday -- who is truly a trained historian, and I am  
4 a hydrologist that is a student of history -- he looked  
5 at me and he said, Mr. Burtell, Rich, he said, always go  
6 back to the primary source if you can, if you've got the  
7 time, because, hey, we all have nuances and biases in  
8 how we read other people's accounts and summarize that.

9           So I did. And I think if there's one account  
10 that we all know was pretty darned important if we're  
11 students of river use in Arizona, it's Pattie. So I did  
12 go back, and you'll see his accounts are in my  
13 attachment, and I'll leave it to the Commission. I know  
14 you guys don't have a lot of time, but you're not going  
15 to take my word for it. I simply don't see anything in  
16 his own words, in his memoir, where he says that he --  
17 and I'm trying to remember Mr. Fuller's words in his  
18 PowerPoint, not consistently, but it almost sounded  
19 routinely that he went up and down the Gila River in a  
20 boat, in a canoe from Safford to Yuma. I just don't  
21 know where that is.

22           The areas where I saw that it was clear that  
23 he was in a canoe was below the Salt. And in that area,  
24 from what I read in his account, he was going back and  
25 forth -- using a boat, a canoe almost in a ferrying

1 capacity. And if you read his words, he says that,  
2 understandably, one of his colleagues was on a horse and  
3 almost drowned in the river. So to avoid that, and also  
4 to avoid leaving his scent on the banks, he would use  
5 his dugout canoe, and he talks about, I believe, you  
6 know, using cottonwoods to make a dugout canoe.  
7 Certainly not the type of canoe that those of us that  
8 grew up back east think about when we were in history  
9 class with Native Americans back east. It wasn't that  
10 type of canoe. It was dug out, and I suspect -- I don't  
11 know exactly how they build them, but you chop down a  
12 cottonwood and you either burn it out, burn out the  
13 middle of it, or use your axe to chop it out or a little  
14 bit of both. But he claims about using those dugout  
15 canoes to go back and forth as he's trapping his way  
16 down.

17           The account in Barbara Tellman's book -- and I  
18 actually brought it here, the Arizona Changing Rivers  
19 that Mr. Fuller talked about. I went to it, and I  
20 looked at the -- I went to where she talks about the  
21 Gila River, and Ms. Tellman -- and unfortunately, she's  
22 not here to explain what she did. But the account of  
23 the eight canoes that a lot of people have talked about,  
24 when you look at his original memoirs, there's, there's  
25 not a shred of question about where he is. They've

1 reached --

2 Q. He's on the Colorado River?

3 A. They've reached the mouth of the Gila.  
4 They're in good spirits. They have a banner time with  
5 getting beaver on that lower stretch. They're in good  
6 spirits. The river tribes at that time, there was  
7 perhaps as much unrest as Joe's clients along portions  
8 of the Colorado River. A lot of the trappers and  
9 settlers had to deal with those Indians, either in  
10 crossing the river. Certainly later people that crossed  
11 the river had the Indians help them cross. They got  
12 their horses stolen. So they didn't have any choice.  
13 And so the whole account about building the eight dugout  
14 canoes, that -- and again, I'll let you read Pattie's  
15 accounts.

16 Q. It's in the, the memoirs are in the record.

17 A. The memoir, the full memoirs are in the  
18 record. And what's in my attachment ends with the Gila,  
19 and actually is focused on the upper. My focus wasn't  
20 the middle or the lower. But I did read, you know, out  
21 of just personal interest, if nothing more, the eight  
22 canoes are on the Colorado, and I don't think anyone is  
23 questioning the potential navigability of the Colorado  
24 River.

25 So, unfortunately, Ms. Tellman's book, the

1 Arizona Changing Rivers, in her chapter where she talks  
2 about the Gila River, she has the quote about the eight  
3 canoes, which is the Colorado River. So just something  
4 for future reference that it's unfortunate because I  
5 think people perhaps have latched on to this concept of,  
6 well, gosh, it's the Gila River, eight canoes. No, it's  
7 the Colorado River. So I thought --

8 Q. Let me turn you quickly, the other one that  
9 does not appear in your table that Mr. Fuller referred  
10 to was the Sykes trips; and have you seen any evidence  
11 to suggest those Sykes trips included any portion of the  
12 upper Gila River?

13 A. No. And the account that I think is best is  
14 the newspaper article that was written later in his life  
15 when he was recounting what he did when he was younger,  
16 and from everything I've read -- and I think Mr. Fuller  
17 discussed this on both direct and cross-examination --  
18 there doesn't seem to be a lot of evidence that Sykes  
19 did any -- I don't want to say anything more than, but  
20 he started -- I'm trying to remember if he did the Verde  
21 down to Phoenix, but certainly the Phoenix area down  
22 from a Gila perspective. Maybe it was somebody else  
23 that went from the Verde all the, tried to go all the  
24 way down to Yuma.

25 But there is no evidence that I found that

1 Sykes actually was above the Phoenix area that I could  
2 find.

3 But again, I'm the first to admit, and those  
4 of us that look at newspaper and historic accounts,  
5 you're always surprised when you find something new, and  
6 sometimes you do, and for those of us that do it, it's  
7 kind of exciting. I mean, I know you guys think we need  
8 to get lives. But it does bring a smile, and I think  
9 even my strongest opponents in this room will agree that  
10 when you stumble onto something that you haven't seen  
11 before when you've studied something as long, you're  
12 like, wow, this is kind of interesting. This is new.

13 And I wish I could say I'm good enough to make  
14 this a good segue, but we do have a segue, I think, into  
15 -- if Mr. Hood is going to ask me about something I did  
16 stumble onto very recently. And I will apologize to the  
17 Commission, and particularly the State Land Department  
18 who was very unhappy, I think, with me, in Santa Cruz  
19 about entering evidence at the last minute, and I  
20 apologize.

21 Q. Well, we did get this in, though. This is an  
22 excerpt of Chapter 9, Gila Trail. This was put in a  
23 week or two ago.

24 A. It's late though. And I understand, everyone,  
25 and I apologize. It's difficult. Mr. Fuller, Gookin,

1 Mr. Mussetter -- Dr. Mussetter, we all hate it. We're  
2 technical people. We wanted time to study this stuff.  
3 I understand. But we've got it in the evidence. I  
4 apologize that it was late.

5 I think it's interesting because in light,  
6 particularly in light of all the discussion I've heard  
7 this week about successful attempts or failed attempts,  
8 I think this is one that I think the group will agree  
9 was a failed attempt that no one has ever talked about  
10 before. It's in my area. And so with that as a big  
11 lead-in, I would like to turn -- and Sean, I don't know  
12 what exhibit number this is.

13 Q. It's Freeport 7 on our index.

14 A. And my client would be happy to know I haven't  
15 ordered this book yet because I ran out of time. But I  
16 was able, fortunately, to get screen shots on Google  
17 about the sections of this book that had the sections of  
18 the account.

19 And so if I turn people's attention to this,  
20 believe it or not, we got another Forty-Niner that for  
21 some reason I had not seen. And Mr. Fuller, I would, I  
22 would, if you're not aware -- if this has already been  
23 entered into the record, I didn't see it. And if it  
24 already is, I'll apologize once again. But there is a  
25 fellow named Stanislas LaSalle who went down the river.

1 He was a Forty-Niner. And so he went through the area  
2 pretty early on. Apache unrest, I think you could  
3 argue, was alive and well at that time. There wasn't  
4 any Anglo irrigation going down. And he and his group  
5 of Forty-Niners, and there was at least 30 of them, I  
6 understand, based on this account.

7 Stanislas LaSalle went down -- it's one of the  
8 best accounts I think I've read, and I've become a  
9 student of several of these. He talks about in July,  
10 and I turn you folks, and I'll apologize again about the  
11 screen shots. It's not a very professional way of doing  
12 it, but I just ran out of time. If you could turn to,  
13 and he has a daily synopsis as most of these guys did  
14 back then.

15 If you could turn to July 11th. So he is  
16 following the same trail that Emory did a few years  
17 earlier in 1846, going down the portion of the so-called  
18 Gila Trail that not as many people went down. A lot of  
19 people went south. But he marched right through my  
20 study area. So you can imagine my eyes are big as  
21 saucers when I ran across this. Here is another guy.  
22 How did I -- how did we all miss this or how did I miss  
23 it?

24 Well, where he is at the time on July 10th is,  
25 those folks that know the Safford area, he's around

1 Mount Turnbull. And if you look at the last sentence or  
2 so of his July 11th account, he's at Mount Turnbull,  
3 which is around the Calva area. And I brought, if  
4 anyone is interested, a map. It's in my bag, actually.  
5 It's a topo map or gazeteer that shows where the Mount  
6 Turnbull area is. And I'm sure Mr. Sparks could put it  
7 more precisely on a map than me. But he's in Segment,  
8 what I call Segment C or Mr. Fuller's Segment 3.

9           And what he does, he's talking about being  
10 there. The next day something really bad happened. One  
11 of the party got shot in the leg accidentally. And  
12 that's described in the July 12th description.  
13 Accidents do happen. It's a tough time.

14 Unfortunately -- or fortunately, they did have a doctor  
15 in their group, but the doctor was not able to get the  
16 bullet out.

17           So we're talking real world stuff now. This  
18 is a bad, bad situation for everyone involved. You got  
19 a member of your party. He's got a bullet in his leg.  
20 Can't get the bullet out. So what did they do? Well,  
21 if you start with -- so July 12th describes him getting  
22 shot in the leg and not being able to get the bullet  
23 out.

24           So what they decide that they're going to do,  
25 and if I can, I'll read the account. "Today we traveled

1 about a mile from camp, but David C. Buchanan, meeting a  
2 serious accident, we returned to where we had camp.  
3 While Buchanan was riding by the side of" -- and it says  
4 name omitted by author -- "White's rifle went off and  
5 struck Buchanan in the thigh, entering some six inches.  
6 Dr. Bush tried to extract the bullet, but it having  
7 glanced, he could not succeed. Several plans were  
8 suggested to carry Buchanan on. The plan adopted was to  
9 send some 30 men on this evening nine miles down the  
10 river." Not knowing exactly where they are, I think --  
11 I know that they were in Segment 3 where the accident  
12 occurred because that's where Mount Turnbull is. But  
13 what I don't know is exactly where they are. If that  
14 nine miles would have, if they still would have been --  
15 I believe they were still in Segment 3 and still above  
16 Coolidge Dam. That would be my guess. But I'll  
17 continue. Sorry for all the side commentary. I'll let  
18 you guys read into it what you want.

19 "The plan adopted was to send some 30 men..."  
20 so we know at least there were 30 people on this trip.  
21 How many more, I don't know. "...on this evening nine  
22 miles down the river and make canoes, there being no  
23 timber here suited for the purpose. Joe Dale shot a  
24 mule last night by punching. When we returned with  
25 Buchanan to camp, we found several Indians who ran on

1 our approach."

2 So Joe's clients were in the area, but they  
3 were not attacked by Joe's clients -- maybe not at that  
4 time.

5 July 13th, this is kind of where I think I'll  
6 make my point. I know you guys want me to get to it.  
7 "Traveled 15 miles. Built a raft." Now, for some  
8 reason they didn't build a canoe. They said originally  
9 they were going to build a canoe but then they ended up  
10 building a raft, so don't know why. But "They built a  
11 raft for Buchanan, but it was not practicable. The  
12 river was too low and too many rapids. About dark, a  
13 party went up the river to meet the raft. They found  
14 the raft three miles up the river. They came in camp at  
15 10:00 at night. They brought Buchanan on the litter,  
16 nine miles to where timber could be had. He was carried  
17 by men."

18 So they weren't able to use the boat. I  
19 think, I hope that everyone here would agree that this  
20 might be considered, at least for the purposes of what  
21 was done, a failed attempt to get an injured man out  
22 using a boat on the river.

23 Q. A very low draft boat, at that.

24 A. It was a raft. And I think we definitely had  
25 a need. They were on their way, obviously, they're a

1 Forty-Niner; they're on their way to California.

2 But I think this -- and believe me, everyone,  
3 I fully understand this cherry-picking, just throw an  
4 account of boating and say the whole decision on  
5 navigability is going to turn on one decision is lunacy.  
6 I get it. Believe me, I get it, or I wouldn't have  
7 prepared that Table 1 where I put all the historic  
8 accounts in.

9 This is, I think, a process of multiple lines  
10 of evidence and in getting the full breadth of what was  
11 happening out here.

12 I simply throw this on the list or throw this  
13 on the pile as to something I hadn't seen before that  
14 people should maybe take into consideration when they  
15 consider the navigability of the river. Nothing more  
16 than that, so --

17 Q. Mr. Burtell, I had a couple more things that I  
18 wanted to talk about, but I do want to end this direct  
19 presentation before lunch, so I think if --

20 A. I will be a little quicker if I'm rambling.

21 Q. Well, or if you -- my last couple points  
22 actually aren't essential. If you have anything you'd  
23 like to say in closing, I'm prepared to pass the buck.

24 A. If it's okay with everyone, I wouldn't mind,  
25 if it means maybe we start just a little, maybe wrap up

1 my direct now, if that's possible.

2 Q. Uh-huh.

3 A. Yeah, I think maybe that would be great for  
4 everyone. Start the afternoon and start where the real  
5 fun begins.

6 Q. I agree with that. So at this point, we've  
7 gone through basically your declaration. I mean, there  
8 were a lot of factual things discussed this week. I had  
9 a couple of them to go over but they're not really  
10 essential. Is there anything else you want to discuss  
11 on direct?

12 A. Do we want to talk anymore about boating?

13 Q. Sure. Yeah. You've got ten minutes.

14 A. Okay.

15 MR. HOOD: If that's okay with the Commission?

16 CHAIRMAN NOBLE: Certainly.

17 MR. HOOD: Okay.

18 THE WITNESS: Okay.

19 CHAIRMAN NOBLE: As long as it's okay with  
20 Mr. Hill.

21 THE WITNESS: And I'll just say, I took no  
22 offense to, if there was any offense. Or maybe I'm too  
23 stupid to understand I should have taken offense to any  
24 discussion earlier in the week about my conversations  
25 with Mr. Colby. I kept thinking why, gosh, why would

1 anyone think I was offended by it. I certainly want to  
2 know what somebody said to somebody. Hopefully, you  
3 folks will take what I say at face value, but you don't  
4 have to.

5 I was drawn to Mr. Colby being a, I think,  
6 part owner of Cimarron Commercial Boating Company who  
7 conducts or had conducted trips through the Gila Box.  
8 And what I -- when I was reading the previous testimony  
9 and previous counsel briefs, it seemed that that was  
10 among other lines of evidence that the State parties had  
11 entered as an indication that the river was used in a  
12 commercial manner.

13 So I thought to myself, well, see if I can, as  
14 with Mr. Lingenfelter -- Dr. Lingenfelter, reach out and  
15 see if Mr. Colby is still around. Clearly, and I hope  
16 everyone understands, I wasn't going to get into a  
17 discussion with him about navigability. It's a legal  
18 issue. It's something that I'm sure the Commission in  
19 light of all this new evidence and PPL Montana and  
20 Winkleman are all struggling with exactly how do you  
21 define it and apply it.

22 But I wanted to know whether this previous use  
23 of the river by outfitters had continued. And so I  
24 asked, and I've got my notes here. I literally, if  
25 people want to come up and look at my notes, I don't

1 mind. I mean, I simply asked Mr. Colby who previously  
2 offered commercial trips through Gila Box whether he  
3 still does it and whether he knew of anyone who does, if  
4 he didn't. And he said -- and I'm paraphrasing, and if  
5 he disagrees with me, then I guess I don't want to say  
6 it's his word versus mine. But as I recall what he said  
7 is that he had not -- he had not done any commercial --  
8 he no longer offered commercial trips, and he was not  
9 aware of anyone that was. And then he added that it  
10 wasn't, it wasn't viable, that, I guess that -- and I'm  
11 trying to remember his exact words. But there wasn't a  
12 lot of consistency enough in the flow that it was  
13 something from a commercial basis that he could rely on  
14 to even make it viable for him to offer these trips.

15 So I took that at face value. And then about,  
16 I guess ten days or so before the hearing when I first  
17 saw Mr. Fuller's PowerPoints, I saw that Mr. Fuller said  
18 that Mr. Colby just recently stopped leading  
19 commercial -- I think that's the word in his PowerPoint,  
20 was "recently." He no longer recently -- recently he  
21 stopped leading trips through.

22 So that, that was interesting to me. I went  
23 on a website that he advertises on, and there was no  
24 indication that --

25 Q. That who advertises on?

1           A.       Oh, I'm sorry, Mr. Colby. I apologize.  
2 Trying to get a sense of, well, how recently did he stop  
3 offering trips going down Gila Box. And the last time I  
4 saw -- I saw something back to '08, and it wasn't  
5 anything advertised about offering trips down Gila Box  
6 commercially at that time.

7                   And then it dawned on me, because I had  
8 previously called the Gila Box people wanting to find  
9 out and verify that there were no commercial outfitters  
10 to shuttle people back and forth. And I remember them  
11 telling me, but way in the recesses of my brain, that  
12 you need permits. And I was like, okay, so you get  
13 these five-year permits to be able to float down the  
14 river, and I think it's similar to a lot of the rivers.  
15 You get a permit. It's no obligation that you use it,  
16 but you have the right to, and I'm sure Mr. Fuller can  
17 tell me a lot more about boating permits.

18                   So it got me thinking, well, hey, maybe this  
19 will help clear up this issue about how most recently  
20 Mr. Colby and Cimarron has led trips down Gila Box.  
21 Well, I called and I talked to the manager of Gila Box  
22 National Riparian and Recreation Area -- or did I get  
23 that right? Riparian National Conservation Area. And  
24 his name is Tom Schnell, and I talked to him last week,  
25 because it was a few days after I got Mr. Fuller's

1 PowerPoint, and he told me that there had not been any  
2 trips down Gila Box on a commercial basis for the last  
3 15 years.

4 Q. No permits, anyway?

5 A. No. No.

6 Q. Okay.

7 A. He said there had been no trips. Now, of  
8 course, he knows about all this stuff because he is the  
9 manager of the recreation area.

10 And then to further my interest in all this,  
11 when I saw the morning of, then the presentation by  
12 Mr. Fuller, he had added a new slide that I had not  
13 seen -- unless I missed it -- that actually listed all  
14 the boating companies that previously -- I swear that  
15 wasn't in the one ten days ago, but maybe I missed it,  
16 that listed all the different boating companies that I  
17 guess had previously had permits.

18 And so I think what's more relevant perhaps to  
19 the Commission is in the last 15 years, at least in the  
20 mind of the manager of Gila Box, there hadn't been any  
21 commercial trips down that river.

22 And I know what I'm going to get asked next  
23 upon cross-examination, so I'm sure I'll be asked a lot  
24 of other things. So then I said to myself, well, I've  
25 lived here since '97, and I know we're in a world

1 class -- we're in a, we're in a pretty good drought.

2 So maybe the simple explanation is there has  
3 been no boating for the last 15 years because we're in a  
4 drought. Reasonable thing to assume. So what I did is,  
5 I then -- and this is entered into evidence -- and Sean,  
6 I don't know, Mr. Hood, I don't know what this is.

7 Q. This is Freeport 4 on our index.

8 A. And so I turn the Commission's attention, if  
9 you will, and what I did is I plotted the actual March  
10 and April mean flow, mean monthly flow in March and  
11 April at both the Clifton Gage and the Safford gage.

12 Now, as we've heard during this week, the  
13 Clifton Gage is just at the upside of Gila Box, above  
14 where the San Francisco comes in, which contributes a  
15 lot of water. And then the Safford gage is just at the  
16 head of Safford Valley, below Bonita Creek coming in,  
17 and it measures then the combined flow of Eagle, Bonita,  
18 and San Francisco.

19 And what struck me when I looked at these --  
20 and I would ask the Commission -- I don't have all of  
21 the answers, but what I found was interesting about this  
22 was indeed since maybe '98 or '99, it's been pretty dry,  
23 and these average monthly flows for March and April are  
24 low.

25 But what also struck me is that there's some,

1 during the period of '98 through 2014, there has also  
2 been some times when the flow got pretty good. And I  
3 say pretty good. That is similar to the type of flows  
4 when Cimarron was actually on the river doing their  
5 thing.

6 So it made me kind of wonder, well, wait a  
7 minute, if it's just because we're in a drought and  
8 we're getting now some flows that are similar to the  
9 flows that were occurring when there was boating, maybe  
10 there's something more here. I don't know. Maybe it's  
11 not just the drought to explain why there's not any more  
12 commercial boating, at least through the last 15 years.

13 And then the other thing I did is I said,  
14 well, is there something unusual about the time when  
15 they were boating in the '80s and '90s. And that is  
16 interesting, I think. And I'll let the Commission dwell  
17 on this.

18 If the Commission takes a look, and maybe look  
19 at the Solomon gage, and take a look at March, although  
20 you can look at April, too. March and April, again,  
21 according to Tom Schnell, the manager, is when most of  
22 the boating activity commercially occurs. Take a look  
23 at some of those whopper flows. I say whopper; that's  
24 not a very scientific term. Take a look at just how  
25 high the mean March flows were in the '80s and '90s

1 during some of those years. These were some pretty good  
2 numbers. I think I would have enjoyed being on a trip  
3 with Mr. Fuller going down some of these flows. And  
4 that seems to be a period when commercial activity was  
5 cooking along.

6 Q. So that was a particularly wet period when  
7 there were these commercial outfitters operating in the  
8 Gila Box?

9 A. I certainly think the argument could be made.  
10 Mr. Fuller and others, we all love making arguments and  
11 try to hypothesize about why. But I certainly think  
12 people should consider that maybe the years when there  
13 was commercial boating was wet. And maybe since that  
14 time it's not been so wet.

15 But I also draw the Commission's attention to  
16 the period before 1980. Look at all those -- this is  
17 mean monthly flow at the Solomon Gage below Bonita  
18 Creek. Take a look at all those low flows -- or let me  
19 rephrase that. Look at how low all those flows are.  
20 That was a pretty long period when flows were quite low.  
21 It almost made me start to think that -- and Mr. Hood is  
22 not putting words in my mouth. I can put them in there  
23 myself. That it does make you ask the question of  
24 whether the '80s or '90 were unusually wet.

25 I was in graduate school at the U of A in the

1 late '80s. I'm dating myself now. And it was pretty  
2 darn wet there, but I hadn't lived here to know what wet  
3 or dry was by then.

4 But I think the argument could be made that  
5 the '80s and '90s were on the wet side. And maybe that  
6 at least partially explains why commercial boat traffic  
7 through the Gila Box was occurring then but hasn't  
8 occurred since; and I don't have evidence it occurred  
9 before.

10 Q. We're over our time. I beg one minute from  
11 the Chairman. Just, Mr. Burtell, can you bring this  
12 around with respect to modern day recreational boating  
13 on other nonnavigable streams, just to tie it up, and  
14 then it's time to break.

15 A. Sure. I think it's -- believe me, this has  
16 been a very interesting week for me as I'm sure it is  
17 for all the witnesses, and it will be much more  
18 interesting for me this afternoon.

19 But I must admit that the most interesting  
20 thing I've heard in this whole ANSAC proceedings, and  
21 this is my third go-around now, at least in terms of  
22 rivers in this latest remand case. I have never, even  
23 as surprised perhaps that I have been by  
24 Mr. Hjalmarson's contention that one foot was all you  
25 needed for proof of navigability in the Santa Cruz

1 case -- or the San Pedro case. He didn't testify in the  
2 Santa Cruz. Mr. Fuller's notion that we now come down  
3 to six inches, it makes me just wonder, wow, how many  
4 streams in the West that have either been evaluated from  
5 a navigability perspective previously or will be in the  
6 future are going to be hanging their hat on six inches?  
7 And if they are, it does lead to some interesting next  
8 steps for the Commission. And I'm not, I'm not a  
9 lawyer. I don't know, you know, what precedent is or  
10 isn't.

11 But it certainly begs the question, if we come  
12 down to six inches, I think some other rivers in Arizona  
13 come into play that we're not even talking about here on  
14 remand, which by itself I think is kind of a curious  
15 thing.

16 And then it certainly makes us start looking  
17 at some other rivers in other states and say to  
18 ourselves, hmm, we're all supposed to be following  
19 Daniel Ball with some nuanced changes from PPL Montana,  
20 at least for this case, and Winkleman; boy, State of New  
21 Mexico, the Rio Grande River, as I understand in its  
22 entirety, is nonnavigable.

23 Q. Within the state.

24 A. Within the state. I won't speak to Colorado  
25 or I believe it flows into Texas.

1 Boy, there's a lot of evidence that you can  
2 put a boat into six inches of water along, either  
3 historically or now, along lots of portions of the Pecos  
4 or --

5 Q. There's lots of modern day recreational  
6 boating occurring on the Rio Grande.

7 A. On the Rio Grande. And let's bring up the  
8 bugaboo San Juan. I mean, I'm a big fan of the  
9 Canyonlands area. I have done a lot of canoeing down  
10 Canyonlands National Park. I think I said that in the  
11 Santa Cruz case.

12 Quickly, I would say that on my trip to Moab,  
13 I cross over the San Juan, and the little town of  
14 Mexican Hat is a common starting point for put-ins for  
15 people that are floating the San Juan. And boy, there  
16 are a lot of folks that are floating the San Juan,  
17 either on a personal basis or commercially, and that's a  
18 river that's been deemed nonnavigable.

19 Q. It is not a highway for commerce.

20 A. I think it's convenient for maybe the State  
21 to -- I don't want to say forget about the highway and  
22 the commerce part of it, but I can't escape that.

23 And I think when you get down to six inches,  
24 you're almost throwing the concept of a highway,  
25 something that can be used routinely and regularly, let

1 alone as an artery of commerce, it just, it almost gets  
2 things thrown out the window. And I'm not going to  
3 decide if their interpretation -- it just, it just  
4 doesn't make a lot of sense to me. And I'll let others  
5 decide if my opinion is right or their opinion is right.

6 MR. HOOD: That's all I have for Mr. Burtell.

7 CHAIRMAN NOBLE: Thank you, Mr. Hood.

8 Mr. Burtell, you get to stay there, but I'm  
9 not sure who is going to go next.

10 We will now take lunch until 1:30.

11 (Recessed from 12:05 p.m. to 1:30 p.m.)

12 CHAIRMAN NOBLE: Mr. Katz.

13 MR. KATZ: Thank you very much. And I'm going  
14 to get started and do the initial portion of the  
15 cross-examination. Then my technical expert, Joy  
16 Hernbrode, is going to finish up. I probably won't take  
17 a second bite at the apple.

18

19 CROSS-EXAMINATION

20 BY MR. KATZ:

21 Q. Good afternoon, Mr. Burtell.

22 A. Good afternoon, Mr. Katz.

23 Q. And I don't think you're going to find this to  
24 be too unpleasant. Our primary focus is going to be on  
25 just making sure we understand the essence of your

1 presentation and not argue hydrology, because I'm not a  
2 hydrologist or geomorphologist, and try to argue those  
3 points with you. I just want to make sure I understand  
4 where we're coming from.

5 A. Okay.

6 Q. And if you don't understand one of my  
7 questions, because sometimes I throw a bunch of  
8 questions into one, please ask me to rephrase it or make  
9 sure you understand it.

10 And I would ask you -- we don't have formal  
11 rules of evidence in these proceedings. I would never  
12 suggest that you answer my questions yes or no. Answer  
13 them completely, but I would ask you to answer only the  
14 question I've asked you. But if you think that things  
15 are left up in the air, your attorneys will have an  
16 opportunity to clarify anything that I mess up. Okay?

17 A. And I will, to the degree I can, try not to be  
18 evasive, which I know you don't like that either, so --

19 Q. I understand. And I'll again try to  
20 communicate well with you, and I know you'll try to do  
21 the same with me. But thank you.

22 A. Okay.

23 Q. When do you believe that the Gila was last in  
24 its ordinary and natural condition?

25 A. When you ask that question, which portion of

1 the Gila are you referring to?

2 Q. Let's just focus in on the upper Gila Segments  
3 1 through 3, because that was the essence of your  
4 report, correct?

5 A. It was. I would say based on my understanding  
6 of Winkleman and what they constitute as ordinary and  
7 natural conditions, that prior to, I would say, sometime  
8 in the 1880s is when there was the beginning of enough  
9 diversions for agriculture that there could have been a  
10 noticeable decrease in flow along the Gila River.

11 Q. And again, when we're talking there, we're  
12 talking pretty much natural, that means not substantial  
13 interference by man, correct?

14 A. That's correct.

15 Q. So you believe that the natural condition, at  
16 least, became obviously altered around 1880 or  
17 thereabouts?

18 A. Yes. And there is a table in my report that  
19 in that respect, I think, is quite helpful where I  
20 summarize the acreage of that agriculture historically.  
21 I think I start in 1872 or so and then march my way  
22 through 1904. And I try to capture acreages in the  
23 various portions, either along the Gila or its  
24 tributaries and give you and the Commission a sense of  
25 just what irrigated acreage there was and by implication

1 the diversions that go with it.

2 Q. And we were talking about diversions changing  
3 what would be the natural flow or course of the river,  
4 correct?

5 A. That is correct, yes.

6 Q. You would agree with what others have stated  
7 and what the case law suggests that floods and droughts  
8 are part of the ordinary and natural condition. Well,  
9 do you believe that floods and droughts are part of the  
10 ordinary and natural condition of the Gila River or are  
11 not?

12 A. Mr. Katz, and again, I'll try my best.  
13 Sometimes I need to pause. I'm concentrating, so please  
14 don't --

15 Q. Sure, take your time.

16 A. My reading of the Winkleman decision in where  
17 they, as I recall, parenthetically defined what natural  
18 and ordinary was. As I understand ordinary -- and I  
19 know I'm paraphrasing -- was absent drought and floods.  
20 And the way I interpreted that -- and I think I've  
21 interpreted it similar to most -- is that if you're  
22 looking at the amount of flow in the river, if you're in  
23 the middle of a flood event or if you're in the middle  
24 of an extended drought, that one should not focus on  
25 that day or that couple days or week or whatever as an

1 indication of whether or not the river could have been  
2 navigated in that condition.

3           So let's use a flood as an example. Peak  
4 flood goes through, and certainly at the time that that  
5 flood is going through, maybe proponents of navigability  
6 would say, hey, you could put a boat on that river at  
7 that time. I would argue, and I think Winkleman is  
8 saying, hey, do not under those circumstances make your  
9 determination. So that's how I viewed the two.

10           Now, as a caveat to that though, the effect of  
11 a flood afterwards on the river is a kind of a different  
12 question though, and maybe that's not what you're asking  
13 me, so --

14           Q.     I'm talking right now initially about the  
15 flows.

16           A.     Okay, all right. Thank you. So we're on the  
17 same page. Got you.

18           Q.     But you have taken the position that the  
19 condition after the flood is the result of a natural  
20 occurrence; and we can debate whether or not that  
21 represents the river channel in its natural condition,  
22 but it's the position you have that that's the result of  
23 an act of nature, a flood?

24           A.     That is correct. The braiding that I think  
25 all the experts have testified to and have written

1 about, in my opinion at least, that event and the  
2 subsequent effect that it had on the channel, that event  
3 of flooding, in my opinion, was a natural event.

4 Q. Okay. And would you agree that, or I think  
5 you've already testified that from at least 1800 to  
6 approximately the 1880s, or was it later than that, that  
7 the river while it occasionally ended up in a braided  
8 condition post-flood was, by and large, the flow  
9 channel, a single channel throughout most of that time  
10 frame?

11 A. I mean, I apologize. I know you're the one  
12 asking the questions. I just want to make sure we're  
13 talking about the same thing.

14 When you ask me -- maybe from here and here on  
15 out, Mr. Katz -- are you asking me for the Gila in its  
16 entirety or just the three segments I focused on? I  
17 just don't want to misstate one or --

18 Q. And again, your focus in your report was on  
19 the upper Gila, even though you had knowledge or some  
20 knowledge of the entire river system, correct?

21 A. Okay. So maybe for the Commission's benefit  
22 and everyone here, I'll just assume then for the  
23 questions that you'll ask me that unless you say,  
24 Mr. Burtell, I'm talking about the whole Gila, we'll  
25 just agree then that these questions you're posing to me

1 are just specific to Segments -- my A, B, and C.

2 Q. A, B, and C or our 1, 2, and 3, even if we're  
3 a few miles off one direction or the other.

4 A. Fair enough. So in response to your question  
5 then about the conditions of the Gila River that I  
6 studied prior to -- or from you said I think 1800  
7 through the 1880s, all of the accounts and analyses I've  
8 looked at indicated that it was a single meandering  
9 channel.

10 Q. Just bear with me a second.

11 A. Sure.

12 Q. Let me just ask so that we're all on the same  
13 page. From a hydrological perspective, your knowledge  
14 and education, you use the term flood. We all have.  
15 But how would you define a flood that would be an  
16 extraordinary or not ordinary event on a river?

17 A. Hmm. Wow, that's a -- as a hydrologist, that  
18 is a -- as those of us hydrologists that look at flow  
19 data, there's lots of different sizes of floods. And so  
20 as people in the profession usually look at return  
21 periods, and that is a flood, a flow event of a certain  
22 magnitude and how frequently it might occur in any given  
23 year -- I don't mean to be, and this will probably be  
24 the first of many times I say this; I don't mean to be  
25 evasive. But there's so many different ways of

1 characterizing what a flood is.

2 For example, every year there is going to be a  
3 highest flow event that the USGS, for example, will say  
4 that that was the flood event for that year that might  
5 be substantially lower than another year.

6 Q. And I guess --

7 A. So I'm struggling a little bit.

8 Q. And I don't mean to be rude or in any way  
9 interrupt you.

10 A. No.

11 Q. I don't mean to interrupt you, but not to be  
12 rude, and the real issue --

13 A. Okay.

14 Q. -- I'm maybe struggling with or asking you to  
15 help me understand is where we draw a distinction  
16 between what would be a median or even mean expected  
17 high flow and low flow in a river, or maybe I won't use  
18 the term "median." But where do we draw the line  
19 between high flow that would be ordinary and a flood  
20 condition that might be deemed to be extraordinary? And  
21 I know there might not be an arithmetic or mathematical  
22 definition. I'm just trying to get a sense as to what  
23 your perceptions are on this issue.

24 A. As we all know, and we've heard testimony, and  
25 I think most Arizona rivers would fall into this

1 category because of the effect that any flood event  
2 could have on the flows and, more importantly, the  
3 calculation of average or median flows thereafter.  
4 Median flows are useful, particularly in Arizona, to try  
5 to minimize the undue effect that those high flow events  
6 would have on capturing what is a more typical, maybe a  
7 different word of saying median type of flow event. I'm  
8 still thinking I might not be answering your question  
9 though.

10 Q. Well, I'm not going to try to beat that to  
11 death.

12 A. Okay.

13 Q. I mean, normal or ordinary high water or low  
14 flow isn't going to cause the sudden destructive changes  
15 that a flood would, correct?

16 A. Okay. I think now you and I might be getting  
17 closer to being on the same page. Certainly what a lot  
18 of people and those of us that do 404 permitting, we've  
19 heard the phrase ordinary high water mark. And I think  
20 Mr. Fuller did a very fair job of describing how one  
21 might identify an ordinary high water mark in the field.

22 My understanding, and I've seen different  
23 estimates, but usually a flow event that has -- and this  
24 gets a little statistical -- but has a return period of  
25 maybe one to two years is the amount of flow that

1 maintains that ordinary high water mark. And then how  
2 then, you might say, well, do you figure out the one or  
3 two-year return period.

4 Well, you take all of the annual flow events  
5 and you plot them up -- and I won't bore everyone -- and  
6 you use that then to determine what might be the return  
7 period.

8 And the Corps of Engineers, that's what I  
9 recall them using is roughly between one to two-year  
10 return period maintains an ordinary high water mark.

11 Q. And I think you would agree based upon your  
12 experience that certain rivers that have been declared  
13 navigable may have occasional periods of time for a week  
14 or a month that they might also be dry, correct, or  
15 frozen?

16 A. Frozen, I would agree with you on. And I'm  
17 not a student of all the cases; I'm sure you and Joy  
18 are. I know Alaska you could say that for. I'm not  
19 sure -- and you're probably going to tell me one -- of a  
20 stream that was deemed navigable that under natural and  
21 ordinary conditions, that is absent diversions,  
22 et cetera, goes dry. But maybe you can tell me one. I  
23 don't --

24 Q. And I'm not going to argue with you. But have  
25 you read any of the provisions in the case law that talk

1 about the fact that an occasional rare event -- well,  
2 I'm going to strike that.

3 A. Okay.

4 Q. How would you define drought versus low flow?  
5 And again, I know there isn't a precise measure between  
6 the two.

7 A. Yeah. It's -- drought can -- it's not done as  
8 frequently as flood analysis because flood analysis you  
9 usually do because you're trying to engineer a structure  
10 that you're not trying to lose. But people look at the  
11 recurrence of drought events. You can do that in a way  
12 similar to flood events. So then it comes down to a  
13 question of the severity of the drought. And that's  
14 when it gets kind of tough to say, well, is it a really  
15 big drought or not? You almost have to analyze a  
16 particular area and look at the history of that area.  
17 And similar to floods, you look at all of the years  
18 where you've had high or low flows, and then you analyze  
19 those, and then you come up with essentially a return  
20 period for a drought.

21 I have heard people say more recently, you  
22 know, that this drought, you know, does it or doesn't it  
23 rank up to the drought of the 1950s, for example. So  
24 it's kind of a similar analysis to that.

25 Q. But again, absent a condition of drought,

1 which you agree would be not ordinary, at least within  
2 that definition of the case law, an ordinary condition.  
3 There are states like Arizona that have seasons with  
4 higher natural or ordinary precipitation and lower which  
5 affects stream flow, correct?

6 A. Indeed.

7 Q. And lastly, we've had some debate in these  
8 proceedings about channel.

9 A. Yes, we have.

10 Q. How do you define channel, and if there are  
11 different types of channel; I'm not asking braided  
12 versus meandering, but how do we define channel? Or  
13 what is your understanding -- you heard Mr. Fuller talk  
14 about the floodplain or the flood channel, and then he  
15 was talking about low flow channel. When you used that  
16 term in your testimony earlier or in your report, how  
17 were you defining the term channel?

18 A. Initially when I consider the word channel,  
19 I'm considering more, I would say, the active channel,  
20 which one might argue is up to, let's say, the ordinary  
21 high water mark. This is a channel where there is  
22 enough frequency of flow that vegetation -- Mr. Fuller  
23 had some other key elements. Vegetation is a key one in  
24 soil development. But there's enough flows of enough  
25 frequency that it's not a stable environment. That

1 active channel then is, one, considered the active  
2 floodplain. As we all know as hydrologists, it gets  
3 more complicated because once you go up above that  
4 ordinary flow, then you get into perhaps another  
5 floodplain or higher floodplain. Some of these,  
6 depending on what rivers you have, you may have  
7 different levels of floodplains depending on how high up  
8 the flow gets, and some of those outer or higher  
9 floodplains, obviously, you need a lot more flow or a  
10 more rare flow event.

11 So this initial -- the discussion in my report  
12 when I talked about, for example, in the Safford area in  
13 the floodplain -- let me rephrase that -- the channel  
14 had gotten wider. I believe Burkham from the USGS and  
15 as I was stating it is that active floodplain where  
16 there's no vegetation, that the last storm event has  
17 removed that vegetation.

18 Now, within that active floodplain, you then  
19 get to things like the low flow channel that Mr. Fuller  
20 has taken a lot of time discussing. I think in a  
21 braided environment, I am -- my opinion on that is more  
22 consistent with Mr. Gookin's and Mr. Mussetter's,  
23 Dr. Mussetter's, that in a braided condition, you can  
24 have multiple low flow channels.

25 And I say that, and maybe I'll just let the

1 pictures do the talking. Again, there was a picture in  
2 my report, and I think I testified this morning about  
3 that, where the Gila River at Calva, looking at that  
4 picture, and it was in February when the flow wasn't  
5 high. I would, I would find it difficult to see where  
6 the low flow channel is. It seems like there was more  
7 than one low flow channel.

8 Q. And oftentimes from a photograph, it's  
9 difficult to distinguish, is it not, between where the  
10 active channel ends and the low flow channel begins?

11 A. I would -- I don't disagree that there are  
12 areas in photographs where that might occur. Certainly  
13 the photograph of Calva, I think most reasonable people  
14 looking at that wouldn't guess that there is more than  
15 one active channel in that area. At least that's my  
16 opinion.

17 Q. I just want to backtrack a little bit, just  
18 ask you, what parts of the Gila River have you had the  
19 chance to either study or at least explore in the last  
20 several years?

21 A. Well, I have to admit, I get motion sick very  
22 easily, and I was telling my wife that when I watched  
23 Mr. Fuller's videos, I almost got sick, and I'm not  
24 embarrassed to admit that. I flew the river similarly  
25 to Mr. Fuller, maybe not as quickly. But that was

1 perhaps my best sense of what it's like on the ground.

2 I have not done fieldwork recently in that area.

3 Q. And I'm talking about the entire Gila River  
4 now.

5 A. Oh, we're talking about the entire now.

6 Q. Yeah. I might break down your fieldwork on  
7 Segments 1 through 3.

8 A. Sure.

9 Q. But you have flown Segments 1 through 3 in an  
10 aircraft?

11 A. No. I --

12 Q. Oh, you flew it the same way that Jon did?

13 A. I just did it in a way that I didn't make  
14 myself throw up.

15 Q. And both of you are now experienced pilots,  
16 correct?

17 A. Yes.

18 Q. But you have done that same Google Earth or a  
19 similar program flyover of Segments 1, 2, and 3 or A, B,  
20 and C?

21 A. My A, B, and C, that's correct.

22 Q. And how much on-the-ground work have you  
23 actually done on the Segments 1, 2, and 3 of the Gila?

24 A. I've been through the area, but not for the  
25 purposes of studying it.

1 Q. And you've never boated Segments 1, 2 or 3 of  
2 the Gila, have you?

3 A. Unfortunately not, no.

4 Q. And then going down from 4, 5, 6, 7, and 8 or  
5 essentially from Safford or thereabouts to Yuma, what,  
6 if any, either recreational exploring have you done or  
7 fieldwork have you done along the Gila and when?

8 A. You know, the focus of my report being  
9 Segments A, B, and C, I did not do any additional work  
10 above reading the evidence that was entered for those  
11 other segments.

12 Q. And have you ever had occasion to boat any of  
13 the other segments of the Gila River?

14 A. No. I live in Ahwatukee, which is almost  
15 bordering the Gila River Indian Community, so I guess  
16 visually every time I've driven down to Tucson I've had  
17 the opportunity to look over and see what the river  
18 looks like. So I guess if that counts as drive-by  
19 fieldwork, then so be it.

20 Q. And these days because of, largely because of  
21 damming and diversion, we seldom see -- unless there's a  
22 dam release -- water -- or a heavy rain or storm --  
23 water flowing through the Gila River Indian Reservation?

24 A. I've seen it a few times, but it's certainly  
25 less common than one would, one would hope.

1 Q. If you want to find it, you can, but I don't  
2 necessarily think you need to read anything, because I'm  
3 not going to quote from it, nor am I going to read it.

4 A. Okay.

5 Q. But at Page 9 in Paragraph 46, there's a  
6 discussion about military use, and I'm not going to get  
7 into the specifics of that. But would you consider  
8 military transportation to be a commercial use, whether  
9 it's on land or water?

10 A. You threw me on the "on land or water" part.

11 Q. Okay. Let's just use on water. I'm not  
12 suggesting --

13 A. Oh.

14 Q. -- that there's a history of it that's been  
15 documented.

16 A. Okay.

17 Q. But if the military were using the rivers for  
18 purposes of transportation or supply, would you consider  
19 that to be a commercial use within the parameters of  
20 Daniel Ball and the subsequent case law?

21 A. If they were using the river not perhaps as we  
22 witnessed in the upper Gila where it's just being used  
23 to ferry across, if they're actually using the river up  
24 or down or both to transport either troops or associated  
25 with supplies, I would say that yes, that would be a

1 commercial use by the military.

2 Q. But you wouldn't consider if they -- if the  
3 water was too deep to cross, the ferrying of supplies or  
4 equipment or soldiers across a river to be a commercial  
5 military use?

6 A. Yeah. And Mr. Katz, please, when I say this,  
7 please don't take offense when I say it this way.

8 Q. I'm not going to be offended.

9 A. Okay. Not being a lawyer, I know there has  
10 been a lot of case law over this issue about ferry  
11 crossings, and maybe I've misread that case law.

12 My understanding with ferries is that absent  
13 other lines of evidence, if it's just solely the use of  
14 ferrying to not travel with the flow, but to cross the  
15 flow -- maybe I should put it, if the ferrying could  
16 have been otherwise avoided by simply building a bridge  
17 over it, then my understanding of case law is that that  
18 is not a line of evidence that one might use to support  
19 navigability. But the reason I said that preface is I'm  
20 not a lawyer, and I'm not here to give legal opinions,  
21 but that's my understanding.

22 Q. And I'm not here to argue law with you either.

23 A. Great.

24 Q. And if I get to doing that, I hope the  
25 Chairman or the other Commission members will give me a

1 good swift kick.

2 MS. HERNBRODE: I'll kick you.

3 THE WITNESS: Likewise.

4 MR. KATZ: Joy will do it for them.

5 THE WITNESS: And my counsel will probably  
6 kick me outside and say why are we talking law, you  
7 know, you're a hydrologist.

8 BY MR. KATZ:

9 Q. At Page 2 of your report, you use the term  
10 "sustained commercial use." What do you mean by the  
11 term "sustained" in that particular line or portion of  
12 Page 2?

13 A. Yeah. Could you -- I'm sorry, which paragraph  
14 was that?

15 Q. It's Page 2.

16 A. I just want to make sure we're talking about  
17 the same thing.

18 MS. HACHTEL: Paragraph 10.

19 BY MR. KATZ:

20 Q. Paragraph 10.

21 A. 10? Okay. Mr. Katz, this kind of delves into  
22 this range of where us hydrologists are being asked  
23 whether we like it or not, to consider case law. My  
24 reading of Daniel Ball is that the word "highway for  
25 commerce" constitutes some type of reliability,

1 usefulness, sustainability, regularly, regular nature of  
2 use of that waterway for that purpose. So when I say  
3 sustained or sustainable, what I'm referring to is that  
4 maybe an isolated boating incident certainly can be and  
5 should be considered.

6 But I think that there needs to be enough of a  
7 regular use of the river that there's a commercial  
8 reality about using the river in that means, if that  
9 helps. Maybe -- does that answer?

10 Q. Uh-huh.

11 A. Okay.

12 Q. And when you talked about commercial, what did  
13 you mean by -- you talked about sustained, and then  
14 commercial. What do you mean by commercial use? At  
15 least, what's your understanding of how that term is  
16 used by you in your report?

17 A. Yeah, and that's a fair question. Certainly  
18 trade, and I know there was some discussion this morning  
19 about -- or this week about is it trade or travel, and  
20 trade and travel. I will maybe go on what PPL Montana  
21 said, and I think in there it's trade and travel in that  
22 case.

23 I think when it comes to commercial, and I  
24 certainly understand the arguments that attorneys have  
25 had over this issue about does it have to be profitable

1 or not. I think it comes down to if it's not for profit  
2 or somebody benefiting from the practice, then it has to  
3 be part of their livelihood, perhaps. And again, I'll  
4 try my best to distinguish it from a, let's say,  
5 personal recreation. Maybe it's almost easier for me to  
6 say what it's not. Sometimes it's easier to do that.

7 I would say that a personal use of a  
8 recreational craft in my mind would not be what I  
9 consider commercial. And obviously your expert and I  
10 differ perhaps on that.

11 So it wouldn't include a personal recreational  
12 craft. But conversely, it's certainly, if you've got a  
13 trapper who's got a canoe loaded up with pelts and it's  
14 being used, and not just one isolated event, but is  
15 being used consistently, and there's a record of it. It  
16 has become a highway -- when I hear the phrase "highway  
17 for commerce," I kind of get the impression this is  
18 something that is a reliable, recognizable use.

19 Q. Okay. And you're familiar with the Post  
20 Office that loses substantial money every year?

21 A. We're referring to our current U. S. Postal  
22 Service?

23 Q. Correct.

24 A. I don't know exactly what their financial  
25 situation is, but the last I heard, they were thinking

1 about maybe canceling Saturday delivery, so I might  
2 infer from that that financially they're not doing  
3 great, so --

4 Q. And even if at or about the time of statehood  
5 they were doing financially better than they are now,  
6 the Post Office wasn't run for profit, correct? It was  
7 to provide a service to you, me, and the public.

8 A. Oh, this is probably an area -- well, not  
9 probably. I do not know about the financial --

10 Q. Okay.

11 A. The finances of the Post Office. I guess I  
12 couldn't -- I don't know if it was a profit business or  
13 not. I just don't know. Sorry.

14 Q. And I'm not really trying to get into the  
15 financial records of the Post Office --

16 A. Sure.

17 Q. -- although it might be interesting in some  
18 other occasion. But we do have a circumstance or  
19 situation where you previously testified that you  
20 believed delivery of mail would be a commercial, by a  
21 boat or vessel on water would be a commercial purpose?

22 A. Yes. I would agree that that would be one of  
23 the -- we talked about several different ways that a  
24 river could be used commercially, sure.

25 Q. And I think you may have already answered my

1 next question in part just a minute or two ago.

2 A. Okay.

3 Q. But there isn't a requirement that the  
4 sustained commercial use be of heavy loads, such as 50  
5 tons or a hundred tons of ore, correct?

6 A. That certainly is one thing that could and can  
7 be considered, but it's certainly not the only  
8 requirement.

9 Q. In other words, there are navigable rivers  
10 that might have limitation with respect to the type or  
11 size of the boat that couldn't carry ore or large  
12 quantities of supplies, correct?

13 A. The rivers that I'm aware of that are  
14 navigable, from my understanding, would be able to carry  
15 some pretty good loads, but maybe you're aware and you  
16 can tell me of one that does not.

17 Q. The only thing I was referring to, and maybe  
18 the river could carry some of the, our rivers could  
19 carry larger loads, but you did indicate that a trapper  
20 in a canoe that was fully loaded with pelts and was  
21 operating consistently would in fact be a commercial  
22 use, correct? It doesn't have to be in a steamboat or a  
23 keelboat.

24 A. I think that under that hypothetical, there  
25 would need to be other factors taken into consideration.

1 For example, how consistently and regularly was that  
2 trapper using it, how long was the reach that he was  
3 using it. But in general, I would agree that that is a  
4 type of commercial use of a watercourse, sure.

5 Q. Now, am I correct in understanding that your  
6 only basis for determining the three-foot requirement  
7 for boating is the report of the Special Master in the  
8 1931 Utah case?

9 A. No, I wouldn't say that. I think that is  
10 certainly one factor I looked at. And we talked  
11 about -- not we. The group has heard testimony this  
12 week about the Washington standard, and I understand  
13 that that isn't necessarily a regulatory requirement in  
14 the State of Washington, but it's a, it's a threshold  
15 that they use. I think I'm probably putting words in  
16 your mouth or maybe your expert about it being a  
17 screening tool. What struck me about that, Mr. Katz, is  
18 that the different depth criteria, I think it was less  
19 than 2 feet, probably not, 2 to 3.5, maybe under certain  
20 conditions, and then greater than 3.5 feet probably.

21 What was interesting to me about that is to  
22 put that, those thresholds into context of what Utah did  
23 look at, and ironically, they're not that inconsistent.

24 Where I struggle perhaps with your expert, and  
25 you're probably going to say we're not talking about

1 your expert. But this notion of maybe six inches  
2 being -- it's not, you know, hey, Burtell it's not three  
3 feet, it's six inches. I struggle with that because I  
4 don't -- I'm not aware of any rivers, and maybe you can  
5 tell me one, that have been deemed navigable for state  
6 title which had flows of that small of amount that were  
7 determined in a court setting to be navigable.

8 And so I think Washington is useful in that it  
9 adds on to the Utah case. I think the Utah case is also  
10 provocative for us, before the Commission, because of  
11 the time. It was -- even though that decision was  
12 issued, I think in 1930 --

13 Q. '31. I think about 1931.

14 A. 1931. The survey and the -- that I reference  
15 in my report was done in 1908, and certainly having  
16 looked at the testimony of some of the Special Master's  
17 witnesses, they were looking at boats on and before, if  
18 not after, our statehood, so --

19 Q. If I might interrupt.

20 A. Please.

21 Q. Because I don't want to go off on a tangent.

22 A. And I probably am, so --

23 Q. No, that's fine. I am just really trying to  
24 ask you if you relied on any other sources of  
25 information other than, you've mentioned --

1 A. Oh, okay.

2 Q. -- the state of Washington might have its  
3 criteria or suggested criteria. And you've mentioned  
4 what the Special Master found.

5 A. Yes.

6 Q. Is there anything else that you base that  
7 determination upon?

8 A. I would say the one other that I think  
9 is of -- should be of value and interest to the  
10 Commission to look at is the Colorado River, which --  
11 and I don't exactly know, and I think Mr. Gookin and you  
12 or maybe Mr. Helm went around about exactly how the  
13 Colorado was deemed navigable.

14 But for the -- presuming that the Colorado  
15 River is recognized -- but I think we agree that it is  
16 navigable -- that's a river that has, based on historic  
17 records, depths that are, you know, more on the order of  
18 four or five feet. So this is, to me, even another line  
19 of evidence above and beyond the Special Master and  
20 Washington, 1183 22.

21 That regardless of what the actual depth is,  
22 look at a river where you're actually having commerce,  
23 and it has been determined to be navigable and you look  
24 at what those depths are. And, you know, when I do  
25 that, I come to a conclusion similar to Mr. Gookin that

1 it's not six inches. It's probably more on the order,  
2 at our time of statehood and in light of the boats that  
3 were available at that time, three feet seems closer to  
4 it. If we had a standard, it would make our lives  
5 easier, I suppose, a number.

6 Q. Bear with me for a second.

7 A. Sure.

8 Q. And you just told us you believe that the  
9 Colorado River is navigable, at least at present?

10 A. Oh, if I did, I misspoke. What I meant to say  
11 is based on discussions that I heard this morning that  
12 in some, in some either legislative or legal arena, it  
13 was deemed to be navigable.

14 Q. But you did discuss earlier today many  
15 examples of commercial uses of the Colorado River at or  
16 before statehood, did you not, including operation of  
17 ferries regularly?

18 A. I did. And certainly Dr. Lingenfelter's book,  
19 I think, provides clear evidence of a watercourse that  
20 was practically and usefully being used for commerce at,  
21 at -- prior to statehood, excuse me.

22 Q. And as you've used the term, I'm not asking  
23 now about the Gila, but can a braided river channel be  
24 navigable?

25 A. You know, I've heard testimony to that effect.

1 But what I haven't heard is anyone tell me what one is.  
2 I suppose under -- now, I have heard extreme examples  
3 like the Mississippi River is braided, so that's  
4 navigable. Why are we having this discussion?

5 But in terms of a southwestern stream that is  
6 braided that has been determined in a legal setting to  
7 be navigable, I'm not aware of one; but if you have one,  
8 you know, that would be great for me to understand.

9 Q. And again, in general though -- I mean, a lot  
10 of rivers that have been determined navigable have  
11 portions or segments of them that are braided or that  
12 meander, correct?

13 A. Do you -- I know I'm not supposed to ask the  
14 questions, but I'm just trying to understand.

15 Q. In other words --

16 A. Do you have an example of one?

17 Q. I'm not here -- I just was wondering whether  
18 or not in your experience you believe that a river that  
19 is braided, if it has sufficient flows within whatever  
20 standards this Commission might determine appropriate,  
21 could be or is navigable, navigable or susceptible to  
22 navigation?

23 A. So absent an example, this is, this is -- I  
24 guess we're talking a hypothetical here.

25 Q. Yes, sir.

1 A. So under those circumstances? Well, I think  
2 it would go back to the various lines of evidence that I  
3 pulled together, and that is -- and the other experts,  
4 Dr. Littlefield, Dr. Mussetter, and Mr. Gookin, is under  
5 those circumstances then, look at all of the lines of  
6 evidence for such a hypothetical and see whether or not  
7 those lines of evidence in their entirety give you that  
8 conclusion. And maybe this is my second time for saying  
9 I hope I'm not being evasive, but that's how I would  
10 answer it.

11 Q. That's fine.

12 I am going to ask you today when we look at  
13 Segments 1 through 3 or what's been termed the upper  
14 Gila, is the flow channel or low flow channel of the  
15 Gila River in Segments 1, 2, and 3 or A, B, and C  
16 braided today?

17 A. Braided today? My understanding of flying  
18 over the river and looking at Mr. Fuller's flyovers as  
19 well as my own, that the river is certainly not in the  
20 condition it was at statehood in terms of that level of  
21 braiding at that time.

22 And not that we probably want to get into a  
23 discussion about vegetation and tamarisk, but there has  
24 been at least since the '40s and '50s quite an invasion  
25 of tamarisk into the Valley that it's perhaps more

1 difficult to look at that watercourse now and make  
2 conclusions about whether or not it would be braided or  
3 not.

4 Insofar as there's such a predominance of an  
5 invasive species in there that it has really complicated  
6 the geomorphology. That invasive species wasn't around  
7 at statehood, at least not in much concentration that  
8 I've read.

9 So I would say now it's in Segments A, B --  
10 what I call A, B, and C, that the river is more in a --  
11 there are areas where the channel is braided, the active  
12 channel. We've had that discussion. And there's other  
13 areas where it's single. I'd say now it's harder to  
14 just put it into one box or the other.

15 Q. Bear with me just a second.

16 A. Sure.

17 Q. I believe that I'm done with my questioning  
18 but now I'll turn it over to the person that's a little  
19 smarter than I am to, hopefully, finish things up.

20

21 CROSS-EXAMINATION

22 BY MS. HERNBRODE:

23 Q. And Mr. Burtell, we haven't done this thing  
24 formally yet, but I wanted to let the Commission know  
25 I've given Mr. Burtell the instruction to call me Joy

1 because my last name is difficult even for me on  
2 noncaffeinated days. So I'm not going to impose it on  
3 anybody else.

4 I just have a couple of things, and --

5 A. And Joy, if I can interrupt, feel free to call  
6 me Rich.

7 Q. Thank you, that will help me. I'm an informal  
8 person by nature as well.

9 CHAIRMAN NOBLE: What joy it gives us to hear  
10 about the rich.

11 THE WITNESS: It won't be long, it won't be  
12 long before poems perhaps are written.

13 BY MS. HERNBRODE:

14 Q. I just want to make sure that I've understood  
15 some of your answers to Mr. Katz today.

16 A. Okay.

17 Q. So I'm going to repeat them back in  
18 lawyer-dummy language. What I'm looking for is a yes or  
19 no. If you don't agree with my statement, don't worry.  
20 I'll give you the opportunity to respond or your  
21 attorney will. But I just want to make sure I've heard  
22 you correctly.

23 A. And if I'm reading between the lines, Rich,  
24 don't ramble on; it's a yes-or-no question, say yes or  
25 no or -- now --

1 Q. I also would desperately like to get home to  
2 my little boy today.

3 A. Got you. If I could also throw in that there  
4 might be cases where it's not a yes-or-no question,  
5 so --

6 Q. I understand.

7 A. Okay.

8 Q. Okay. For the first set, I'm just trying to  
9 repeat back to you what you said.

10 A. Okay.

11 Q. Okay. Paul asked you whether -- what your  
12 definition of a flood is. And you talked about a  
13 two-year high flow. Is a -- you're talking about flow  
14 duration stuff. Is a two-year high flow a flood or  
15 what, or not?

16 A. It would depend on how you're defining flood.  
17 I don't think that was a yes-or-no question.

18 Q. I'm asking how you would define -- do you  
19 define flood as a two-year high flow?

20 A. That is one way of defining flood. It's not  
21 the only way.

22 Q. Is that the way you used in your report to  
23 define flood?

24 A. No.

25 Q. What way did -- when you talk about flood in

1 your report, what are you talking about?

2 A. Okay. I understand. When I talk about flood  
3 in my report, I am talking about -- without putting a  
4 return period on it -- a flood event of a magnitude and  
5 frequency that would certainly be greater than two.  
6 Whether it would be a ten-year event or fifty-year event  
7 or a hundred-year event is difficult for me to tie down.  
8 But it would be an event that would certainly occur on a  
9 frequency less often than every couple years.

10 So what was I thinking when I used the term  
11 flood? I would say certainly something that might not  
12 occur once every ten or fifty years, let's say.

13 Q. Okay. And I really didn't understand your  
14 answer for what is a drought. So please try again in  
15 much smaller words.

16 A. Sure. And drought, obviously, is a relative  
17 thing, depending on who's asking the question.

18 Q. In your report.

19 A. So as I use the word drought in my report, I  
20 would consider a drought to be a time when the flow, at  
21 least on an annual basis, is substantially less, similar  
22 to a return period with floods; that it's a flow period  
23 that might not occur more than once every ten years or  
24 fifty years. It's an unusual event.

25 And the problem when you ask that in a general

1 sense, and us as technical people, is that all of these  
2 events occur over kind of a continuum. It's just that  
3 some occur with higher probability than others. So  
4 you're saying, well, what prob -- maybe you're asking  
5 what probability are you using in your report to  
6 constitute a flood? And I didn't use any one  
7 probability. I used an event that if you were going to  
8 try to tie me down on a number, probably, certainly  
9 greater than the ten or maybe fifty-year event.

10 Q. And you used the word flood in your last  
11 description.

12 A. Oh, I'm sorry.

13 Q. You meant drought?

14 A. That could be used interchangeably with  
15 drought, sure.

16 Q. Okay. All right. And then when you talked  
17 about channel, you talked about the active channel being  
18 different from the ordinary high water mark. Is that  
19 correct?

20 A. Let me see. If I did, then I may have  
21 misspoke. I would say that at least my definition of an  
22 active channel, particularly if it's braided, is that an  
23 active braided channel can be quite wide; and within  
24 that active braided channel, you could have several  
25 channels. There's always going to be the lowest flow

1 channel, although even in some cases, you could have two  
2 in a certain area that are effectively the same.

3 So in that situation, the active channel one  
4 might relate that to, let's say, an ordinary high water  
5 mark which is maintained by a flood event every year or  
6 two.

7 Q. Okay. So the active channel is for you the  
8 area that is inundated -- ooh, I used a new word --  
9 during the seasonal high water period?

10 A. Yes. I think that's a way that you could  
11 characterize it.

12 Q. Okay. Thank you.

13 A. Sure.

14 Q. All right. Forget my earlier instructions.  
15 You can now answer any way you want because we haven't  
16 asked you these yet.

17 A. Okay.

18 Q. Although I appreciate you being brief.

19 A. Understood.

20 Q. Okay. These are the fun ones. You've boated  
21 before?

22 A. I have.

23 Q. Okay. I remembered you talking about boating  
24 on the Green River; is that correct?

25 A. Both the Green and the -- well, the Green and

1 the Colorado -- I guess it used to be called the Grand  
2 in Utah.

3 Q. And where on the Green?

4 A. Various outfitters have opportunities to float  
5 down the Green River in a couple of different places.  
6 But I'm trying to remember my river miles. I have gone  
7 from maybe 50 to 60 miles upstream of the confluence of  
8 the Green with the Colorado.

9 And then on the Colorado, I've gone from the  
10 town of Moab down to the confluence. I've done it in a  
11 metal canoe, and at that point Cataract Canyon starts,  
12 and if you're in a metal canoe, you probably need to get  
13 yourself out of there, so that's where I stopped.

14 Q. Okay. But you talked about a commercial  
15 outfitter. So were some of those trips where somebody  
16 else was a pilot or were those trips where you were  
17 running the boat?

18 A. The outfitter in that circumstance was being  
19 used to drop us off and pick us up. And in the case of  
20 the pickup, they actually take a jetboat down the  
21 Colorado, put all of the canoes on it, and then you  
22 jetboat back up the river.

23 Q. Okay. But you piloted the boat yourself?

24 A. I piloted the canoe but not the jetboat,  
25 obviously. It wasn't mine. So --

1 Q. Okay. And then I believe you said today that  
2 you had boated some portion of the San Juan?

3 A. No. And if I did, if I said that, I misspoke.  
4 I have on my way to those very river trips we just  
5 mentioned, on my way to Moab coming from Phoenix, one  
6 goes through a little town called Mexican Hat near the  
7 border. Many people probably have been there  
8 themselves. And that is a common put-in point. Maybe  
9 take-out, too, for river trips along the San Juan. So I  
10 have been able to witness people going down the river in  
11 that area.

12 Q. Okay. So three or four trips total?

13 A. My trips down the Green --

14 Q. Total boating trips ever.

15 A. So we're just talking rivers, not on the  
16 ocean?

17 Q. Right.

18 A. Okay. I would say going down the Green and  
19 the Grand in their totality, probably as many as ten  
20 times, I guess.

21 Q. Okay. And no other rivers other than the  
22 Green and the Grand?

23 A. Well, I'm --

24 Q. Have you done the Disneyland thing?

25 A. Well, I was going to say, it's not, it's not

1 quite to Allen's standard there; but thanks to  
2 Mr. McGinnis's client, I am proud to say when I was in  
3 graduate school at the U of A -- I have to have my  
4 Wildcat plug in here somewhere -- I was convinced to  
5 come up to Phoenix and take benefit of the releases from  
6 his reservoirs. So I have tubed very gently down the  
7 Salt. I will let the Commission and the audience  
8 determine whether that constitutes boating. But then  
9 again, Mr. Gookin's boating adventures were probably of  
10 similar interest.

11 Q. I'm sure we'll talk about those more when we  
12 get to the upper and lower Salt.

13 A. I bet.

14 Q. All right.

15 MR. KATZ: I just was wondering whether you  
16 were carrying refreshments in the tube that accompanied  
17 you.

18 THE WITNESS: Let's just say there was an  
19 extra tube, as they say, so --

20 BY MS. HERNBRODE:

21 Q. Do you have any expertise in boats or  
22 boating?

23 A. Those boating experts still in the room, I'm  
24 sure Mr. Fuller would agree that the type of trip I took  
25 down the Green and the Grand in a canoe is one type of

1 boating. I haven't done any whitewater -- and I did  
2 forget. I did one commercial whitewater trip on the  
3 Arkansas. Similarly, but unlike these canoe trips,  
4 you're actually in a rubber raft with an outfitter and  
5 taking benefit of the high spring runoff. Can't  
6 remember what the level of rapids were, but pretty good.

7 Q. What's your expertise regarding historical  
8 boats?

9 A. Well, I think similar to many of the experts,  
10 I am a student of the history of the boats. Not being  
11 myself a nautical engineer, I have to learn about boats  
12 by reading about them. I don't have any educational  
13 background.

14 One of the reasons I brought Dr. Lingenfelter  
15 into our team or asked him to be part of our team was  
16 having that experience about boats. Historic boats in  
17 Arizona.

18 Q. Okay. How about modern boats?

19 MR. SPARKS: When?

20 BY MS. HERNBRODE:

21 Q. What's your expertise in modern boats?

22 A. Modern boats, again, I don't own -- I think  
23 Mr. Helm has a Bass boat. I don't have a Bass boat,  
24 although I've been on those. My only boating experience  
25 is I think what I've indicated, so that's also my

1 knowledge. And it won't be -- I won't be able to tell  
2 you what a boat is, what materials it's made of, if  
3 that's what you're asking.

4 Q. Okay. I also failed to understand your answer  
5 on the braided river question. So --

6 A. Okay.

7 Q. -- am I correct in understanding that your  
8 opinion is that a braided river cannot be navigated --  
9 navigable?

10 A. I think as I stated in my report that when a  
11 channel becomes braided and divides into multiple  
12 channels that have water in them, as I have photographic  
13 evidence, at least, of and also field measurements of in  
14 the upper Gila, that by splitting the flow into multiple  
15 channels it makes it even more shallow. So you can come  
16 back and say, well, the Mississippi is braided and  
17 you're certainly using that for commercial purposes.

18 In Arizona, I'm not aware of a braided channel  
19 with the type of flows that we have in Arizona that  
20 would have depths sufficient to be used as a highway of  
21 commerce.

22 Q. Rich, I get that you think that a braided  
23 channel is much less likely to be navigable.

24 A. Okay.

25 Q. What I want to know is, do you think a braided

1 channel can never be navigable? Is there a hypothetical  
2 situation in which a braided river would be navigable?

3 A. Under a hypothetical condition, yes. You  
4 could have a braided channel that is navigable.

5 Q. Okay. All right. Can you turn back to your  
6 Figure 4 photos?

7 A. Okay.

8 Q. All right. These are all after statehood.

9 A. That's correct.

10 Q. And the Gila is not in its ordinary and  
11 natural condition in any of these photos?

12 A. From a flow perspective, I would say no, but  
13 not necessarily from a channel characteristic  
14 perspective.

15 Q. Okay. So you said the Calva channel there is  
16 braided?

17 A. Yes.

18 Q. Okay. Is the photo of Coolidge upstream from  
19 the Coolidge Dam site, does that show a braided channel?

20 A. And I'll apologize to you as I have done to  
21 the Commission, that it's not the greatest photo and  
22 I've used my magnifying glass. But when I've looked at  
23 that closely, you can see not just isolated, but several  
24 islands in that reach that I would constitute indicates  
25 a braided condition.

1 Q. So several islands would constitute braiding?

2 A. In this situation, yes.

3 Q. Your photo of Bonita Creek, is that a Jeep  
4 parked on the sand there?

5 A. Believe it or not, I think it's a Model T. If  
6 you take a look at the photo, I think it's 1932. And  
7 when I looked at it and you blow it up, it's actually a  
8 Model T or something of that age.

9 Q. And does that photo show braiding?

10 A. No.

11 Q. Okay. How about the one at Clifton there?

12 A. No.

13 Q. And the Blue Creek?

14 A. You know, Blue Creek has not been discussed.  
15 It's actually in New Mexico. Now, this is in the  
16 summertime, and I don't know if the monsoon had started  
17 yet. This is in July. There's a pretty big island  
18 there, so it appears from this angle that the stream  
19 continues to the left where we can't see it. But I  
20 would say based on that, that this area is probably  
21 braided.

22 Q. Because there's one island there?

23 A. Well, looking at that island and then  
24 subsequent downstream, yeah.

25 Q. Okay. Can you flip to your -- and I

1 apologize, my copy of your report looks like this, so I  
2 think --

3 A. Oops.

4 Q. -- I covered all the photos on that page.

5 A. Sure.

6 Q. Can you flip to your Figure 7 photo that we  
7 talked about a little bit?

8 A. Okay.

9 Q. Can you tell me about the last wagon, or I  
10 guess you have that described as a trailer. How high is  
11 the water on that wagon?

12 A. You know, I can't see it too closely, but I  
13 believe I can see the wheels, and it looks like it might  
14 be, you know, maybe shortly below the axle.

15 MR. BREEDLOVE: Do you have a better copy than  
16 we do?

17 THE WITNESS: No. Well, mine is blown up,  
18 Mr. Breedlove, but I apologize. It is not the greatest  
19 of photos.

20 BY MS. HERNBRODE:

21 Q. I can see how on the front wagon it appears to  
22 be just below the axle. On the back wagon does it look  
23 like it's below the one, that same depth?

24 A. It does to me. But maybe it's how one views  
25 or interprets a photograph.

1 Q. And do you know how tall a wagon wheel is?

2 A. You know, I didn't until I went down to the  
3 Arizona Historic Society in Tucson, and they actually  
4 have a wagon that was typical of the period in their  
5 museum, and I was able to stand up next to it and look  
6 at its wheel.

7 Q. And how tall is that wheel?

8 A. It appeared to me that it was probably on the  
9 order of about three or four feet. So with the axis at  
10 about a couple of feet.

11 Q. Okay. I'm going to ask you a hypothetical.  
12 So focus.

13 A. I'm trying my best.

14 Q. If 75 percent of the time historic users of  
15 the river crashed their boat, were seriously injured,  
16 and lost their cargo, your opinion would be that  
17 historic boating was unsuccessful. Is that correct?

18 A. With a hypothetical like that I --

19 Q. Only 25 percent of the time people got through  
20 with no problems.

21 A. I have difficulty answering whether that would  
22 indicate that the river was navigable or not, if that's  
23 the only piece of information. So I think I would  
24 answer that by saying if that was the only piece of  
25 information that was provided in your hypothetical, then

1 I would not, based on that alone, make a determination  
2 of navigability.

3 Q. I wasn't asking you for navigability.

4 A. Okay. I'm sorry.

5 Q. I'm asking you if you would characterize, you  
6 have -- I can't do math. You have a hundred trips. 75  
7 of them crash and burn. 25 of them do fine. Would you  
8 characterize that overall record as successful or  
9 unsuccessful boating?

10 A. Please don't get mad at me when I ask this  
11 follow-up question. But is there a difference between  
12 the 25 percent that failed versus the 75 that didn't?  
13 And I don't mean to be flip. Please. This is serious  
14 stuff, I understand.

15 Q. You have them switched. 75 percent of  
16 trips --

17 A. Failed.

18 Q. -- failed. Somebody died, they lost their  
19 cargo, and the boat crashed.

20 A. Right.

21 Q. 25 percent of the time everybody was fine.

22 A. Okay. And again --

23 Q. Assuming all other factors equal.

24 A. Well, but the problem I have with that type of  
25 broad hypothetical, Joy, I apologize. I'm not going to

1 say without knowing more information whether or not,  
2 like, for example, the 25 that were successful versus  
3 the 75 percent that were not, was it using the same type  
4 of boat?

5 Q. Yes.

6 A. Was it during the same year with the same  
7 amount of water in it? There is no circumstances that  
8 would explain why the 25 percent failed and the -- or  
9 the 75 percent failed and the 25 -- they were all for  
10 the same reason?

11 Q. Exactly.

12 A. So you're asking me, I guess, whether  
13 something that's --

14 Q. This is an extremely hypothetical question. I  
15 understand that.

16 A. Okay. If it's anything like whether you get  
17 75 out of a hundred answers correct on a test, then I  
18 suppose that you take that home to your parents and you  
19 say I got a C, and that C will be left to your parents  
20 to say whether it's successful or not.

21 Q. So if you're the parent, is that C successful?

22 A. Depends on the standard of your parent. I  
23 mean, if you've got a parent who wants straight As  
24 then -- I mean, I don't -- again, guys, I don't find  
25 this necessarily funny. I know it's funny, but to try

1 to lock me down about whether I think 75 percent is  
2 successful or not --

3 MR. HOOD: Rich, she asked you if 75 failed.

4 THE WITNESS: I'm sorry, 75 failed. I get  
5 that. 75 failed.

6 FEMALE VOICE: It's an F.

7 THE WITNESS: Okay. Yes. You're right. So  
8 75 as a failure rate. I would say that you have failed  
9 the test, and so that would not be successful. I  
10 apologize. I kept mixing them up. Yes.

11 MS. HERNBRODE: Thank you. Okay.

12 THE WITNESS: Okay. Sorry about that.

13 BY MS. HERNBRODE:

14 Q. Okay. That's the only math question I have.

15 A. Got you.

16 Q. All right. It's upstream from Yuma to Fort  
17 Goodwin, right?

18 A. Yes.

19 Q. Okay.

20 CHAIRMAN NOBLE: Look at the answer you got  
21 though. I'm just proud of you.

22 MS. HERNBRODE: I know.

23 MR. KATZ: Yes.

24 MS. HERNBRODE: I count that as a win.

25 THE WITNESS: It's a rare case where I was

1 able to quickly answer yes.

2 BY MS. HERNBRODE:

3 Q. Can you transport 50 tons of goods in a boat  
4 in three feet of water?

5 A. From Yuma to Camp Goodwin?

6 Q. No, no. I'm sorry. We're done with Camp  
7 Goodwin and Yuma. If you have three feet of water --

8 A. Oh.

9 Q. New question.

10 A. Okay. Okay.

11 Q. I'm now completely skipping around, and I  
12 apologize if that's difficult. But assume the next  
13 question is unrelated to the one before it.

14 A. Okay.

15 Q. All right. Can you transport 50 tons of goods  
16 in a boat if you only have three feet of water?

17 A. It would depend on the nature of the boat.

18 Q. And is there a historic boat that would do  
19 that?

20 A. That would float 50 tons in three feet of  
21 water. I would suspect that on the Colorado River that  
22 might be the case.

23 Q. So a steamboat?

24 A. Could be, yeah.

25 Q. Okay. How about two feet of water?

1 A. I would say that once you get down to two feet  
2 of water, your ability to successfully float a boat --  
3 let me rephrase that.

4 It's not so much a question of floating the  
5 boat as it is to be able to successfully move that boat  
6 up and down the river or down the river. I would say  
7 based on the type of boats that were available on or  
8 before statehood in Arizona that floating 50 tons in two  
9 feet of water would not have concluded in a commercial  
10 enterprise. It would not have been successful.

11 Q. Okay.

12 A. That is, it would have failed, let's say, to  
13 go back to your 75 percent failure rate.

14 Q. All right. In your professional opinion, is  
15 it reasonable that the backwater of the Colorado would  
16 extend up the Gila five miles?

17 A. I base my knowledge of how far that backwater  
18 came up solely on the Commission's findings on the Gila  
19 River. I didn't read, I think it's the Stantec report,  
20 where they actually did an engineering study of that  
21 backwater. I believe the Commission, they had a section  
22 towards the end of their report that said, I believe, it  
23 was two miles that was determined based on that  
24 backwater study that was considered from the Colorado  
25 River.

1 Q. So two miles sounds reasonable to you?

2 A. I didn't look at that study, but I don't have  
3 any reason to question it. Maybe that's a better way of  
4 putting it.

5 Q. All right. Do you know if Mr. Lingenfelter  
6 was paid for his time in doing a declaration?

7 A. I believe he was.

8 Q. Okay. You talked about the gaging stations  
9 and the fact that they recorded whether or not there was  
10 a single channel or a multiple channel.

11 A. Yes.

12 Q. And, oh, God, I'm delving into math again. I  
13 want to make sure I got this right though.

14 At the Duncan gaging station, 80 percent of  
15 the time there was a single channel?

16 A. I'm not sure it was 80 percent. It might be a  
17 little --

18 Q. Can you look at Page 5?

19 A. Yeah. It's close to that, but --

20 Q. I had to do math, so help me out.

21 A. Okay. At the Duncan, I mean, we're  
22 essentially the same. I calculated 21 percent. So 79  
23 percent of the time, yes.

24 Q. Okay. I apologize, I apparently can't read  
25 either.

1           The York gage, it would be 74 percent of the  
2 time there was a single channel?

3           A.     That's correct.

4           Q.     And in the Gila Box, 97 to 100 percent of the  
5 time a single channel?

6           A.     Yes.

7           Q.     Okay. You mentioned that Mr. Fuller stated  
8 six inches of flow is the standard for navigability.  
9 Can you point to a slide in his report that says that?

10          A.     Maybe I misunderstood his three days of  
11 testimony. But I concluded from Mr. Fuller's testimony  
12 that six inches is more than sufficient. In fact,  
13 perhaps one could go down to three inches where you can  
14 without much, if any, difficulty use a recreational  
15 watercraft, and that that has a bearing on how he looked  
16 at the navigability of the Gila River.

17          Q.     Is it cheaper to ship by boat than ship by  
18 rail?

19          A.     I haven't done a comparison of the freighting  
20 rates of a boat on the Colorado River, let's say, versus  
21 the trains that were coming through at that time.

22          Q.     So you don't know?

23          A.     I don't know.

24          Q.     Okay. Can a horse cross a three-foot deep  
25 river?

1 A. Depending on the velocity, it could be tricky  
2 for the rider and the horse. If it's, say, three feet  
3 of water that's pretty, flowing pretty slow, that would  
4 be a lot easier than if there's some good current. And  
5 when I say by current, there's a velocity that goes with  
6 that three feet.

7 Q. Okay. Now I have to ask your equestrian  
8 expertise.

9 A. Well, I base that more on having been in water  
10 that deep and deeper as a human and the ability to be  
11 able to stand there. Now, I've got two legs and not  
12 four, but based on my experience with two legs and some  
13 pretty good velocities, the phrase being "knocked off  
14 your feet" comes to mind; and I would suspect that a  
15 horse would perhaps suffer from those same challenges as  
16 a human would, but I am not an equestrian expert.

17 Q. Okay. You would agree that the Gila was  
18 heavily diverted by 1890?

19 A. Yes.

20 Q. Is it your opinion that these diversions had  
21 no effect on what Mr. Fuller described as the low flow  
22 channel?

23 A. Those diversions would have decreased the  
24 amount of water in the low flow channel.

25 Q. But they didn't have an effect on the channel

1 morphology?

2 A. My opinion is that the channel morphology is  
3 primarily affected by the larger flood events, and  
4 you've asked me what I consider a large flood. So my  
5 opinion is that it is a flow event of a higher, a higher  
6 return -- a more rare flood event would have more of a  
7 lasting effect on that channel.

8 Q. Let me make sure that I understood what you  
9 said then.

10 A. Okay.

11 Q. So your opinion is that a flood would have a  
12 greater effect on channel morphology than diverted  
13 flows, but that diverted flows do have an effect?

14 A. They could have some minor effect, I believe,  
15 but not to the degree that a flood event would.

16 Q. And would diversions have an effect on channel  
17 shape?

18 A. Are the diversions -- or let me rephrase. Are  
19 the diversion structures permanent or temporary?

20 Q. In places where they're downstream of the  
21 diversion structures.

22 A. And thus my question. Is that type of  
23 diversion a concrete diversion that is more permanent,  
24 or is it like a stone, a twig-type of diversion that was  
25 originally used that would quickly get blown out after a

1 flood event? I'm just trying to understand, because  
2 that has a bearing on the effect that diversion might  
3 have downstream.

4 Q. Well, let's do both. The concrete structure.

5 A. I would certainly say that a concrete  
6 structure, which is going to have more permanency, will  
7 have a tendency of capturing sediment behind it and thus  
8 robbing the sediment below it. And that could have some  
9 effect over time, and the more effect, the bigger the  
10 dam is.

11 The early diversion dams that I'm at least  
12 aware of in Segments A, B, and C were of a, more of an  
13 organic build to them, and they -- I have accounts where  
14 these would quickly flush out and then they would  
15 rebuild them. So those, to answer your question, I  
16 think would have less of an effect.

17 Q. And Rich, you and I are putting the Commission  
18 to sleep, so I'm going to wrap this up really quickly.

19 CHAIRMAN NOBLE: No, sir, Mr. Horton is not  
20 asleep.

21 COMMISSIONER HORTON: That is true.

22 CHAIRMAN NOBLE: I'm sorry, no, ma'am.

23 BY MS. HERNBRODE:

24 Q. How did the floods that you describe affect  
25 the low flow channel?

1 A. The floods that I discussed and if we're  
2 referring -- are we referring to the large flood events  
3 in the early 1900s?

4 Q. Yes.

5 A. Okay. Those large flood events didn't just  
6 have an effect on the low flow channel. They had an  
7 effect on the entire channel, obviously, broadening that  
8 entire channel probably without question, moving the  
9 location of the low flow channel. I think the biggest  
10 difference that it had, Joy, was after that large flood  
11 event and over the period when the channel was  
12 recovering, if you will, back to a single braided  
13 channel, that there was probably multiple low flow  
14 channels and not just one. Eventually it led to one.

15 Q. Is it merely the size of the flood that  
16 affects channel change?

17 A. Every time you have a flood, particularly in a  
18 sand channel -- and I've observed this with the geologic  
19 record from the USGS -- there's scouring that goes on  
20 during a flood and that deepens the channel, and then  
21 over time it will come back. I know you wanted me to  
22 just give you a number, but it's kind of a continuum.  
23 You get certain events that will scour and change the  
24 channel, but there is -- the higher the flow is, the  
25 longer it's going to take for that channel to return to

1 what it looked like before the flood event, if that  
2 makes sense.

3 Q. So it is the size of the flood that affects  
4 how much it changes the channel?

5 A. I believe that's a major factor, yes.

6 Q. Could vegetation play a factor in channel  
7 change?

8 A. Yes.

9 Q. As a student of history, do you rely on  
10 newspaper articles in conducting your work and forming  
11 your opinion?

12 A. It's one of many lines of evidence, but yes.

13 Q. Let me double-check with my colleagues, but I  
14 think you may be free of me.

15 A. Okay.

16 Q. Okay. Thank you very much.

17 A. Thank you, Joy.

18 CHAIRMAN NOBLE: Mr. Katz, do you have  
19 anymore?

20 MR. KATZ: No, sir, I told you, I'd let the  
21 boss finish up.

22 CHAIRMAN NOBLE: We will take a break at this  
23 time, 15 minutes.

24 MR. HELM: I'd recommend you get coffee.

25 (Recessed from 2:44 p.m. to 3:01 p.m.)

1 CHAIRMAN NOBLE: Okay. There has been a  
2 little bit of discussion if we're going to be here after  
3 5:00.

4 VICE CHAIRMAN HENNESS: No.

5 MR. HELM: End of discussion?

6 CHAIRMAN NOBLE: And if Mr. Helm works really  
7 hard and impresses us with his ability to get right to  
8 the point, then we may not be here after 5:00.

9 However, I am somewhat reminded of the time  
10 the young man was out on a moonlit night with a young  
11 woman -- and probably someplace they shouldn't have  
12 been -- and he looks over at her and they talk about the  
13 hereafter, and he says, "If you're not here after what  
14 I'm here after, you're going to be here after I'm gone."

15 MR. HELM: I'll know it's time to stop for the  
16 day when I see you walk out.

17 VICE CHAIRMAN HENNESS: Sit down,  
18 Mr. Chairman. Let the record reflect that was me.

19 MR. HELM: Delete that from the record.

20 CHAIRMAN NOBLE: That's from about fifty years  
21 ago.

22 MR. MEHNERT: You told me to turn the tape on,  
23 and I did.

24 CHAIRMAN NOBLE: Go ahead.

25 MR. HELM: Am I ready to roll? All right.

1 CROSS-EXAMINATION

2 BY MR. HELM:

3 Q. Mr. Burtell, my name is John Helm, and I  
4 represent Maricopa County and the Maricopa County Flood  
5 Control District. Okay?

6 A. Good afternoon, Mr. Helm.

7 Q. I don't think we've ever had the pleasure of  
8 conducting one of these before in these matters, have  
9 we?

10 A. No.

11 Q. So I understand that you have testified a  
12 couple times before the Commission and provided reports;  
13 is that correct?

14 A. Yes.

15 Q. And those were on the San Pedro --

16 A. Yes.

17 Q. Those couple rivers? You've never done the  
18 Gila before?

19 A. No, San Pedro and the Santa Cruz.

20 Q. Okay. Nor have you done the Salt before?

21 A. No.

22 Q. I am sorry, since this is my first time up the  
23 flag pole, and I know I'm hurrying, but I have got to  
24 ask you a few questions about your CV.

25 A. Okay.

1 Q. Because I haven't had the pleasure of hearing  
2 your answers in the prior two meetings.

3 In the summary of your CV you identify  
4 yourself as an environmental scientist, correct?

5 A. That's correct.

6 Q. What's an environmental scientist?

7 A. As I meant to define it there, is someone with  
8 my background and experience who has dealt with  
9 hydrologic issues, geologic issues, also water quality  
10 or geochemical issues. It's a grab bag term. Perhaps I  
11 could be more specific.

12 Q. Not one that they offer a degree in at your  
13 university?

14 A. My degrees are in geology and hydrology.

15 Q. In terms of the 25 years that you have been an  
16 environmental scientist, have you ever made a  
17 determination of whether a river or a stream should be  
18 segmented for navigability other than the determinations  
19 you've made in this case or the two prior ones that you  
20 participated in?

21 A. No.

22 Q. During the 25 years that you've been an  
23 environmental scientist, have you ever made a  
24 determination of whether a river or a part of a river  
25 was navigable that was not done for ANSAC?

1 A. No.

2 Q. During the 25 years that you've been an  
3 environmental scientist, have you ever made a  
4 determination what the natural flow of a river or a  
5 stream was that was not done for ANSAC?

6 A. Yes.

7 Q. Could you give me the particulars, names of  
8 the rivers you've made these determinations on?

9 A. Among my other duties, at least in Arizona,  
10 was I was the co-manager of the Arizona Water Atlas; and  
11 we evaluated, among other things in that atlas, the  
12 seasonal and annual flows for all of the major  
13 watercourses in Arizona, at least.

14 Q. And I probably constructed that question a  
15 little poorly.

16 A. Okay.

17 Q. In the Arizona Atlas, did you do that in terms  
18 of natural and ordinary flows?

19 A. That was using USGS stream flow records.

20 Q. So it wasn't using the same standards that we  
21 use here at ANSAC to determine flow under the case law  
22 that we've got?

23 A. Some of those streams that we tabulated, I  
24 think, upon looking at their records might have minimal  
25 diversions. And so those stream flows could be

1 considered ordinary and natural. Others of them  
2 certainly have been affected by diversion. So it would  
3 be both.

4 Q. Okay. During your 25 years as an  
5 environmental scientist, have you ever made a  
6 determination what the natural flow of a river or stream  
7 was that was not done for ANSAC? And in that question,  
8 I'm using the term natural to be one-half of natural and  
9 ordinary.

10 A. I certainly evaluated, when I was with the  
11 Department of Water Resources, we looked at -- I was the  
12 head of the adjudication section, and I certainly won't  
13 bore the Commission with this. But to answer your  
14 question, part of the determination of subflow in  
15 Arizona requires one to look at pre-development stream  
16 flow conditions as ordered by the Gila River  
17 Adjudication Court, not to be confused with the  
18 Navigable Stream Commission.

19 So pre-development stream flow conditions in  
20 that setting is similar to this insofar as you're trying  
21 to characterize the flow in the river prior to the  
22 effects of man's diversions.

23 Q. How long ago did you participate in those  
24 hearings?

25 A. Those hearings occurred during my stay at DWR,

1 which was for about 11 years, and they continue to this  
2 day.

3 Q. I understand they continue to this day.

4 A. Okay.

5 Q. Can you put dates on the time you played?

6 A. Oh, I started with DWR in dealing with subflow  
7 issues, I would say 2000, 2001, and that continued until  
8 I left DWR in 2011. So ten years.

9 Q. And as you said, that adjudication is  
10 particularly concerned with subflow issues, correct?

11 A. To answer your question, the question was  
12 whether I dealt with flows in ordinary -- I think the  
13 question was ordinary and natural flows as part of --

14 Q. No, you got to stay on the question I'm on or  
15 we're going to really be here for four days.

16 A. Okay. Just trying to --

17 Q. The question I asked you was whether that  
18 Commission deals primarily with subflow issues?

19 A. That adjudication, I should say, deals with a  
20 lot of issues. Subflow is one of them.

21 Q. In terms of your employment portion of the CV,  
22 other than ANSAC, what experience have you had in  
23 determining navigability under the ordinary and natural  
24 conditions as that terminology is used for these  
25 proceedings?

1 A. These proceedings are the first case where I  
2 have been asked to, let's say, apply the Daniel Ball  
3 Test.

4 Q. Have you read PPL Montana?

5 A. I have.

6 Q. And have you read Winkleman versus ANSAC?

7 A. I have.

8 Q. Have you read Defenders of Wildlife versus  
9 Hull?

10 A. You know, I heard the testimony yesterday, and  
11 I was trying to remember if I read that. I focused on  
12 the two first cases. It's not -- I don't recall if I've  
13 read Defenders, but I certainly read the first two cases  
14 you mentioned.

15 Q. I would recommend it to you.

16 A. Okay.

17 Q. Now, you've testified that you considered the  
18 Gila River or the upper Gila River on a segment by  
19 segment basis, correct?

20 A. That's correct.

21 Q. You haven't done that for any other portion of  
22 the river, correct?

23 A. That's correct.

24 Q. And that determination of the three segments  
25 was based on various physical conditions that you

1 determined, correct?

2 A. That's correct.

3 Q. Now, we're told in Winkleman to look at the  
4 river in its ordinary condition and its natural  
5 condition. Do you recall that?

6 A. I do.

7 Q. And the case made the point that those are  
8 separate determinations. Correct?

9 A. The case says you need to look at one and the  
10 other. So whether they're separate or not, I don't  
11 know. But you have to look at both of them, so --

12 Q. I think it would be quicker if I showed you  
13 this than me reading it to you, and then maybe we could  
14 have that discussion of whether you have to consider  
15 them together or apart.

16 A. Okay.

17 Q. And I would suggest that you commence reading  
18 about right there.

19 A. So start reading where it says --

20 Q. Just go ahead and read it to yourself.

21 A. Oh, read it to myself. Okay.

22 MS. HACHTEL: Mr. Helm, would you let the  
23 record reflect what you gave him?

24 MR. HELM: Winkleman.

25 MS. HACHTEL: Thank you.

1 CHAIRMAN NOBLE: Did you get that, Gary?

2 THE REPORTER: Yes.

3 THE WITNESS: Should I stop here at 28 or keep  
4 going?

5 BY MR. HELM:

6 Q. Go ahead for the rest of the yellow  
7 underlining.

8 Now, in this case, they separately define  
9 "ordinary," don't they, the Court being "they"?

10 A. Yes, there's separate, separate definitions  
11 for natural versus ordinary.

12 Q. And at least as I read this, I understand it  
13 to be a direction to the Commission to evaluate the  
14 river in each one of those definitional categories,  
15 fair?

16 A. Fair.

17 Q. Okay. Did you do that?

18 A. I certainly tried to. Yes.

19 Q. Did you do that in terms of me being able to  
20 look at your report and say, ah-ha, there's the section  
21 on natural?

22 A. When it came to natural, I would refer to the  
23 reader where I tried to reconstruct flows, at least as  
24 one area of natural, where I tried to reconstruct the  
25 flows absent any diversions, which is, my understanding

1 is generally how they define natural.

2 Also in my report, as I discussed this  
3 morning, I compiled historic accounts, and those  
4 historic accounts were at a time when, based on my  
5 knowledge and information, diversions were either absent  
6 or minimal. So that would also be considered natural.  
7 The needs for navigation in the area, I also looked at  
8 times when the quantities of water being diverted were  
9 either nonexistent or minor, so that would also be  
10 considered natural.

11 CHAIRMAN NOBLE: Mr. Sparks.

12 MR. SPARKS: Excuse me, Counsel, but for this  
13 to have any meaning in the record, we need to have  
14 whatever you're referring to as a case identified for  
15 the record.

16 MR. HELM: I did that once, but I would be  
17 happy to do it again for you. I realize you have a  
18 hearing problem.

19 MR. SPARKS: Yeah, I also have one where you  
20 don't use any words to describe what you just did. So  
21 if you could use the words to describe the case and the  
22 citation, that would be most illuminating.

23 MR. HELM: Do you know what Winkleman is?

24 MR. SPARKS: Yeah, it's a town down on the  
25 Gila.

1 MR. HELM: So you want me to tell you it's  
2 State, ex rel. Winkleman?

3 MR. SPARKS: Yeah, and all the rest of it that  
4 goes with that.

5 MR. HELM: Okay. Versus the Navigable Stream  
6 Adjudication Committee. Got it?

7 MR. SPARKS: I can probably keep up if you  
8 just put it in the record.

9 MR. HELM: I thought I did it once over there  
10 when I was standing there. You probably didn't hear it.

11 MR. SPARKS: Yeah. But no, you didn't, but --  
12 BY MR. HELM:

13 Q. Now, as I get it, there's no specific  
14 identification in your report for an area that is  
15 defined as, all right, now I'm going to do the natural  
16 reconstruction of the river. We have to take that out  
17 from your conversation about reconstruction in general?

18 A. I disagree. I feel that my report does make  
19 it clear that I am specifically trying to reconstruct  
20 flows to evaluate what they would have been absent any  
21 diversions. So I used that phrase or paraphrasing  
22 absent any diversions and that, as I also describe in  
23 the report and you just described, that is what  
24 Winkleman and maybe, apparently, Defenders also  
25 indicates is natural.

1 Q. Second question tied to that is, where is the  
2 ordinary section?

3 A. The ordinary section is related to looking at  
4 flow records that are in periods when there weren't  
5 droughts or floods. And where I address that or  
6 attempted to address that, and I believe I have language  
7 in there, is twofold or two places. The use of median  
8 flows, I discuss in my report, is particularly relevant  
9 insofar as it minimizes the effect of very high flows.

10 Also, in my reconstruction, I presented tree  
11 ring reconstructions, and I believe I testified this  
12 morning that I did that not only to pick years when it  
13 wasn't a very wet period, but also to pick years when it  
14 wasn't unusually dry. So it was my attempt, and I state  
15 in the report that my flow reconstruction was during a  
16 decade when there was about an equal number of flows  
17 above the long-term median and about an equal number  
18 below. And that there weren't extreme highs and lows  
19 during that period.

20 Q. Would you define for me what the natural and  
21 ordinary condition of the river was on the date of  
22 statehood, as you understand it?

23 A. The natural and ordinary condition as of  
24 statehood is, as all the experts have struggled with,  
25 and I will try to keep this brief. Because at the time

1 of statehood the flow conditions were no longer in their  
2 natural state, at least in the segments that I looked  
3 at, that on statehood, if you were simply looking at the  
4 flows, the actual flows at that time, it wasn't in its  
5 natural condition at statehood with respect to flows.

6 Q. That tells me what it was, and I want to know  
7 what it is. What was it on the date of statehood?  
8 You've just told me it's not natural, for lack of a  
9 better description. I want to know your definition of  
10 what it was.

11 A. If I'm understanding what you're asking then,  
12 if you could somehow at statehood look at the river as  
13 if there were not diversions at that time. So this is a  
14 bit of a hypothetical. Then I tried to characterize  
15 that with my flow reconstruction. And so then to answer  
16 your question, at statehood I considered the natural and  
17 ordinary conditions of that river to be a nonnavigable  
18 stream; and my flow reconstruction is, I believe, a high  
19 estimate of what the stream flow, the volumes, the  
20 depths, and the velocities would have been at that time.

21 Q. What about the shape of the channel, that sort  
22 of stuff?

23 A. The shape of the channel is a little  
24 different, in my opinion, with respect to natural and  
25 ordinary versus the flow. At statehood, I believe that

1 the channel was in its natural condition. It had just  
2 gone through a flood event a few years prior, and in the  
3 upper -- the segments that I looked at, A, B, and C or  
4 Mr. Fuller's 1, 2, and 3, it was braided in two of those  
5 segments, Segments 1 -- his Segment 1, my Segment A and  
6 my Segment C. So in its natural and ordinary condition  
7 at -- I believe that that's how the channel looked with  
8 the Gila Box being not braided.

9 Q. Okay. And just let me clarify one thing. I  
10 don't want to take you out of that area that you've  
11 studied.

12 A. Okay.

13 Q. So my questions, and I know I get sloppy and  
14 ask just about the condition of the Gila River. But  
15 what I intended them to be was questions about the Gila  
16 River in the area you studied.

17 A. Understood.

18 Q. And would your answer change in any respect  
19 since I've now clarified that issue?

20 A. Would the answer to what question change?

21 Q. All of the ones that I've asked you so far  
22 where I just mentioned the wording "the Gila River."  
23 For example, I asked you about the natural condition of  
24 the Gila River.

25 A. The issue about natural and the diversions

1 would -- my answer would be the same. On the subsequent  
2 or lower segments --

3 Q. No, no, it's just the reverse. I'm trying to  
4 tell you that I was getting sloppy, and instead of  
5 saying the upper Gila River or your portion of the Gila  
6 River that you studied, I just referred to it as the  
7 Gila River, and I apologize to you for doing that. And  
8 I don't want to take you out of the areas that you've  
9 studied.

10 A. Got you.

11 Q. So is it fair to say that the answers you've  
12 given so far where I used that unfortunate terminology  
13 all stand for the upper Gila River?

14 A. Your questions as applied to the upper, I  
15 would not change how I responded.

16 Q. Very good.

17 A. Okay.

18 Q. Thank you. I apologize.

19 A. No, you're fine.

20 Q. Now, on the portions that you evaluated, did  
21 you make a determination of whether any of those could  
22 have served in their natural and ordinary condition as a  
23 highway for boats?

24 A. Yes.

25 Q. And what were those determinations?

1 A. I determined in my declaration or came to the  
2 conclusion in my declaration that none of the three  
3 segments that I evaluated would have served as a highway  
4 for commerce for boats in their natural and ordinary  
5 condition on or before statehood.

6 Q. Okay. You continually add a qualifier I've  
7 noticed in your prior testimony, here again in your  
8 answer to this question. I asked you highway for boats,  
9 and you replied highway for commerce boats. And what's  
10 your -- is your answer the same if we're just going to  
11 tell me that it's boats?

12 A. I think, I haven't heard that phrase highway  
13 for boats used before, but I would say that --

14 Q. You understand what the terms mean, don't you?

15 A. I certainly know what the phrase highway means  
16 or I think I know what it means, and I've just never  
17 heard the phrase highway for boats, but I think I  
18 understand where you might be going with that. I would  
19 not characterize any of the three segments that I looked  
20 at as a highway for boats.

21 Q. In any condition?

22 A. In the natural and ordinary condition that I  
23 looked at.

24 Q. In any condition. Next question -- do you  
25 want me to repeat the whole thing?

1 A. No, no, I understand. There could be  
2 conditions -- you know, under the highest flows, I'm not  
3 sure I'd want to be out there with a boat. So I'm going  
4 to say, I'm going to say under any conditions, yes.

5 Q. Even the condition -- it doesn't stick in my  
6 head where, but somewhere I think in your report, you  
7 talked about times of the year when we would have  
8 greater flows than what were reflected in, was it  
9 Exhibit 10?

10 A. Table 10 has monthly flow data.

11 Q. Yeah. But you would have -- in some months it  
12 would be greater than the "less than" number that you  
13 had come up with, i.e., I'm thinking of the summer  
14 monsoon season and was it March and April or some period  
15 of time in the spring?

16 A. My Table 10 reflects that the flows are  
17 variable on a monthly basis, the median flows, and then  
18 associated with those are depths, and those depths  
19 change.

20 What I did find, and when you look at that  
21 table, is that even when you get an increase in flow,  
22 you don't necessarily get a -- necessarily a very large  
23 increase in depth. That's driven by the channel  
24 geometry.

25 Q. Two controls, the base and the sides?

1 A. That's correct.

2 Q. If the sides don't move and they're taller  
3 than the flow before the increase starts, you will get  
4 an increase in depth, won't you?

5 A. What I found is that there are times of the  
6 year, times of the year when the USGS was out in the  
7 field that the channel had a certain characteristic  
8 where that might apply, and then it had times when it  
9 didn't. If I took anything away from those rating  
10 curves, it is just how variable these channels are over  
11 time. So there are times when what you said I would  
12 agree with, and then there's lots of times I would say I  
13 would not agree with that.

14 Q. Then give me an example of -- my example was  
15 very simple. If the sides don't change because they  
16 were tall enough, then the height of the water surface  
17 will, or the depth, put another way, will increase as  
18 the flow goes up, correct?

19 A. Under that hypothetical, I would agree, yes.

20 Q. Okay. And we'll probably go along quicker if  
21 you'll answer my crazy hypotheticals no matter what they  
22 might be, than trying to figure out where I'm going with  
23 it, okay?

24 A. Oh, Mr. Helm, when I ask about a hypothetical,  
25 I'm simply trying to understand exactly what you're

1 asking. So I mean no disrespect. I'm just trying to  
2 understand and answer the right question.

3 Q. Believe me, I've been doing this for almost  
4 fifty years, and I have been disrespected by --

5 CHAIRMAN NOBLE: The best.

6 Q. -- the best, and I don't take any offense. I  
7 don't get excited about it any more than I normally get  
8 excited.

9 A. Fair enough.

10 Q. Please feel free to disrespect me all to heck.

11 A. Okay.

12 Q. Now, am I understanding you right that you  
13 have a quote, unquote, commerce component that you  
14 require to find a river navigable?

15 A. Yes.

16 Q. Okay. Did you do any studies to determine  
17 whether a boat could move through any of the three  
18 sections that you looked at, and with this I'd say  
19 except the three newspaper accounts you looked at, if it  
20 wasn't involved in commerce?

21 A. I looked at a lot more than three newspaper  
22 articles, certainly, and I think a lot more than that.  
23 But to answer your question, if I --

24 Q. I would appreciate that.

25 A. Well, can you, can you rephrase -- can you

1 state the question? I'm trying to understand exactly  
2 what you're asking again.

3 MR. HELM: Would you read it back to him,  
4 please?

5 (The question was read by the Certified.  
6 Reporter as follows: "Did you do any studies  
7 to determine whether a boat could move through  
8 any of the three sections that you looked at,  
9 and with this I would say except the three  
10 newspaper accounts you looked at, if it wasn't  
11 involved in commerce?")

12 BY MR. HELM:

13 Q. Do you understand what I'm driving at?

14 A. I think I do. And so let me try to answer it.

15 Q. Study without commerce?

16 A. Study without commerce. I tried to, by  
17 reconstructing the flows, in particular, tried to  
18 evaluate how much flow were in my three segments, the  
19 segments that I looked at in their natural and ordinary  
20 condition as a tool then to interpret whether or not  
21 boats that were customarily in use at the time could  
22 have utilized those rivers. So I didn't anywhere, I  
23 think, use the phrase "commerce."

24 Q. We'll argue about that later. I'm not here to  
25 argue whether you used the phrase. I thought I heard

1 you use that. But at any rate --

2 A. Okay.

3 Q. -- generally speaking, your standard for  
4 navigability, as I said, includes a commerce component,  
5 correct?

6 A. Yes.

7 Q. Okay. So what I'm trying to drive at is, did  
8 you do any studies to determine whether boats could move  
9 through the areas you studied that excluded the commerce  
10 component as part of the study?

11 A. Among other things, in my boating section, I  
12 looked at the recreational boating through the Gila Box  
13 area that I think would fall under that category.

14 Q. Okay. And when you say you looked at it, what  
15 did you do to make a determination whether recreational  
16 boats could pass through the Gila Box?

17 A. What I looked at was a combination of  
18 references that were in Mr. Fuller's reports,  
19 supplemented by more recent research, primarily online,  
20 related to folks that have described what type of  
21 conditions are most conducive to recreational boating in  
22 that area.

23 Q. And your conclusion was?

24 A. My conclusion, and it's one of the paragraphs  
25 in my report, that there certainly are times of the year

1 that the Gila Box is conducive to recreational boating.

2 Q. Are there times of the year, for instance,  
3 when we talked about the floods or the spring runoff and  
4 the summer monsoons when the other two sections would be  
5 conducive to recreational boating?

6 A. I don't know -- I think I put it in my report  
7 that some people during the higher flow in the spring,  
8 March and April, do in fact float the segment. They  
9 start in New Mexico and flow through the Duncan/Virden  
10 Valley area before they hit Gila Box. Based on my  
11 review of existing documents, and again more current  
12 online research, for various reasons, I think Mr. Fuller  
13 described, there doesn't seem to be a very active use of  
14 what I refer to as Segment C through Safford Valley for  
15 recreational boating. So I looked at that.

16 Q. Is the depth of water that you need to  
17 recreationally boat different in your mind than the  
18 depth of water you need to conduct commercial boating?

19 A. Yes.

20 Q. What's the difference?

21 A. Based on, and actually it's in my report, the  
22 amount of water that, at least with respect to Gila Box,  
23 that outfitters talk about can be used commercially; if  
24 you're going to have a rubber raft and float through  
25 Gila Box, those flows are higher than the same river

1 course that you could use a personal kayak or canoe  
2 where those flows are lower. And I believe I, in my  
3 declaration, I talk about what those different flows  
4 are.

5 Q. Okay. So if I understand what you just said,  
6 your standard for commercial would be a guide troop or  
7 group, crew, what have you, who conducts trips for  
8 multi-persons in one boat?

9 A. I would say that certainly is a type of  
10 commercial use of the river, that is correct.

11 Q. Would I qualify if I had 20 recreational  
12 canoes and rented them out to 20 people to go through  
13 any of your segments?

14 A. I think that's a hypothetical. Under those  
15 circumstances, if you were able to successfully do that  
16 more than just once, and do it in a way that it was a  
17 useful or reliable means of you making money by doing  
18 that, I'd have to contend that that's true.

19 Q. Okay. So it doesn't have anything to do with  
20 the boat I'm using or the person I'm taking down the  
21 river. It's simply a question of am I making money at  
22 whatever enterprise I intend to do on that portion of  
23 the river. Have I got that right?

24 A. Well, the problem we're now getting into  
25 though is the type of boats that you might be using in

1 this setting that you just have described are now  
2 getting different, in my opinion, at least, of what  
3 boats might be customarily in use at the time of  
4 statehood, which I do believe is something one has to  
5 look at.

6 Q. Okay. We'll get to that. I promise you.

7 A. Okay.

8 Q. I'm just trying to get the parameters of your  
9 commercial use --

10 A. Okay.

11 Q. -- definition. And right at this point,  
12 whether it be at statehood -- I assume it would be the  
13 same vis-à-vis the commerce issue; and if the commerce  
14 issue is just simply tied to am I making money with  
15 whatever I do with whatever the kind of boat it is, that  
16 has just qualified as a commercial use for purposes of  
17 determining whether the stream is navigable or not,  
18 true?

19 A. I think there needs to -- when you say making  
20 money in your hypothetical, is that commercial  
21 enterprise done in a -- is it more than one event? Have  
22 you established a business on the river? I guess that's  
23 what I'm trying to understand.

24 Q. Let's say I establish a business in downtown  
25 Safford. You come by, pick up the canoe, and go where

1 you want to go.

2 A. I would say that, again, leading commercial  
3 trips through the Gila Box, in itself, is not  
4 necessarily a commercial enterprise that would stand up  
5 to Daniel Ball unless the type of boats that were being  
6 used at that time are primarily similar to what would  
7 have been available at statehood; and the type of boats  
8 that are being used commercially through Gila Box were  
9 not available at statehood. At least that's my opinion.

10 Q. Sure. I understand it's your opinion, and you  
11 understand that Mr. Fuller has a different opinion.

12 A. Yes.

13 Q. Okay. And we will allow the Commission to  
14 fight that one out at a later date.

15 A. Yes.

16 Q. But that wasn't my question.

17 A. Okay.

18 Q. As I understood what your definition of  
19 commerce was, if I'm renting boats in downtown Safford  
20 to people who want to go recreating on the river, and I  
21 am making a profit doing that, I'm advertising the cost  
22 of the boats, and people are coming in and renting a  
23 boat, that would qualify that boat as a test for  
24 commerce if whoever rented it from me made it through  
25 whatever stretch of the river he was putting it on?

1 A. I don't agree that that would be enough to  
2 establish that that reach was navigable.

3 Q. Okay. Well, why did you -- I forget the name  
4 of the place in downtown -- wherever it was -- that was  
5 renting boats. Why did you call them up to find out  
6 whether they were doing that on a commercial basis?

7 A. Oh, I was simply looking at the frequency of  
8 use of the river.

9 Q. So it had nothing to do whether they were,  
10 there was a commerce element engaged by that store that  
11 might classify the river as navigable?

12 A. Again, it is -- that in itself would be the  
13 only determination. I feel that that's a factor that  
14 could be looked at and considered, but certainly not the  
15 only factor.

16 Q. Well, I didn't say it was the only factor.

17 A. Okay.

18 Q. I said it's one of the factors that you used  
19 to make your navigability determination, correct?

20 A. Yes, it's one of the factors that I looked at,  
21 yes.

22 Q. Boat rentals, and I forget the name of the  
23 town, but somewhere --

24 A. I think it was Thatcher.

25 Q. Okay. Somewhere up in that area?

1 A. Yes.

2 Q. Now, I believe that you testified to earlier  
3 that you thought the trade and travel component of the  
4 definition was conjoined with the word "and," and that  
5 that meant that it had to be both trade and travel if we  
6 were going to classify a river as navigable?

7 A. Yes.

8 Q. And I believe you told me that you were  
9 relying on PPL for that?

10 A. That's correct.

11 Q. I will admit that PPL contains the words  
12 "trade and travel." But that case did not involve an  
13 issue of whether trade and travel had to be conjoined,  
14 did it?

15 A. I don't know.

16 Q. Okay. You're not a lawyer or never went to  
17 law school or any of that kind of stuff, are you?

18 A. No.

19 Q. Don't claim to be an expert in law?

20 A. No.

21 Q. Don't even claim to be an expert in how to  
22 interpret PPL?

23 A. I think as a hydrologist being asked to  
24 evaluate navigability, that as I indicated in my  
25 declaration, I read those cases and tried my best to

1 provide the Commission evidence that they could use to  
2 interpret that.

3 Q. Now, I think you testified that you don't  
4 recall whether you read Defenders or not?

5 A. That's right. And I just can't recall.

6 MR. HELM: Well, I want to make sure I do this  
7 right. It's Defenders of Wildlife v. Hull.

8 MR. SPARKS: Do you want to give us the  
9 citation?

10 MR. HELM: I'd be happy to. 199 Ariz. 411.

11 MR. SPARKS: You're doing better.

12 MR. HELM: Thank you.

13 BY MR. HELM:

14 Q. I'm going to show you the Defenders of  
15 Wildlife case, and I would like you to read what I have  
16 underlined with my trusty little blue ballpoint pen, and  
17 you can read this one out loud.

18 A. You want me to read it out loud or I can --

19 Q. Go ahead and read it out loud.

20 A. Okay. What you have underlined says, "The  
21 federal test has been interpreted to neither require  
22 both trade and travel together nor that the travel or  
23 trade be commercial." That's what you underlined.

24 Q. And your understanding is different than  
25 what's stated in Defenders, correct?

1 A. Mr. Helm, when I prepared my declaration -- I  
2 think it's one of my earlier bullets -- I indicated the  
3 documents that I reviewed to base my determination on,  
4 and it was, at least the two cases that I specifically  
5 cite, are Winkleman and PPL Montana, but it did not  
6 include Defenders.

7 Q. That's correct. But that's not what I asked  
8 you. We need to be responsive.

9 A. I'm trying.

10 Q. Okay. What I asked you is your understanding  
11 of what you just read here and PPL's requirements are  
12 different?

13 A. I'm not as -- not a -- as a nonlawyer, I'm not  
14 going to try to figure out the legal differences between  
15 one or the other. I'll just say what I did, and that is  
16 I looked at PPL Montana.

17 Q. Okay. And you don't know who's right, do you?

18 A. No. Well, no, let me rephrase that. I am  
19 under the assumption that PPL Montana and Winkleman are  
20 the cases that I should be viewing in preparation of my  
21 declaration.

22 Q. And if in your interpretation they conflict,  
23 which one controls?

24 A. Boy, I kind of get the sense that's a legal  
25 question. I'm not a lawyer, Mr. Helm. I don't know

1 which one legally would -- again, I was instructed to,  
2 or my understanding when this case got remanded is that  
3 it was to be remanded in light of viewing those two  
4 cases, and those are the cases that I looked at.

5 Q. Okay. Well, did you view trade and travel as  
6 two separate elements or as a combined requirement when  
7 you were making your navigability determination this  
8 time around?

9 A. Well, quite frankly, even though I did assume  
10 that it was an "and," I don't think if it was an "or,"  
11 my conclusions would have changed.

12 Q. How about the part that says and it doesn't  
13 have to be commercial?

14 CHAIRMAN NOBLE: Excuse me, Mr. Helm, are you  
15 asking him about a case he did not rely on?

16 MR. HELM: No, I'm asking him if it was  
17 correct, would his opinion change?

18 CHAIRMAN NOBLE: Okay. But you're asking him  
19 about the holding in Defenders.

20 MR. HELM: That's correct.

21 CHAIRMAN NOBLE: And he's told you he didn't  
22 rely on Defenders.

23 MR. HELM: If that's what he's told me, if  
24 that's what the Commission understands it and that's  
25 what will stand on the record, I will be happy to stop,

1 because that's what I'm trying to get him to admit.

2 CHAIRMAN NOBLE: I think he said he doesn't  
3 recall reading it, and that he relied on Winkleman and  
4 PPL. So can we move on?

5 MR. HELM: Oh, we absolutely can.

6 CHAIRMAN NOBLE: Thank you.

7 MR. HELM: We'll forget about Defenders and  
8 everything it says.

9 CHAIRMAN NOBLE: No, we're not going to forget  
10 about it. This witness does not rely on it.

11 MR. HELM: With him. With him, I mean. So if  
12 anything he did is a no-no under Defenders, we'll just  
13 deal with that when I get a chance to write a brief.

14 CHAIRMAN NOBLE: You're on the record.

15 MR. HELM: Okay.

16 CHAIRMAN NOBLE: Let's move on.

17 BY MR. HELM:

18 Q. We've talked about the three segments, but I  
19 recall a couple of times when you kind of went outside  
20 the box of your three segments; for example, when you  
21 were talking about the fellow from California and the  
22 book you found that you snuck in on us. Right?

23 A. When you refer to the book that I -- or the  
24 account that I snuck in on you, was that one of the  
25 pieces of evidence that Mr. Hood introduced? I'm trying

1 to make sure.

2 Q. Langerfeld, was that the guy's name?

3 MR. HOOD: He's talking about the Lingenfelter  
4 book that's been in the record for years now, Rich.

5 THE WITNESS: Oh, okay. Can you repeat the  
6 question then?

7 BY MR. HELM:

8 Q. Sure. We were talking about other segments of  
9 the Gila River that you had commented on in passing, and  
10 my recollection was one of those with the fellow who  
11 wrote the book and filed the affidavit named Langerfeld.  
12 I may not have his name right, but close enough for  
13 government work, I hope. And he was looking at  
14 steamboats down on the Colorado for the most part,  
15 wasn't he?

16 A. He was looking at boat traffic on the Colorado  
17 River and its tributaries.

18 Q. Okay. This is all secondhand to the extent  
19 that you testified to a lot of conversations you had  
20 with that fellow, right?

21 A. I think Mr. -- or Dr. Lingenfelter's  
22 declaration, affidavit, I believe is what it is, speaks  
23 for itself.

24 Q. Okay. And did you take that declaration and  
25 simply apply what that declaration says to the three

1 segments that you were evaluating, or are you using that  
2 declaration to render an opinion as to the entire Gila  
3 River?

4 A. My focus in my report, as you know, is those  
5 first three segments, and I guess we're now in the range  
6 of you asking me something more than just my study area?

7 Q. Well, I got the impression that -- I got the  
8 impression that Dr. Langerfelt did not study your study  
9 area?

10 A. No, Dr. Lingenfelter commented, if one reviews  
11 his affidavit, of the practicability of commercial boat  
12 travel along the Gila River in its entirety.

13 Q. Okay.

14 A. And he discussed both, specifically the  
15 portion that I did look at. I believe that's one of the  
16 sections of his affidavit.

17 Q. All right. What I'm trying to find out is,  
18 did you use it for anything more than determinations  
19 that you made on your three segments?

20 A. No.

21 Q. And you're not here giving us an opinion on  
22 the viability of navigability on the middle Gila or the  
23 lower Gila, are you?

24 A. That's not what I was asked to do, no.

25 Q. And you're not here doing that, even if you

1 weren't asked, right?

2 A. That's correct.

3 Q. Okay. And so from the Commission's  
4 standpoint, they should view both your testimony and  
5 your report as opinions that attach to those three  
6 segments that you did review?

7 A. That's what I presented, yes.

8 Q. In Paragraph 8 of your report, you state that  
9 braided channel navigation is unreliable because -- due  
10 to their relatively shallow water depth and unstable  
11 cross section. Fair enough?

12 A. Yes, I stated that in Paragraph 8.

13 Q. Okay. And are you telling me that you can't  
14 navigate or it's very difficult to navigate a braided  
15 river regardless of the amount of water available to it?

16 A. No. What I mean to be saying here is the Gila  
17 River in Arizona at the times that it was braided, in my  
18 opinion, would have been in those -- would have been  
19 unreliable.

20 Q. Okay. So this statement is limited to the,  
21 once again, the three sections of the Gila up in your  
22 area, and you're saying it's unreliable because it  
23 doesn't have enough depth in it in a braided condition?

24 A. Yes, as it applies to my three segments,  
25 correct.

1 Q. And you categorize it as relatively shallow  
2 water depth, I think is the terminology you used?

3 A. That's the words I use, yes.

4 Q. Would you define for me specifically what the  
5 upper limit of shallow, relatively shallow depth is or  
6 whatever that terminology is exactly?

7 A. Probably the closest I can get you to a number  
8 is that it would be further below my reconstructed  
9 flows. Because my reconstructed flows, as you might  
10 recall my testimony this morning, was for a single  
11 channel. So it would be relatively less than what I  
12 reconstructed.

13 Q. Relative to what? Your study?

14 A. Yeah -- I'm trying to understand. Yes, I  
15 guess, if I'm trying to understand what your question  
16 is, under a braided condition, my opinion is that the  
17 flows that I reconstructed, if that same flow was put  
18 through a braided channel, that it would be less. The  
19 associated depths of flow would be less.

20 Q. Do we know how less?

21 A. I didn't do that analysis.

22 Q. Okay. And it doesn't matter from your  
23 perspective because at the flows you constructed, your  
24 opinion is it's not navigable anyway?

25 A. That's correct.

1 Q. It just gets more not navigable, so to speak?

2 A. So to speak.

3 Q. In Section 9 you state that you found the  
4 upper Gila was not used for trade or travel, correct?

5 A. I'm sorry, Section 9 or Paragraph 9?

6 Q. Paragraph 9, I'm sorry.

7 A. Oh, I'm sorry. Can I read that paragraph,  
8 please?

9 Q. Certainly.

10 A. As you might note in my Paragraph 9, I say it  
11 was neither used for trade or travel. So in that case,  
12 the conjunctive whether it's an "and" or an "or" would  
13 not apply. I'm saying under either case.

14 Q. That's fine, because the first case I only  
15 wanted you to define the word "trade" that you use  
16 there.

17 A. What I meant by trade in Section 4, and I  
18 don't mean -- let me look at Section 4. Section 4 was  
19 my, as you understand, is my historic accounts as well  
20 as a photograph, and that's the two subsections in  
21 Section 4.

22 It was based on those historic accounts. I  
23 did not find in evidence the travelers that were going  
24 through the study area I looked at at a time when I felt  
25 that cultural diversions were either nonexistent or

1 minimal utilized the river for travel purposes.

2 Q. But my question was, please define trade for  
3 me.

4 A. Oh, I'm sorry, trade. I thought you said  
5 travel. I apologize. Trade, as I understand, would be  
6 the use of -- are you asking for just the definition of  
7 trade by itself or on the watercourse? I'm sorry.

8 Q. I want to know your definition of trade as you  
9 used it in this sentence in Paragraph 9.

10 A. Okay. I view trade as an exchange of goods or  
11 services, either in a public or a private setting. That  
12 is, you could also have a situation where someone is not  
13 running a commercial steamboat, if you will, offering  
14 public rides; but also using a boat, let's say,  
15 privately to again exchange goods and services.

16 Q. And the definition that you've just given us,  
17 would that also be applicable for all of the other parts  
18 of your report where you use the term "trade"?

19 A. I believe so, yes.

20 Q. You're not aware of anywhere you changed out  
21 the definition?

22 A. No.

23 Q. And now could we do the same thing for the  
24 word "travel"?

25 A. Again, my definition of travel perhaps is a

1 bit different than -- and again, I don't want to put  
2 words in Mr. Fuller's mouth, but I got the impression  
3 from his presentation that the use of a boat on a  
4 watercourse for personal recreation would satisfy the  
5 travel part of the Daniel Ball Test.

6 My interpretation of travel is different than  
7 that. I view, I view travel having to have some type of  
8 a commercial reality. That is, someone who is using a  
9 watercourse just for their private purpose of maybe to  
10 hunt or fish or to float, I don't view that as a  
11 commercial use or travel as defined by Daniel Ball.

12 For better or for worse, I have to consider in  
13 my opinion the commerce part of the definition, and so  
14 when I view travel in light of Daniel Ball, I have to  
15 consider travel for a commercial purpose.

16 Q. And that's the definition that you used  
17 throughout your report when you talk of travel?

18 A. Yes.

19 Q. I'm having a little trouble with Section 9,  
20 and the problem is maybe just an English thing, and  
21 where I come from I don't have very good English.

22 A. Sorry, Mr. Helm, Paragraph 9 or Section 9?

23 Q. I'm sorry, Paragraph 9, starts out Section 4.  
24 You state, and I think you're describing Section 4.

25 A. That's correct.

1 Q. The transportation needs of the first settlers  
2 in the region are discussed next in Section 5, and it is  
3 found that the upper Gila River was neither used for  
4 trade or travel.

5 And my simple question there, are you telling  
6 me with that statement that nobody ever used a boat in  
7 Section 5, I think, which was historic?

8 A. Section 5 is where I actually talk about the  
9 needs of settlers in the area to have navigation.

10 Q. But my question is simply, are you telling me  
11 that none of those settlers ever used a boat on those  
12 three segments of the river?

13 A. The evidence that I have as to the use of  
14 boats on that river are summarized in that table, and I  
15 can describe what those are. But there were three  
16 accounts of boat use and one account of a military raft  
17 to cross the river. Those are the only three accounts  
18 that I'm aware of in the area I looked at.

19 Q. How many settlers -- well, wait a minute.  
20 Let's back up for a minute. Define for me what you mean  
21 by settlers. Somebody came along, built a log cabin  
22 next to the river so they could get water and started  
23 agriculture?

24 A. I think the phrase "settler" is probably --  
25 could be defined rather broadly to include, in this

1 situation, at least, folks that were in the mining  
2 camps, farmers along the river, and one might not  
3 technically call them settlers, but the presence of the  
4 military in that area at that time would fall under that  
5 category. And then the last one would be the Indian  
6 reservation, the San Carlos Reservation that had been  
7 established by that time. Granted, it was their native  
8 homeland. The concentration of Native Americans at  
9 these military bases and on the reservation, again,  
10 although not technically a settler, they're population  
11 centers. Maybe that's a better way of phrasing it.

12 Q. And as I get it, what you're meaning to convey  
13 by this is nobody who lived up in that area ever  
14 bothered to nail a few boards together to make  
15 themselves a boat and go out on that river? Is that  
16 basically what you're telling the Commission?

17 A. No, I'm not telling the Commission that. I'm  
18 telling the Commission that the only evidence that we  
19 have of historic boating in the three segments that I  
20 looked at are summarized in a table in my report.

21 Q. Okay. And you're not pretending to say that  
22 this is proof that some guy living in a log cabin didn't  
23 nail a boat together and go fishing on the river?

24 A. No evidence as I've seen has been introduced  
25 in front of the Commission, either by your client or

1 anyone else, to suggest anything more than the accounts  
2 that I have.

3 Q. I understand that. And I think it's a  
4 simple --

5 A. Oh.

6 Q. -- yes or no deal. So you're telling the  
7 Commission that absent those four accounts, no one in  
8 the time frame that we're dealing with ever put a boat  
9 together and used those three segments of the river?

10 CHAIRMAN NOBLE: Mr. Helm, he's not telling  
11 the Commission that. Please move on.

12 MR. HELM: Sounds like it to me. I'm sorry, I  
13 disagree.

14 CHAIRMAN NOBLE: Please move on, Mr. Helm.

15 BY MR. HELM:

16 Q. In that, still in Paragraph 9 you talk about  
17 government assessments. Do you see that down there in  
18 the last sentence?

19 A. I do.

20 Q. What government assessments are you referring  
21 to?

22 A. Would you like me to turn to Section 5?

23 Q. If you want. I just simply want you to tell  
24 me what it is, you know.

25 A. Just getting a little tired, just trying to

1 refresh my memory here.

2 Q. Sure.

3 A. What I presented in the report are three  
4 independent government assessments.

5 Q. Can we just get the names of them? That's all  
6 I'm looking for.

7 A. Sure. In Paragraph 54 I present information  
8 related to a government, federal government survey by  
9 John Bartlett.

10 In 55 I present text from a memorial written  
11 from the Arizona territory to the Congress requesting  
12 funds related to improvements of navigable rivers  
13 currently at the time. I think it was 1865. And then  
14 my last government assessment is a listing of General  
15 Land Office maps that were prepared in my study area in  
16 the 1870s and '80s. And as I discussed this morning,  
17 among other things, those General Land Office maps  
18 considered whether or not in the surveyor's opinion that  
19 the stream was navigable or not.

20 Q. You've told us that for commercial streams and  
21 the Gila, that the depth must be at least three feet for  
22 commercial navigation, correct?

23 A. I believe I said that based on the boats that  
24 were customarily being used at that time that that is  
25 the depth of water that would have been conducive to

1 conducting commercial boat travel.

2 Q. Do you have an opinion on what the depth of  
3 water would need to be for recreational boat travel?

4 A. According to Mr. Fuller, recreational boat  
5 travel can be conducted, I got the impression,  
6 relatively easily -- unless I misunderstood him -- down  
7 to six inches, and I thought I heard both he and  
8 Mr. Farmer suggest that perhaps it could be -- rivers  
9 could be boated recreationally with as little as three  
10 inches.

11 I didn't spend much time, because I've been  
12 here, as we all have been. But I just did a little bit  
13 of research, at least, in the State of New Mexico where  
14 recreational boaters boat down the Rio Grande River, and  
15 I did find it interesting that they talk about once you  
16 get down to six or nine inches of water, it gets to be  
17 not a very pleasant trip for a recreational boater at  
18 those levels.

19 So it does make me question, well, maybe some  
20 people, maybe more experienced boaters can live with  
21 three inches of water or six inches of water, but I get  
22 the impression that even a recreational boater would  
23 prefer to have more water, even if they weren't trying  
24 to "have fun" or perhaps they wanted to do some  
25 whitewater where you would want more flow.

1 Q. Is that a long answer for the short answer; I  
2 didn't do any studies and I don't know what the depth  
3 for a recreational boat is?

4 A. I apologize if I was nonresponsive to your  
5 question.

6 Q. But I think my question was simply tell me  
7 what your opinion would be of the depth that would be  
8 required for recreational boating on those three  
9 segments.

10 A. The impression I got from the folks that  
11 actually suggest people can float various rivers that  
12 perhaps a foot of water would be a more enjoyable trip  
13 from a recreational perspective.

14 Q. That's your impression of somebody else's  
15 opinion. I'm asking you for what your opinion is. If  
16 you don't have one, it's fair just to say I don't have  
17 one.

18 A. Mr. Helm, I'm trying to say that my opinion  
19 based on those references that I looked at is that.

20 Q. Is the one, about one foot?

21 A. I would say one foot, yes, would not be an  
22 unreasonable depth for a recreational boater.

23 Q. In the Paragraph 16, you state that rapids can  
24 be an impediment to navigation. True?

25 A. Rapids can be an impediment to navigation,

1 that's correct.

2 Q. Based on the sight of them, I don't think  
3 there's probably anybody who would disagree with you on  
4 that point. Are there any rapids on the three sections  
5 that you examined?

6 A. There are some minor rapids, as I understand,  
7 in the Gila Box section.

8 Q. Okay. I have to admit while I've been on a  
9 lot of water in Arizona, most of it is lakewise or a  
10 very big river like the Colorado. Can you tell us where  
11 these rapids are in the Gila Box?

12 A. I remember viewing some YouTube videos where  
13 folks were going down the Gila Box and went through, as  
14 I recall, two or three rapids within the Gila Box. But  
15 where specifically they are in that 25-mile segment, I  
16 couldn't say.

17 Q. And I take it those were recreational boaters  
18 you were viewing?

19 A. That's correct.

20 Q. And is it also fair to say that there are no  
21 rapids that you're aware of located in the other two  
22 segments that you studied?

23 A. Segments A and C, no.

24 Q. You maintained that, if I understood your  
25 earlier testimony, that both the braided condition and

1 the meandering condition or single channel condition are  
2 natural to those segments?

3 A. That is my opinion, yes.

4 Q. All right. And my question is, in terms of  
5 historical time, do you know, did they split their share  
6 of the river 50/50? Was it 60/40 floods versus -- or  
7 braided versus straight channel?

8 A. The record that we have of whether it's  
9 braided or not begins with the expedition of Kearny or  
10 people's interpretation of Kearny's Expedition, which is  
11 1846, I believe, and then extends to the present.  
12 During that period, the floods that at least affected  
13 the area that I studied in the upper Segments 1, 2, and  
14 3 or Segments A, B, and C; the floods started, I  
15 believe, in 1905 and caused -- and then went through, I  
16 think 1914 or '15 -- caused substantial braiding which  
17 took several years for the river to recover. And  
18 perhaps the best way, Mr. Helm, for me to answer that  
19 question is to refer to a figure in my report which  
20 actually shows how the floodplain, the channel, I should  
21 say, of the active channel of the Gila River changed  
22 over that period of time. Would that help -- it sounds  
23 like you want me to say -- or not say, but you want me  
24 to answer how many years was it in one condition or the  
25 other?

1 Q. That's exactly what I'm looking for. And you  
2 can give it to me in a percentage, or you can give it to  
3 me as in a number of years. And I will trust somebody  
4 in the room that will do the division for me.

5 A. Sure. And to aid in my ability to answer that  
6 question, I'm going to refer to a figure that at least  
7 characteristic of the braiding, the change in the width  
8 of the active channel in the Safford or my Segment C.

9 Q. And that will be representative for the other  
10 two sections?

11 A. It would be representative in my opinion for  
12 Segment A, the Duncan reach. But my opinion has been, I  
13 think I talked to you about it this morning, was that I  
14 don't have any evidence to indicate that the Gila Box  
15 reach was necessarily ever braided.

16 Q. Okay. So we can set that aside when we have  
17 discussion about braiding. It's just to the other two  
18 segments that we're going to be talking about, right?

19 A. That's right.

20 CHAIRMAN NOBLE: Okay. Mr. Helm, do you have  
21 more than about ten more minutes?

22 MR. HELM: I'm scared to tell you.

23 CHAIRMAN NOBLE: I know. You should be.

24 MR. HELM: And understand, I've moved through  
25 several documents here.

1 CHAIRMAN NOBLE: You're doing really well.  
2 We're proud of you.

3 MR. HELM: Without being able to go through  
4 and X it out, because I get off on tangents that  
5 sometimes I find I've written questions down that I'm  
6 later -- I've covered 10 of 99 pages.

7 CHAIRMAN NOBLE: Ten of 99?

8 MR. HELM: Yes.

9 CHAIRMAN NOBLE: You're not likely to cover  
10 all 99 today.

11 MR. HELM: Even if I X out a bunch -- and I  
12 have already -- I don't think we're going to make it.

13 CHAIRMAN NOBLE: No, you're not going to get  
14 to cover them ever, period. Okay? So you better make  
15 up your mind what you want to cover because we've got  
16 how many more people that want to ask questions today?  
17 Joe?

18 MR. SPARKS: I'll pass.

19 CHAIRMAN NOBLE: You're going to pass?

20 Well, then, we're going to take a break right  
21 now, and we might stay till 5:30; but 5:30 comes, this  
22 witness is done.

23 MR. HELM: I pays my nickel and I takes my  
24 chances.

25 CHAIRMAN NOBLE: Let's take ten minutes.

1 (Recessed from 4:17 p.m. to 4:33 p.m.)

2 BY MR. HELM:

3 Q. I hate to do this to you, but maybe it will be  
4 easier than it was when I asked it of Mr. Gookin.

5 A. Okay.

6 Q. You've already identified a number of areas  
7 where you disagree with Mr. Fuller's testimony,  
8 correct?

9 A. (Nods head.)

10 Q. Have you got any that you haven't mentioned  
11 yet? And if you do, would you please mention them so we  
12 know all of those items that you disagree with  
13 Mr. Fuller's testimony in?

14 A. Okay. And I will do this as rapidly as I can.  
15 To answer your question, when I went through his  
16 original PowerPoint, I identified some slides that I had  
17 questions about or concerns. And so to answer his  
18 question in the most efficient manner, I will quickly  
19 page through those, if everyone agrees that's useful,  
20 and I'll try to as quickly as possible identify what  
21 those concerns are.

22 Q. Let her rip.

23 A. Slide 16, Mr. Fuller makes the statement, the  
24 real question, is the flowing part of the river deep and  
25 wide enough to float a boat -- or to float boats. I

1 believe that just simply floating a boat is not  
2 sufficient to meet the Daniel Ball Test.

3 Slide 21, he indicates that shallow flow would  
4 be an impediment to -- or to be an obstruction to a  
5 canoe if it was only 0.5 feet. Again, I feel that from  
6 a navigability perspective that wouldn't be sufficient  
7 depth of water.

8 I'm doing this for completeness. I'm not -- I  
9 don't want to be here any longer than anybody else.

10 Q. Let her rip. Don't pause.

11 A. Slide 29, he comes to a series of conclusions  
12 regarding the Gila River. Was navigable in its ordinary  
13 and natural condition, I disagree with. Has a history  
14 of navigation, I disagree with. Is still used for  
15 navigation, I disagree with. Is susceptible to  
16 navigation, I disagree with. Was more susceptible to  
17 navigation before it was dam-diverted and altered.  
18 Although I still agree it's not navigable, if those  
19 diversions weren't there, there would be more water in  
20 the river.

21 Slide 73, he indicates bull boats were used in  
22 Segments 2 and 3. I don't believe there's any evidence  
23 of that.

24 Without going through each one, I disagree  
25 with slide 76 where he lists the various reasons why,

1 quote, didn't the trappers and explorers boat the Gila  
2 River. As I think I've said both this morning and this  
3 afternoon, I disagree with him. I'm trying to be  
4 complete, Mr. Helm, so you don't say --

5 Q. Just keep ripping. Go ahead. Stay on task.

6 A. Slide 78 is how to interpret early river  
7 descriptions. I don't agree with his interpretation of  
8 early river descriptions.

9 This is to, I think, the benefit not only of  
10 you or the Commission, but his photograph of the Gila  
11 River -- no, this is near Kelvin, so strike that.

12 Slide 100 is related to James O. Pattie. I  
13 disagree with his including eight dugout canoes  
14 comfortably descending the Gila River when I believe  
15 that was the Colorado River.

16 Also disagree with his bullet that canoed from  
17 Safford to Yuma several times. I don't believe there's  
18 any evidence of that.

19 Slide 110, I disagree with his statement  
20 regarding what Stanley Sykes did.

21 Slide 145, he goes through, summarizes the  
22 results from my analysis of stream flow conditions. Not  
23 only as my counsel indicated, there's some errors in his  
24 transfer of numbers from my table to his, but also he  
25 omitted any "less thans," which I discussed at length

1 this morning.

2 Slide 152, as related to Cimarron Adventures,  
3 he indicates that for 17 years, although recently  
4 stopped commercial navigation. I testified this morning  
5 that I disagree with that.

6 There's a series of slides where Mr. Fuller at  
7 least says respect to my three segments compared flow  
8 data to how much water a boat would need to float. By  
9 inference, since I think it's not just the amount of  
10 water to float a boat, but whether or not you could have  
11 a, whether that flow allowed you to have a highway for  
12 commerce; I disagree with him there. That applies to  
13 several slides related to his -- that compared flow data  
14 to boating requirements.

15 CHAIRMAN NOBLE: Mr. Burtell, could you  
16 identify some of those slides for the record?

17 THE WITNESS: Yeah, I probably should.

18 BY MR. HELM:

19 Q. Those are the ones with the green covers on  
20 that you're looking at there?

21 A. But I can very quickly --

22 Q. Okay.

23 A. Slides 155, slides 158.

24 MR. HOOD: Are those the old pagination,  
25 Mr. Burtell?

1 THE WITNESS: And that's a huge point. I  
2 printed this out when we got this ten days before or so,  
3 and when we walked in here, there's new slides. All of  
4 these --

5 MR. HELM: They're green.

6 CHAIRMAN NOBLE: It's the original submission?

7 THE WITNESS: This is with reference to the  
8 original submission.

9 MR. HELM: Okay.

10 THE WITNESS: The numbers are off a bit.

11 MR. HELM: That's fine.

12 CHAIRMAN NOBLE: Which is in evidence.

13 BY MR. HELM:

14 Q. We can muddle through. Keep going.

15 A. Slide 162 is the last of the three slides  
16 related to those comparisons. Even though I'm not here  
17 to testify related to the other segments, I would have  
18 the same concerns related to Segments 4, 5, 6, 7, and 8.

19 And 4, for example, is on Page 165.

20 I disagree on slide 191 as to how he  
21 interprets the Colorado River and whether or not the  
22 navigability of the Colorado River has a bearing or  
23 influence on how we look at other rivers in the state.

24 And in light of all that, in the last slide  
25 for his first PowerPoint, I would therefore also

1 disagree with his conclusion slide, which is 194,  
2 indicating that in his opinion it was a navigable  
3 watercourse. And I understand he focused on all eight  
4 segments. I focused on his first three.

5 Getting into his second presentation, the  
6 boating presentation.

7 On slide number 6 of his boating presentation,  
8 I don't agree with all of the uses that he cites that he  
9 would consider trade and travel as being considered by  
10 Daniel Ball for a commerce definition.

11 I disagree with his slide 19. Certainly  
12 portions of it related to his description of steamboats  
13 used on navigable Colorado. He indicates it's only  
14 navigable in high stage. I disagree with that.

15 He says navigation is difficult and dangerous,  
16 although even with those difficulties and danger, it  
17 became a very robust business.

18 I disagree with the premise on slide 47. I  
19 think I've mentioned before he makes the statement when  
20 the rivers had the water, Arizona didn't have the  
21 population. It's my contention, at least in the upper  
22 Gila, that there were population centers that were of  
23 sufficient size that could certainly have benefited from  
24 commercial navigation.

25 So slides 47, 48, 49, 50, and 51 are all

1 related to why weren't there more boating accounts in  
2 Arizona streams, and I generally disagree with the  
3 premise of most, if not all, of those slides.

4 Slide 53, in particular, some segments of  
5 Arizona rivers not conducive to carrying major tonnage,  
6 not easy to travel upstream. I think one needs to look  
7 at those factors, among others, about whether or not you  
8 deem something navigable or not.

9 I disagree with his faulty logic statement on  
10 54, if the river was navigable, people would have  
11 regularly boated it. He's saying that that statement is  
12 a faulty logic. I believe pretty strongly, based on my  
13 study of Arizona and its rivers, that if the river was  
14 navigable, indeed, people would have regularly boated  
15 it.

16 Slide 62 on boating, I would certainly take  
17 issue with the relevancy of federal minimum standards  
18 for recreational boating necessarily being relevant to  
19 this proceeding.

20 And last, but not least, on slide 93, he  
21 indicates required depths to float these various boats,  
22 historic and modern. And I believe that, again, it's  
23 not just the ability to float a boat, but it's the  
24 ability to use that boat as a highway of commerce, and  
25 those are different things as I believe I've testified

1 to. And that's it.

2 BY MR. HELM:

3 Q. Thank you. In your testimony here today, you  
4 refer quite a bit to the desires and the wants of the  
5 citizens of Arizona vis-à-vis the miners wanted to get  
6 their stuff to market and they needed supplies, and they  
7 wanted to have boats bring supplies up the river to  
8 them, and the Army needed supplies, and they wanted them  
9 to bring it up the river to them. And you gave a number  
10 of examples, and they all seem to me to involve upstream  
11 delivery of goods and services. Fair?

12 A. I would disagree with that.

13 Q. Okay. Is use of the river in an upstream  
14 fashion a requirement for a navigability finding?

15 A. It is a factor that in my opinion one should  
16 look at. It is not the only factor.

17 Q. Just downstream transportation alone is not  
18 sufficient to make a navigability determination?

19 A. I did not say that.

20 Q. I understand. That's a question.

21 A. Could you state the question again, please?

22 Q. Sure. Is downstream travel by and of itself  
23 sufficient to make a navigability determination?

24 A. By itself, it is certainly a factor that could  
25 be considered; but it is not the only factor that should

1 be looked at.

2 Q. And you would say it's not sufficient then?

3 A. Yes.

4 Q. On cross-examination earlier, you were talking  
5 about floods, and you said, I think -- I just want to  
6 make sure I understand it. The ten to fifty-year event  
7 would constitute what you mean when you're talking about  
8 floods in your report, and I'm assuming that that's a  
9 recurrence standard?

10 A. Yes.

11 Q. Okay. And the nine to zero is no flood, just  
12 high water?

13 A. As I think I indicated with Joy this afternoon  
14 is that floods occur in any given year, but I think I  
15 was being asked the question how I was referring to  
16 floods in my report as it has to do with Winkleman  
17 distinguishing natural conditions. So when I was  
18 referring to a flood, I was indicating, yes, a larger  
19 flow event. But I would also point out that, and maybe  
20 in addition to what I said to Joy, that if you have a  
21 high monsoonal flood event, that that in itself -- it  
22 might occur only over a day or a half a day, that that  
23 in itself would probably also not be considered -- or  
24 should be looked at as something to evaluate as natural  
25 and ordinary because it won't be around for very long.

1 It will just be there, and then it will go.

2 Q. You had a section in your report where you  
3 discussed surveys --

4 A. Yes.

5 Q. -- and their consequences, and you mentioned  
6 Dr. Littlefield and his work.

7 A. Yes.

8 Q. And the surveys that you listed all appeared  
9 to be in Duncan Valley or the Safford area, correct?

10 A. Correct.

11 Q. Did you do the actual research on those  
12 surveys, or did you rely on Dr. Littlefield for that  
13 information?

14 A. As I believe I testified this morning or this  
15 afternoon -- I can't remember now; everything is  
16 blurring together. Dr. Littlefield's first report and  
17 his second report, as I understand, did not specifically  
18 look at those maps in my study area. So I did not rely  
19 on his analysis of those maps. It was my own.

20 Q. So these conclusions in this report are your  
21 conclusions based on your research in the Duncan Valley  
22 and the Safford Valley surveys, not Dr. Littlefield's?

23 A. Yes.

24 Q. You talk about an accounting approach when you  
25 were doing your stream reconstruction. And I got the

1 impression -- I just want to make sure I'm right -- that  
2 it was one and one equal two. You just simply went  
3 along and added the flow back in from wherever you found  
4 records of what the diversion was?

5 A. At each one of the gage sites I evaluated, I  
6 attempted to add to that gage site all of the diversions  
7 that I identified upstream of it. So it might be more  
8 than one plus one. It might be several different  
9 diversions.

10 Q. Sure. I understand.

11 A. Okay.

12 Q. I just want to make sure you weren't laying  
13 some fancy engineering calculation on me that I never  
14 heard of in doing this, and this is as simple as you  
15 said it was.

16 A. It was a lot of effort, but in terms of the  
17 mathematics of it, it was a lot of addition.

18 Q. Regarding braided rivers, did I understand you  
19 right, what you're telling us is that you can't use them  
20 for navigation because there's not enough water in any  
21 one braid?

22 A. I think I answered this question from you --

23 Q. You could have, and I apologize if I'm  
24 repeating it.

25 A. Yeah, I indicated based on the braiding of the

1 Gila River in Arizona, I would not believe that that  
2 would be conducive to navigation.

3 Q. And the general concept of that is just a  
4 function of how much water there is in the braid, right?  
5 Or in the braid and in the channel flows within the  
6 braid?

7 A. As I indicated in my flow reconstructions, I  
8 concluded that there wasn't sufficient depths of water  
9 when the channel was not braided to be amenable to  
10 commercial boat travel. By inference then, when the  
11 channel, if it were to be braided and split into  
12 multiple channels, those depths would be somewhat less  
13 than that. So then by inference, a braided channel,  
14 there would be even less water than I have tried to  
15 reconstruct.

16 Q. If we have two braids with 10 CFS in it and  
17 they split the water, there's 5 CFS in each braid is  
18 basically what you're saying?

19 A. It's not always as simple as that.

20 Q. That's the theory though?

21 A. The proportions might not be 50/50.

22 Q. Because one channel is deeper than the other?

23 A. Not always, but sometimes that could explain  
24 it, but not always.

25 Q. What would the "not always" be?

1 A. There are some times when you just have two  
2 channels of similar depths that might be carrying -- one  
3 might be simply larger than the other. You might have  
4 one carrying, I don't know, 10 CFS and the other  
5 carrying 2 CFS. So there can be differences.

6 Q. In your report you talk about 1.5 feet per  
7 second velocity?

8 A. Can you --

9 Q. Sure. It's paragraph 90-91.

10 A. Paragraph -- excuse me?

11 Q. 90-91. I forget where it is in the -- I have  
12 a simple question for you. Is it your opinion that that  
13 velocity would prohibit boat travel?

14 A. I believe that those velocities when, in light  
15 of the depths that are associated with those velocities  
16 would, for practical purposes, inhibit upstream  
17 commercial boat travel.

18 Q. So I couldn't go upstream, but I could go  
19 downstream?

20 A. Yes.

21 Q. You have referenced the Utah case and the  
22 Special Master and their findings of needing three feet.  
23 Is that basically your premise for the determination  
24 that you've got to have at least three feet for  
25 commercial navigation?

1 A. I believe, as I've testified, that that case  
2 in combination with the Washington criteria, and  
3 probably as importantly, the actual depths that were  
4 observed in the Colorado River where commercial  
5 navigation was being conducted, that three feet is a,  
6 certainly a reasonable cutoff as was found in Utah and  
7 the State of Washington as well as a practical cutoff if  
8 one was only looking at minimal depth as a factor.

9 Q. Wasn't Washington less than three feet?

10 A. The standard was between 2 and 3.5 may be  
11 navigable under certain conditions.

12 Q. And what sections of the Colorado River are  
13 you referring to that led you to the three foot?

14 A. Certainly the section from Fort Yuma up to  
15 Fort Mohave.

16 Q. Okay. Do you have somewhere in your report  
17 the depth indicated in that stretch?

18 A. Yes. I discussed that at length this morning.  
19 You might recall when I was joking about what was in the  
20 footnote, no one reads footnotes. As I mentioned this  
21 morning that --

22 Q. Is that the five and a half feet, four and a  
23 half, whatever footnote that you're talking about?

24 A. That's correct.

25 Q. Got it.

1 Did you place any reliance on any one of those  
2 three items that was greater than any of the other three  
3 or the other two? More weight on the Utah decision than  
4 on the depth of the flow at Yuma City?

5 A. I think the Utah decision was particularly  
6 relevant in my mind in light of the date that that  
7 issue -- or that decision was issued, and the associated  
8 survey that was done by the federal government that the  
9 Special Master looked at.

10 Q. Did you do any factual study to determine the  
11 similarities of the three rivers that are covered in the  
12 Utah case with the Gila River in your particular three  
13 segments?

14 A. I did. And to answer that, with respect to  
15 the type of factors that the Special Master considered  
16 in the Utah case for the Grand, the Green, and the San  
17 Juan River, among other things, he listed the number of  
18 days in a year when the flow would be greater than or  
19 less than certain depths for those rivers. So I looked  
20 at that.

21 Q. Well, I know you looked at it, but did you  
22 prepare a study where you set out the facts that you  
23 found that were the same on the Gila River as the three  
24 rivers covered in the Utah case?

25 A. I guess I don't know exactly what you mean by

1 study. But what I did is used the Special Master's  
2 conclusions and data and compared it to my flow  
3 reconstructions that are, I think, described in some  
4 detail in my declaration. So to the degree that that  
5 was part of my study, I didn't do a separate study above  
6 and beyond that.

7 Q. So if I understand what you're telling me is  
8 you didn't, for example, take the length of the river,  
9 of the Green and compare the channels in terms of shape  
10 on the Green through its length to the Gila?

11 A. Again, Mr. Helm, among the other things I  
12 looked at was the quote that I read this morning that  
13 was in the Special Master's report where the so-called  
14 Leeds survey did exactly what you're asking me if I did.  
15 So I did not do a detailed stretch by stretch depth  
16 analysis. But the Leeds survey did just that, and the  
17 Special Master summarized the findings of that survey in  
18 his report of which I then reviewed and compared to my  
19 flow reconstructions.

20 Q. I just want to get it as certain as I can that  
21 you didn't conduct a factual investigation, and what I  
22 mean by that, go out in the field, measure the widths of  
23 the Green River and come down and compare it to the  
24 widths of the Gila? You didn't do a geological analysis  
25 of the Green as compared to the Gila?

1 A. I did not --

2 Q. Those kinds of things. I mean, I can keep  
3 running on. We can talk about hydrology, yadda yadda  
4 yadda. But my point is, you didn't do that kind of  
5 technical study for the Gila that the Special Master in  
6 the Utah case had done for him?

7 A. I did not do an independent assessment of the  
8 Green and the Grand Rivers, that is correct, or the San  
9 Juan.

10 Q. Thank you.

11 Did you do any study to determine the  
12 difference between -- and I may have asked this. I  
13 apologize, but I'm getting kind of down to the end of  
14 these things -- the drafts that modern canoes, modern  
15 flatboats have and compare them to the drafts of the  
16 boats that were in use around statehood to determine  
17 what the differences were? Simple yes or no.

18 A. The analysis that I did was to study the  
19 depths of those boats as was presented in the Special  
20 Master's report for Utah.

21 Q. You didn't do anything yourself?

22 A. No.

23 Q. In Paragraph 108, the way I read it, you are  
24 acknowledging that currently the upper Gila can be  
25 boated by small craft, but it is not a commercially

1 viable form of boating.

2 A. I would agree with that statement.

3 Q. May be the last question. Don't get your  
4 hopes up, though.

5 A. Can I just say yes or no?

6 Q. Oh, yes, if you will just put a yes or no on  
7 the record and let me construct the question, we can  
8 wind this case up real quick.

9 MR. KATZ: Just say maybe.

10 MR. HELM: Oh, boy, I lost the question.

11 BY MR. HELM:

12 Q. You state that in order for a river to be  
13 navigable in Paragraph 111, that there is a requirement  
14 for commercial activity that must be of a sustained  
15 nature. Define for me what you mean by the word  
16 "sustained." How long?

17 A. I think it's difficult to put a precise time  
18 period on what that would be. I think one would have to  
19 look at, again, multiple lines of evidence and based on  
20 that lines of evidence -- maybe another way of saying  
21 sustained would be regular, and then you're going to ask  
22 me well, "What's regular?"

23 Q. You're absolutely right.

24 CHAIRMAN NOBLE: Rich, go ahead and say what  
25 "sustained" is. Don't worry what he's going to ask you.

1 Let's not be going where that is.

2 THE WITNESS: And I don't mean to be flip in  
3 answering your question, but certainly more than three  
4 or four historic accounts of boating over the, you know,  
5 several decades. I would think that the type of  
6 enterprise that has developed on the Colorado River  
7 would be some indication of a sustained commercial  
8 enterprise, a sustainable commercial enterprise.

9 BY MR. HELM:

10 Q. And that discussion about sustained and the  
11 actual boating discussions are in reference to the  
12 actual use of the Gila River, correct?

13 A. It would also apply to the susceptible.

14 Q. Okay. I'm game. How do you have susceptible,  
15 sustained use if it isn't being used?

16 A. Well, going again back to the Utah case, as I  
17 understand it, where the Special Master indicated that  
18 if you are in an area which is undeveloped, and the only  
19 reason why there wasn't, my words, a sustained or  
20 regular, practical, useful application of the river as a  
21 highway of commerce is because there wasn't anybody  
22 there; then that's a way that you can have a watercourse  
23 that is susceptible to navigation without there actually  
24 being navigation.

25 Q. But there's no sustained requirement in the

1 susceptibility test, is there?

2 A. Oh, I would disagree. You would need  
3 conditions such that even if there wasn't navigation in  
4 a -- in a case where the river is there but the people  
5 aren't there, there still has to be characteristics of  
6 the river that had there been people there, then it  
7 would have been done in a sustainable way.

8 Q. And would it be your contention that the  
9 susceptible test should apply at the date of statehood?

10 A. Yes.

11 Q. So we're talking about the kind of commerce  
12 that would be sustained at statehood?

13 A. My understanding of Daniel Ball, not being a  
14 lawyer, but we are to look at at or before statehood.

15 Q. Okay. I'm surprised. It was more than one,  
16 but I'm done.

17 CHAIRMAN NOBLE: That was a great last  
18 question. I liked it.

19 Okay. Is there anyone else who wants to  
20 examine Mr. Burtell at this moment?

21 MR. HOOD: I have a few redirect, but it's  
22 5:00. I'm more than happy to do it by written  
23 affidavit, as you suggested, and I'll stipulate it will  
24 be less than a page.

25 CHAIRMAN NOBLE: Well, then, let's have you do

1 it right now.

2 MR. HOOD: Let's do it.

3 CHAIRMAN NOBLE: Because Mr. Katz looks  
4 thoroughly bored.

5 MR. KATZ: Just sleepy.

6 CHAIRMAN NOBLE: Why don't you just stand and  
7 face him while John is cleaning up.

8 MR. HELM: I've got to clean up my mess.

9 MR. HOOD: Do you mind if I go to the table  
10 beside him?

11 CHAIRMAN NOBLE: Sitting together?

12 MR. HOOD: I don't know if I'm going to sit  
13 next to Mr. Helm, but --

14 CHAIRMAN NOBLE: Will the record reflect  
15 they're sitting next to each other.

16 MR. HELM: I'm standing up. I'm getting out  
17 of here as fast as I can get. I can wait to clean up  
18 later.

19

20

REDIRECT EXAMINATION

21 BY MR. HOOD:

22 Q. Mr. Burtell, I'm going to be very brief.

23 There was a couple of series of questions that you dealt  
24 with on cross-examination about various kinds of  
25 commercial activities, including fur trapping and mail,

1 and are these commercial activities, et cetera.

2 If you have an instance of one of these kinds  
3 of activities going on, boating on the river for fur  
4 trapping or mail, is that in and of itself enough to  
5 qualify as a highway of commerce under your  
6 understanding?

7 A. No. And again, if I haven't made the point, I  
8 would like to again make it, that there needs to be, in  
9 my opinion, at least, multiple lines of evidence of such  
10 activities to ultimately deem a river course navigable.

11 Q. And there was discussion about floods versus  
12 monsoons versus droughts. Do you remember those general  
13 discussions?

14 A. I do.

15 Q. Okay. And you defined what you felt to be  
16 floods that would not be in the ordinary condition.  
17 What is your opinion with respect to -- and I'll do a  
18 hypothetical for you. You've got a stream that is  
19 generally not navigable under your test, but perhaps  
20 under this hypothetical it could be used as a highway  
21 for commerce during either the high runoff during a  
22 particular part of spring, so let's just say a couple  
23 weeks during spring, or just a couple weeks during the  
24 high monsoonal season. Has any of your testimony today  
25 been meant to indicate that that would be a navigable

1 stream?

2 A. No.

3 Q. Can you explain?

4 A. Well, again, when you have -- and the upper  
5 Gila is a fine example. When you have the spring melt  
6 runoff in March, in April, and then the summer monsoons,  
7 those flows are going to get elevated, and I agree to  
8 that.

9 But my flow reconstructions would indicate  
10 that even under those elevated flows during those  
11 periods of time, you still wouldn't have sufficient  
12 depths that in my opinion would be conducive to  
13 commercial boat travel.

14 Q. There were some questions -- I think this  
15 might have been Ms. Hernbrode. Sorry, Joy, she's not  
16 here anymore.

17 She may have asked you a question about  
18 recreation on the San Juan, and I think she thought  
19 maybe some of your boating was done there, and that was  
20 based on some things you said earlier this morning.

21 Can you describe what it is that you looked at  
22 with respect to the San Juan and recreational boating?  
23 Not yourself in a boat. I think that's where the  
24 confusion was.

25 A. Yeah, I think what I -- the point I was trying

1 to make, and I probably did a poor job of it, was the  
2 San Juan River has been deemed by the Supreme Court as a  
3 nonnavigable river. And yet, there are commercial  
4 outfitters that use that river right now for  
5 recreational boating, using rubber rafts. Those rafts  
6 weren't available at the time of our statehood. I  
7 understand that rubber was available. But for practical  
8 purposes, they weren't available in 1912 in any regular  
9 basis. And even the concept of recreational boating, if  
10 you will, down the San Juan or through the Grand Canyon,  
11 is something that even though some people did it, from a  
12 large scale recreational perspective, as I think we've  
13 talked about, that's something that evolved more in the  
14 '50s, '60s, '70s.

15 And so the presence of commercial boating in  
16 the San Juan is a case where I think the Commission  
17 needs to be mindful of not just saying, hey, if it's  
18 commercial boating, i.e., that means navigable river.

19 Q. That doesn't necessarily mean a highway for  
20 commerce.

21 A. Exactly. And as much as maybe the proponents  
22 of navigability would want to -- I don't want to say  
23 forget, but not highlight it, to me that's the  
24 foundation of Daniel Ball, highway of commerce.

25 Q. If you turn quickly to Page 19 of your

1 declaration, Paragraphs 90 and 91 that were, fairly  
2 recently Mr. Helm had a couple questions about your  
3 evaluations of the velocity and how that would impact  
4 upstream travel. Do you remember those questions and  
5 answers?

6 A. I do.

7 Q. Okay. And he ended that line of discussion  
8 with a question along the lines of you could go  
9 downstream but you couldn't go upstream. Do you  
10 remember that?

11 A. And I was thinking when he said downstream,  
12 you could float downstream, not necessarily commercially  
13 go downstream, but --

14 Q. Okay. That was the clarification I was  
15 looking for.

16 A. Okay.

17 MR. HOOD: That's all I have, Mr. Chairman.

18 CHAIRMAN NOBLE: Thank you. Anyone else?

19 We're getting back together --

20 MR. HELM: I can start over if you want me to.  
21 I've got a few more.

22 CHAIRMAN NOBLE: Thank you, Mr. Helm, for  
23 offering not to.

24 We're going to get together again on the 18th  
25 of August. We do believe we'll be back here. Is that

1 correct, George?

2 MR. MEHNERT: Same room.

3 CHAIRMAN NOBLE: Okay. We'll start at 9:00  
4 a.m., and the purpose will be to spend two days  
5 concluding the evidence on the Gila River, primarily  
6 through the direct examination of two witnesses from  
7 Mr. McGinnis. Then we will go into the hearing on the  
8 upper Salt, which we would like to get done by that  
9 Friday.

10 The following Friday, which will be the 29th  
11 of August, we intend to meet in Florence for a late  
12 brunch, and then we'll see if anybody shows up to talk  
13 to us. Okay?

14 MR. MEHNERT: At 11:00.

15 CHAIRMAN NOBLE: We'll do that at 11:00, yes.  
16 Joy requested 11:00. We'll do it at 11:00.

17 Any other questions, comments?

18 Yes, Mr. Katz.

19 MR. KATZ: Just wondering, even though I don't  
20 think we will be long -- I don't know about cross -- I  
21 don't know whether we'll have any opportunity for  
22 rebuttal; and it doesn't matter to me whether that would  
23 follow or precede the hearing on the upper Salt. But I  
24 just was a little bit concerned about having at least a  
25 brief opportunity to do that.

1 CHAIRMAN NOBLE: In the late afternoon of  
2 Monday, the 18th, we'll make a decision on when we're  
3 going to do rebuttal.

4 MR. KATZ: That's fine. Thank you, kindly.

5 CHAIRMAN NOBLE: Other questions, comments?

6 We have appreciated your patience, your  
7 diligence, your good work. Glad we were here.

8 Mr. Hennes was glad he was here.

9 MS. HACHTEL: He's more glad he left.

10 COMMISSIONER HORTON: Cynicism is not nice.

11 CHAIRMAN NOBLE: The record is off.

12 (The proceeding recessed at 5:15 p.m.)

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I, GARY W. HILL, Certified Reporter No. 50812  
 for the State of Arizona, do hereby certify that the  
 foregoing printed pages constitute a full, true and  
 accurate transcript of the proceedings had in the  
 foregoing matter, all done to the best of my skill and  
 ability.

WITNESS my hand this 7th day of July, 2014.




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GARY W. HILL, RPR  
 Certified Reporter  
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