

6-4-1981

## Trial Transcript, Vol. 76, Afternoon Session

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File 183  
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Case # 4993

File # 183

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IN THE DISTRICT COURT FOR THE FIFTH JUDICIAL DISTRICT

WASHAKIE COUNTY, STATE OF WYOMING

IN RE: )  
)  
THE GENERAL ADJUDICATION OF )  
ALL RIGHTS TO USE WATER IN )  
THE BIG HORN RIVER SYSTEM )  
AND ALL OTHER SOURCES, STATE )  
OF WYOMING. )

Civil No. 4993

FILED \_\_\_\_\_

6/23

1981

Margaret V. Hampton CLERK  
DEPUTY

VOLUME 76

Afternoon Session

Thursday, June 4, 1981

**ORIGINAL**



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THE SPECIAL MASTER: Okay, we are in session. You may examine, Mr. White.

MR. WHITE: Thank you, Your Honor.

Q (By Mr. White) Mr. Vogel, I direct your attention to what has been admitted as U. S. Exhibit C-284. As I recall your testimony earlier, this is a graph which you cut off at the righthand side, but actually you had originally run farther to the right, is that correct?

A. Yeah, that's correct.

Q And you said that it continued on in the downward direction, or decreasing direction to the right?

A. I believe that was the case.

Q Was it essentially a linear reduction, in other words, it just kept going in the same general straight line?

A. I can't recall. Quite frankly, I can't remember if it was a straight line or if it had a slight curve to it. I can't recall right offhand.

Q I direct your attention to what has been marked for identification as Plaintiff's Exhibit FISH-284 --

THE SPECIAL MASTER: FISH what?

MR. WHITE: 284.

THE SPECIAL MASTER: Thank you.

Q (By Mr. White) And ask you whether or not that is a copy, at least the lefthand side portion of that, of vogel-cross-white



1 U. S. Exhibit C-284, with the graph portion of it  
2 extended to the right?

3 A. Yes, I believe that's correct.

4 MR. WHITE: I apologize to the Court for the  
5 quality of the image, but it is the best we could  
6 do off of a solid rather than an acetate original.

7 Q (By Mr. White) Do you have the data with you from  
8 which you could reconstruct the curve that extends  
9 to the right?

10 A. Yes.

11 Q Would you get it out, please?

12 MR. SACHSE: Your Honor, we object to this unless  
13 there is some showing of a very direct relevance. We've  
14 had, as I see, almost a full day of cross-examination of  
15 this witness, and there has to be some measure of trying  
16 to get to the end of it, and the witness has testified  
17 as to the graph curves that he has made, and if the State's  
18 interested in presenting graphs to go further, they can  
19 do so through their own witnesses.

20 THE SPECIAL MASTER: Well, I am inclined to want  
21 to sustain the objection, but I'm going to -- I'm going  
22 to overrule it for the time being.

23 MR. WHITE: Thank you, Your Honor.

24 THE SPECIAL MASTER: And see how far we get on

25 vogel-cross-white



1 this, on what relevance the statistical -- after the  
2 last flow figure on each of these charts and, if you  
3 show that then, the questions would be appropriate,  
4 and if not, then they should be overruled.

5 MR. WHITE: Thank you. If, after I go through  
6 one, you will see.

7 THE SPECIAL MASTER: All right.

8 What page in your report is that one you're  
9 working on, Mr. White?

10 MR. MEMBRINO: I believe that's ..32, Your Honor.

11 THE SPECIAL MASTER: Thank you.

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1 THE WITNESS: Okay, this is the data.

2 Q (By Mr. White) After reviewing that data, are you able  
3 to approximate what that curve looked like when you  
4 originally ran it?

5 A No, I just simply said I have the data from which I can  
6 reconstruct the curve.

7 THE SPECIAL MASTER: Can you show us with a line,  
8 if Mr. White would permit it?

9 MR. WHITE: That would be fine, Your Honor.

10 THE SPECIAL MASTER: How long the data would show it  
11 would take.

12 THE WITNESS: Your Honor, I can briefly --

13 THE SPECIAL MASTER: You did it on direct, you made  
14 an observation that it would come downward on direct.

15 THE WITNESS: See, basically what happened when I  
16 ran it out to a higher flow, it went down on a downward  
17 direction. There was no portion of the adult life history  
18 stage that was higher than what this portion of the graph  
19 was, so it didn't make much sense to run it out to such  
20 a wide range of flow. I just restricted to this portion  
21 of the graph. I had to run it through the computer again  
22 to get a new graph to print it all the way out to here.

23 Q (By Mr. White) So you're unable to indicate what the line  
24 looked like in general?

25 vogel-cross-white



1 A Like I said before, I am confident there was no point on  
2 the adult curve that was higher than this point here, the  
3 best I can remember (indicating). But as far as, you know,  
4 what kind of slope it was here and there, I can't  
5 remember.

6 THE SPECIAL MASTER: Are you confident there was  
7 no point that would be lower than 200 feet?

8 THE WITNESS: Pardon?

9 THE SPECIAL MASTER: Are you confident there was no  
10 point that would be lower than the point of origin?

11 THE WITNESS: No, sir. This is the statistical limit  
12 I could extrapolate below my calibration flow. This is  
13 as far as the model permitted me to estimate.

14 THE SPECIAL MASTER: But on the other side, would  
15 it fall back again to as low as the beginning?

16 THE WITNESS: As low, at this point?

17 THE SPECIAL MASTER: Yes.

18 THE WITNESS: Yes. I can't remember if it reached  
19 that point on past it. It's quite possible it could have.

20 THE SPECIAL MASTER: Well, that answers your question,  
21 Mr. White.

22 Q (By Mr. White) Mr. Vogel, as I recall, you selected a  
23 flow recommendation of 500 c.f.s. during May. That was  
24 your optimum flow for this particular reach?

25 vogel-cross-white





- 1 A Yes, that's correct.
- 2 Q So that would have been about here on your curve? (Indicating.)
- 3 (Indicating.)
- 4 A Yes.
- 5 Q And that would have meant that you had a habitat area of
- 6 about 64,000 square feet; is that correct?
- 7 A For adult rainbow trout.
- 8 Q Yeah. Turning to Page 30 of your report, isn't it true
- 9 that the one in ten-year flow, against which you worked,
- 10 the natural flow, is that what that's called, the
- 11 recurrence interval low flows which you got from Mr. Keene,
- 12 was 1,131 c.f.s.?
- 13 A That's correct.
- 14 Q So on Exhibit FISH-284, that would mean that your adult
- 15 line would be intersected where I am drawing a red circle
- 16 or where I have my pointer?
- 17 THE SPECIAL MASTER: Why don't you make it an X.
- 18 MR. WHITE: Okay, I will, Your Honor.
- 19 THE WITNESS: Yes, that's about right.
- 20 Q (By Mr. White) Put a red X there. Isn't it true that
- 21 at that flow the habitat would be about 5.1 or roughly
- 22 51,000 square feet?
- 23 A Yes. For adult rainbow trout.
- 24 Q And if it's your one in five-year flow, if this curve
- 25 vogel-cross-white



1 continued on in the same general direction or same  
2 general slope for roughly an inch or so, the one in five-  
3 year flow was 1,393 c.f.s.?

4 A Right.

5 Q And where I have my red marker pointed now, is that  
6 roughly where the one in five-year flow would come out  
7 if the curve continued in the same general slope?

8 A Yes.

9 Q I'll put a red square there.

10 In your one in five-year flow, wouldn't the habitat  
11 be about 45,000 square feet?

12 A Yes.

13 Q I'll put another red X (sic) there. In your one in two-  
14 year flow, it's 2,005 c.f.s.; is that correct?

15 A Right.

16 Q So that would be somewhere along this vertical line in the  
17 graph?

18 A Yes.

19 Q I'll just draw a red line along that.

20 Do you know where -- Well, you've indicated you can't  
21 tell for sure where your adult rainbow trout line would  
22 intersect the vertical red line; is that correct?

23 A Yes, that's correct.

24

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25 vogel-cross-white



1 Q If your adult rainbow line continued on in a linear  
2 fashion, wouldn't it strike the vertical red line about  
3 where my magic marker is pointed now?

4 MR. SACHSE: Objection, Your Honor.

5 MR. MEMBRINO: Your Honor, I would object to  
6 that. Mr. Vogel has already testified that he could  
7 only speculate without doing a computer runoff graph  
8 where that line might intersect, so I would object to  
9 inviting further speculation.

10 THE SPECIAL MASTER: I suppose I'll sustain it.  
11 Although it isn't going to make all that much difference.  
12 Obviously, the weighted usable area on that flow which  
13 is already in evidence has got to be somewhere down  
14 around there. But I'll sustain the objection simply  
15 because that is what the witness said.

16 MR. WHITE: Okay.

17 Q (By Mr. White) With respect -- pardon me, Your Honor.

18 THE SPECIAL MASTER: But I would say I think we  
19 could arrive at a fair and honest figure on the thousand  
20 square feet during a flow of that size once every -- during  
21 the flow of that speed. That's what you're trying to get  
22 at, isn't it, Mr. White?

23 Q (By Mr. White) Can you do that, Dave?

24 A I would say just speculation. It is probably somewhere  
25 vogel-cross-white



1 in that --

2 THE SPECIAL MASTER: All right. Okay. Then we'll  
3 forget it.

4 Q. (By Mr. White) Right in here?

5 A. Yeah --

6 THE SPECIAL MASTER: We'll forget about it if it  
7 takes speculation.

8 THE WITNESS: It is just guessing.

9 Q. (By Mr. White). Isn't it true that the same area of  
10 habitat which exists for your one-in ten-year flow is  
11 shown by an "X" at eleven hundred and thirty some odd  
12 c.f.s. also exists where the curve dips down again at  
13 roughly 325 c.f.s.?

14 A. Yes.

15 Q. And isn't it true that the same habitat that "X" exists  
16 at approximately the one-in-five-year low flow also  
17 exists at where the line continues to dip at approximately  
18 440 -- or excuse me --

19 THE SPECIAL MASTER: 240.

20 MR. WHITE: Excuse me, 4.4?

21 A. Yes.

22 Q. (By Mr. White) Isn't it true that the same habitat could  
23 be enjoyed under Mr. Keene's natural flow figures, his  
24 low flow figures at the one-in ten-year flow of 1131 c.f.s.

25 vogel-cross-white



1 would also be enjoyed at roughly 340 c.f.s.?

2 A. Uh-hugh.

3 Q. And isn't it true that the same habitat that was  
4 enjoyed at the one-in five-year flow, roughly three  
5 hundred and ninety some odd -- thirteen hundred and  
6 ninety some odd c.f.s., would also be enjoyed at  
7 roughly 260 c.f.s.?

8 A. Uh-hugh. Yes..

9 Q. But your flow recommendation was for 500 c.f.s., is  
10 that correct?

11 A. That's correct.

12 Q. Isn't it true then -- Well, let me ask one more ques-  
13 tion: If the rainbow adult line does continue to drop  
14 as you go to the right of the graph, wouldn't the c.f.s.  
15 at which the same habitat could be enjoyed as your one-  
16 in two-year natural flow or low flow also would be  
17 enjoyed at some c.f.s. less than 260?

18 MR. MEMBRINO: Your Honor, I object. We have  
19 already discussed --

20 THE SPECIAL MASTER: Objection is overruled. The  
21 precise question is right on. Right on the direct  
22 testimony on this.

23 THE WITNESS: Would -- I want -- I guess I don't  
24 understand exactly what you're getting at. I want to

25 vogel-cross-white



1 be sure.

2 Q (By Mr. White) So it is only for purposes of illustration.

3 Now, I'm going to ask you --

4 A. Okay. You're just referring to --

5 Q -- If, assume this line continues out in here someplace --

6 A. Okay.

7 Q -- and it hits your one-in-ten-year low flow -- excuse me,  
8 one-in-two-year low flow out near the red line at near,  
9 say, the 3.0 level for habitat --

10 A. Yes. I mean, like I said earlier --

11 THE SPECIAL MASTER: I thought that was 2.05, Mr.  
12 White?

13 MR. WHITE: Well, I'm sorry.

14 THE SPECIAL MASTER: Are you talking about-the-one-  
15 in-ten-year or the one-in-two-year?

16 MR. WHITE: I'm talking about the one-in-two. I  
17 apologize.

18 THE SPECIAL MASTER: Two thousand five.

19 MR. WHITE: That's two thousand five, and that's  
20 illustrated by the vertical red line.

21 THE SPECIAL MASTER: All right.

22 Q (By Mr. White) Mr. Vogel, if this line does continue  
23 to be depressed regardless of whatever the slope is,  
24 it is going to hit the one-in-two-year flow at a point  
25 vogel-cross-white



1 below which it hit the one-in-five-year flow and the one -  
2 in-ten-year flow, isn't that correct?

3 A. I believe that would be correct.

4 Q. And isn't it similarly true that when you go back to  
5 the amount of habitat which would -- the same amount  
6 of habitat on the other side of the curve where it  
7 starts down again, that would be at a flow of less  
8 than the 260 c.f.s.?

9 A. Yes, that would be likely.

10 Q. Isn't it true then that the flow of 500 c.f.s. which  
11 you have claimed for optimum habitat is far in excess  
12 of that habitat which existed, according to Mr. Keene's  
13 flow values at natural flow levels, whether they are  
14 one-in-two, one in five or one in ten?

15 A. If I understand your question correctly, you are saying  
16 that if flows did naturally occur in those levels I  
17 have listed in my report as in a one-in-two, one in five  
18 or one-in-ten-year recurrence interval, it would be true  
19 that there would be less actual physical habitat for an  
20 adult rainbow trout than there would be at 500 -- optimum  
21 habitat than there would be at 500 c.f.s.

22 THE SPECIAL MASTER: How often?

23 MR. WHITE: Every one-in-two, one-in-five or one -  
24 in-ten years.

25 vogel-cross-white



1 THE SPECIAL MASTER: Of course. That's the whole  
2 point.

3 Q (By Mr. White) Isn't it that right?

4 A Right.

5 Q Yeah.

6 A As I stated earlier, there isn't a linear relationship  
7 between increases in flow and increases in fish habitat.  
8 For example, we could extend this way on over there to  
9 high flows, flood flows. You know, it is just common  
10 sense that we are not going to have optimum fish habitat  
11 at three times the amount that would occur in an average  
12 year. Again, we are talking about optimum habitat  
13 conditions for adult rainbow trout only.

14 THE SPECIAL MASTER: Yes. But the purpose for  
15 his reasoning -- the reason for his questions on cross-  
16 examination are these: That if a figure between May  
17 and October were 410 instead of 500, when you figure  
18 that it is not going to affect your difference much in  
19 optimum habitat, once every two years, and in even less,  
20 once every five and once every ten, aren't you reasonably  
21 content to say that the figure 410 or 395 is just as  
22 effective and accurate as your 500? That's about what  
23 Mr. White is trying to work out.

24 MR. WHITE: I have another point too, Your Honor,  
25 vogel-cross-white





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to make.

Q (By Mr. White) The other point is: Out of fairness to the witness, so he can respond to both of them, is that if Mr. Keene's flows are right, if these are the natural flows that existed at the time of the reservation, then the natural habitat that existed at the time of the reservation was far less than what Mr. Vogel identified as the optimum habitat, or the flow required to meet the natural habitat would also be far less than the optimum habitat, and it is a significant order of magnitude because when you get to the one-in-five-year low flow habitat, you're down to half the amount of water that has to remain in the stream, as Mr. Vogel testified would be there under optimum conditions.

THE SPECIAL MASTER: What I would like to see is what is the flow, not the virginal flow, but what is the flow as it has been the last twenty-five, thirty or thirty-five years with the irrigation requirements for the historic period, because that's more closely to the truth of the state of nature on the reservation today, and that isn't in evidence.

MR. WHITE: No. I'm just -- I'm forced to work with Mr. Keene's values, Your Honor, and I'm trying to point out that at his values the habitat that the fish

vogel-cross-white



1 had in 1868 was far less than what Mr. Vogel identified  
2 as the optimum habitat.

3 THE WITNESS: Might I make a point too, Your Honor?  
4 Again, we've got to look at the large picture in this  
5 whole habitat analysis. I stated previously that this  
6 methodology does not address flushing flows. Usually  
7 in the months of May and June, early in the peak runoff  
8 periods of Wyoming -- or in Wyoming, in these rivers,  
9 flushing flows do occur. We did not even address that  
10 in the methodology. I believe there's been considerable  
11 amount of research done as far as what flows are necessary  
12 to remove certain volumes of sediment from the streams  
13 and things such as this. I'm not addressing that at  
14 all in this habitat. I'm just simply stating that those  
15 flows -- say, for example, you have here a 500 c.f.s.  
16 would maximize the life habitat for simply brown trout  
17 in adult trout life history stages. It is quite possi-  
18 ble that we could require a higher flow, and in that  
19 sense, we are just being -- we are not addressing them,  
20 though, we are just being conservative and just limiting  
21 ourselves to just the adult life history stages.

22 Q (By Mr. White) But, Mr. Vogel, isn't it true that the  
23 work done by the alluvial geomorphologists indicated  
24 that flushing flows really needed to occur for durations

25 vogel-cross-white



1 of no more than three or four days and move the sediment  
2 downstream only about a major pool or two?

3 A. I couldn't answer that. I'm not familiar with that.

4 Q. You don't know?

5 A. I do know that as far as the life history of fish though,  
6 that flushing flows may be very important at certain  
7 times depending on where they spawn. Because if the  
8 sediment settles into the interstices of the gravel,  
9 into the small spaces of the gravel where the eggs are  
10 incubating, it is potentially possible it could suffocate  
11 the eggs. The eggs have to have a flow of water coming  
12 through them, but we didn't address that in this study.

13 Q. Isn't it true that you did not know whether or not once,  
14 or if, the other federal claims, the consumptive use  
15 claims, should be granted and exercised, whether there  
16 would be sufficient water remaining for flushing flows?

17 THE SPECIAL MASTER: I think he said he didn't  
18 consider that.

19 THE WITNESS: Right.

20 Again we are saying that we recognize the fact  
21 that fish don't necessarily need every drop of water  
22 in the stream. You know, we're just trying to limit,  
23 we're just trying to identify three physical features  
24 to optimize physical habitat: velocity, depth and substrate,  
25 vogel-cross-white



1 and we want to do so in a combination of each of them  
2 and limited them to just the adult life history stages  
3 for both brown trout and rainbow trout such that we  
4 can state what we think the optimum habitat will be.  
5 For example, out here it's quite possible that these  
6 higher flows might inundate more area on the stream.  
7 Referring back to a previous exhibit, Exhibit C-283,  
8 it's quite possible that those higher flows might  
9 actually rise up over some of these areas and inundate  
10 more substrate and maybe make this depth more prefer-  
11 able, but the velocities in the area where the fish  
12 are living might be so high that they would -- they  
13 wouldn't prefer that habitat. So oftentimes, it does  
14 occur that fish do prefer lower flows.

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1 Q (By Mr. White) Isn't --

2 THE SPECIAL MASTER: One thing's clear and this  
3 evidence shows it again, is that just because you have  
4 a higher velocity or more volume doesn't mean you're  
5 improving the fish habitat at all.

6 THE WITNESS: That's right.

7 Q (By Mr. White) And isn't it also true, Mr. Vogel, in  
8 situations such as that illustrated by FISH-284, that  
9 the habitat of the fish under the natural flow conditions  
10 established by Mr. Keene was much less than the optimum  
11 habitat which you derived?

12 A It works on both ends of the scale. You know, there's --  
13 it's quite possible more water could damage the fish  
14 habitat just as less water may damage the fish habitat.

15 Q Isn't it true that the same reduction from optimum to,  
16 shall we call it natural habitat, would also occur with  
17 similar reductions from the flow required for optimum  
18 to natural habitat in a number of other reaches for which  
19 you have made recommendations in your report?

20 THE SPECIAL MASTER: Can I hear that question  
21 because I got lost?

22 MR. WHITE: I'll try it again.

23 THE SPECIAL MASTER: No, let her repeat it, Mr.  
24 White, unless you want to strike it.

25 vogel-cross-white



1 MR. WHITE: No, that's okay. Everybody lives in  
2 fear of what their spoken words look like in print.

3 (Thereupon the following  
4 (question was read back as  
5 (follows: "Isn't it true that  
6 (the same reduction from  
7 (optimum to, shall we call it  
8 (natural habitat, would also  
9 (occur with similar reductions  
10 (from the flow required for  
11 (optimum to natural habitat  
12 (in a number of other reaches  
13 (for which you have made  
14 (recommendations in your  
15 (report?"

16 MR. WHITE: You want me to try again, Your Honor?

17 THE SPECIAL MASTER: You want to try it again?

18 Q (By Mr. White) Isn't it true that for other reaches in  
19 your report, the same type of thing would occur, in that  
20 the natural habitat at the various natural flows supplied  
21 by Mr. Keene would be less than the optimum habitat which  
22 you identified and that the flows to require, or to  
23 maintain, flows to maintain the natural habitat would be  
24 less than those which are required to maintain the optimum  
25 habitat?

A I believe that was the case on only those reaches on the  
Big Wind River. I think on most of the tributaries --

THE SPECIAL MASTER: But with those volumes, isn't  
that almost crucial to your case? You see your volumes  
in the Big Wind are really something, you're talking

vogel-cross-white



1 390 to 500 cubic feet per second, 384 to 500, 250 to 325,  
2 249 to 500, these here, and if you look down in the 1980s  
3 and 1577 and 1410's, that's the guts of the claim for  
4 fish habitat is the Wind, the Big Wind, the Wind River,  
5 more than all the other -- You got about five reaches on  
6 that, haven't you, or six, and I'd say they're more  
7 important than the other eleven, is that generally a true  
8 statement, with the exception of maybe the Canyon?

9 THE WITNESS: What do you mean the Canyon?

10 THE SPECIAL MASTER: Forget my question, I'm  
11 generalizing now, and I shouldn't do that.

12 Q (By Mr. White) Isn't it true that that would occur on  
13 Reaches 9, 10, 11, 13, 15 -- excuse me --

14 THE SPECIAL MASTER: Let's take them down, why don't  
15 you, Mr. Vogel, and have a look at them while he calls  
16 them off.

17 MR. WHITE: I'm not sure I can give the reach numbers,  
18 I've got the pages in the report.

19 (Brief pause.)

20 Q (By Mr. White) It would be true with respect to Reach 2  
21 as would appear from the graph on Page 28 of Exhibit C-280,  
22 Reach 3 would appear from the graph at Page 31 of  
23 Exhibit C-280, Reach 4 as would appear from the graph,  
24 Pages -- Page 36 and 38 of C-280; Reach 5, Page 42;

25 vogel-cross-white



1 Reach 6, Page 46; Reach 7, Page 75, and Reach 16, Page 86.

2 A Did you say Pages 75 and 76?

3 Q Seventy-six and 86. And I will agree with you if you  
4 say that 86 is a real close question.

5 THE SPECIAL MASTER: And a real small stream.

6 THE WITNESS: What about Page 76, do you also say  
7 it's a close question there?

8 Q (By Mr. White) No, because according to my review, it  
9 would appear that between the claimed amount and the  
10 natural habitat at the one in ten-year flow, there would  
11 be a reduction from roughly 208 c.f.s. to 95 or so.  
12 Those are just rough approximations.

13 A I lost you in that last one. Why don't you show me what  
14 you're referring to.

15 Q Tell me the ones where you agree, for starters.

16 A Okay. I believe the reaches in the Big Wind River.

17 Q Could you just give us the numbers of those upon which  
18 you have agreed?

19 A The numbers 1, 2, 3, 4, 5 and 6.

20 THE SPECIAL MASTER: That's what you said.

21 MR. WHITE: I think, to save time, Your Honor, we'll  
22 come back to the others in our case in chief.

23 Q (By Mr. White) Mr. Vogel, isn't one of the advantages of  
24 the Incremental Methodology is that you can predict a  
25 vogel-cross-white





- 1 flow required to maintain different levels of habitat,  
2 even levels less than the optimum level or optimum amount?
- 3 A Please -- I think I understood you, I just want to be sure.  
4 Would you please restate that?
- 5 Q Isn't it true that one of the strengths of Incremental  
6 Methodology is that you can predict flows which are  
7 necessary to maintain habitat at less than optimum habitat?
- 8 A Well, understand we're not trying to predict flows, we're  
9 trying to predict habitat.
- 10 Q I understand, but after you predict habitat, then you drop  
11 down the graph and get the flow?
- 12 A Right.
- 13 Q I'm sorry I went around the loop too quickly. But it is  
14 right that you can develop less than optimum habitat, and  
15 after that less than optimum habitat, you can so identify  
16 the flow required?
- 17 A Yes. The methodology enables you to predict Incremental  
18 changes in habitat with Incremental changes in flow.
- 19 Q In fact that was one of the reasons why the methodology  
20 was adopted, wasn't it?
- 21 A Right.
- 22 Q So if one were to determine that instead of optimum  
23 habitat in a particular reach he or she wanted to maintain  
24 80 percent of that habitat, it would be possible to  
25 vogel-cross-white



1 determine the amount of flow required to maintain that 80  
2 percent of habitat; isn't that correct?

3 A Eighty percent of what habitat?

4 Q Optimum.

5 A Okay. Make sure you understand now that we're trying to  
6 predict what the optimum habitat would be for an inflow.  
7 Each one of these points on Exhibit 284 represents the  
8 optimum habitat that's actually present in the stream at  
9 that flow. So each one of those points represents the  
10 optimum habitat in terms of velocity, depth and sub-  
11 strate. And this is the point we're trying to maximize,  
12 that optimum habitat.

13 Q In order to maximize the optimum habitat on Exhibit C-284,  
14 you picked the top of the adult curve; is that correct?

15 A Right.

16 Q And that maximum, optimum habitat would be in this case  
17 600 c.f.s.?

18 A Right.

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1 Q And it would be possible to drop off of the roughly  
2 66,000 square feet of weighted useable area of  
3 habitat by 80% down to a lesser figure of habitat,  
4 come across, intersect the curve and develop the flow  
5 required to maintain 80% of the maximum habitat,  
6 isn't that correct?

7 A Right.

8 Q Let's take a look at an example. I hand you what  
9 has been marked --

10 MR. WHITE: It hasn't been marked for identifica-  
11 tion. Can you give me an exhibit number?

12 It's been marked for identification as FISH-50  
13 and if I might have a moment, I'll get the others  
14 marked for the Court and counsel.

15 Q (By Mr. White) And I'll ask you whether or not that  
16 exhibit contains pages 78 and 79 out of your report,  
17 which have been pasted together so that they fall  
18 directly in line with page 78 at the top and page 79  
19 at the bottom?

20 A Yes, it does.

21 Q For this particular reach, as I recall your claim was  
22 for a hundred and -- your optimum flow required for  
23 the optimum maximum habitat was 110 cfs?

24 THE SPECIAL MASTER: Maximum: 1400.

25 Off the record.  
vogel-cross-white



(Off the record discussion.)

- 1
- 2 Q (By Mr. White) A hundred and ten, I believe, on
- 3 page 77.
- 4 A. What was the question?
- 5 Q Isn't it true that your optimum habitat determined
- 6 for this, or recommended for this reach, was maintained
- 7 at a flow of 110 cfs, as shown on page 77?
- 8 A. Yes. The recommended flows during the months of May,
- 9 June, July and August were set forth as 110 cfs.
- 10 Q Well, let's just consider those months, then for the
- 11 following series of questions, and I ask you if it
- 12 isn't true that with respect to the bottom graph for
- 13 rainbow trout, the optimum habitat which you identi-
- 14 fied was roughly 9,200 square feet?
- 15 A. For which life history stage?
- 16 Q Adult.
- 17 A. Rainbow trout adult?
- 18 Q Yes.
- 19 A. Yes, that would be approximately correct.
- 20 Q Isn't it true that if you reduced that by 80% the
- 21 habitat amount by 80%, that would drop you down to
- 22 somewhere around 7400 square feet?
- 23 A. Repeat -- if it was reduced 80% of 110?
- 24 Q No, reduced by 20%.
- 25 vogel-cross-white



1 THE SPECIAL MASTER: Two percent, or 20%?

2 MR. WHITE: Twenty percent, Your Honor. We  
3 have an optimum habitat of about 9200 square feet  
4 and we would reduce that to 80% of its value, or  
5 reduce it by 20%, it would drop it down to about, say,  
6 7400 square feet.

7 Q (By Mr. White) Is that correct?

8 A. What is the flow -- What is that flow when it is  
9 reduced?

10 Q Well, why don't we find out if we have gotten down to  
11 that habitat value?

12 A. Well, the figures I show for that, which would put  
13 it in the ball park, are still above 8,000, rather  
14 than 7,000.

15 Q Would you take -- Reduce 9200 square feet by 20%.  
16 Doesn't that get you down in the 7,000 area?

17 A. Oh, okay. I'm sorry. I thought you were reducing  
18 the flow.

19 Q No, I'm not reducing the flow. I'm concentrating on  
20 the habitat.

21 A. I'm sorry. I misunderstood what you were saying.

22 Yes, that would put it in that ball park.

23 Q And, isn't it true that at 80% of the optimum habitat,  
24 or for 80% of the optimum habitat, the required flow

25 vogel-cross-white



- 1 would be somewhere around 25 cfs?
- 2 A. Okay. Make sure you directly state that. Now you're
- 3 talking about 80% of the optimum habitat?
- 4 Q. Yes sir.
- 5 A. That's present at 110 cfs?
- 6 Q. That's correct.
- 7 A. That doesn't necessarily have to be the optimum
- 8 habitat, or -- It has not necessarily maximized the
- 9 total habitat in the stream.
- 10 Q. I understand that's the --
- 11 A. Because, in this particular example, 110 cfs was the
- 12 highest limit we could extrapolate our information
- 13 to. It is quite possible that adult habitat may be
- 14 increasing beyond that.
- 15 Q. But it is just like on Exhibit C-284, it would be
- 16 beyond the right side of the graph and would be
- 17 speculation, wouldn't it?
- 18 A. Right. That's why I don't want to speculate that it
- 19 would be below the optimum habitat available for the
- 20 fish. It is only the optimum habitat present at
- 21 110 cfs.
- 22 Q. Isn't it true that if you reduced the optimum habitat,
- 23 which is available at your recommended flow, we've
- 24 reduced that habitat by 20%, the amount of flow
- 25 vogel-cross-white



1 required drops from 110 cfs to around 25 cfs?

2 A. In other words --

3 Q. In other words, reduction of habitat of 20% reduces  
4 the amount of water required to be kept in the stream  
5 by about 75%?

6 A. Yes, that -- Those figures would be pretty close,

7 I might point out this is a very good example  
8 to use why the fishery biologist has got to be the  
9 final person to make the recommendation here. This,  
10 again, is a tool. I have to apply what I actually  
11 know, going out and looking at the stream as it  
12 actually exists. What I would like to do here, if I  
13 may, is draw just kind of a generalized cross-section  
14 of what this particular creek looks like, because it  
15 is pretty unique.

16 MR. WHITE: Why don't you lift up that page,  
17 where you've got your seven points on, or is that a  
18 solid foam board?

19 (Off the record discussion.)

20 THE WITNESS: May I borrow your marking pen?

21 MR. WHITE: Yeah. Here you go, Dave.

22 THE WITNESS: Okay. Dinwoody Creek, I believe,  
23 has a unique stream morphology. It doesn't necessarily  
24 follow the contours as depicted on Exhibit 283. It's  
25 vogel-cross-white



1 a highly boulder-strewn stream. It's got a  
2 tremendous amount of fish habitat, I believe, in  
3 essentially a central channel that's coursing through  
4 the major portion of the streambed. If I was going  
5 to draw just a rough example of what the streambed  
6 may look like, this would be the brush on either bank.  
7 This would be the edge of the channel. The channel  
8 would be down here. Okay, this channel right here,  
9 represents -- Or, the entire channel from here to here  
10 represents the true streambed. However, there is  
11 another channel that courses right through the center  
12 of the stream. Okay, this area, especially during  
13 low flow months like during the winter, is the area  
14 that has water in it. There's no water at that time  
15 of the year, like during the winter months, up in  
16 this upper level. Okay. As you increase the dis-  
17 charge, it starts -- These are all boulders, by the  
18 way, all the way across. As you increase the discharge,  
19 it starts to rise up into the area. It starts to  
20 inundate this higher terrace of the streambed. I'll  
21 depict it as this. When it does that, it is very  
22 important to note here, because it inundates a  
23 tremendous amount of habitat that's now available for  
24 fry and juvenile life history stages.

25 vogel-cross-white





1 THE SPECIAL MASTER: For fry and juvenile what,  
2 life history --

3 THE WITNESS: Stages. Life history stages.

4 If we refer back again to FISH-50, looking at  
5 the brown trout curve on the top, I believe this is  
6 exactly why, if you look at both the fry and the  
7 juvenile curves, depicted by the circles and the  
8 triangles pointed downwards, you can see there is a  
9 tremendous juvenile increase in habitat. For this  
10 reason, I believe it is why this habitat is drastically  
11 increased. However, this habitat does not necessarily  
12 have to coincide with the adult habitat. I believe  
13 that these higher flows, it is still too shallow for  
14 adults to go in there, but it is a tremendous amount  
15 of increase for adult -- I mean, excuse me, for fry  
16 and juveniles for habitat for brown trout.

17 Because of this reason, because of actually see-  
18 ing and stream and the unique nature of it, we use  
19 the fry and juvenile life history stages to base our  
20 recommendations. So, once again, this methodology is  
21 intended to be a tool, something we can actually look  
22 at, get some physical habitat features, and apply it  
23 to what we actually see in the field, use our know-  
24 ledge as a fishery biologist, to make our final recommendation.

25 vogel-cross-white



1 THE SPECIAL MASTER: Where would the line for the  
2 high water mark be for May or June or July on Dinwoody  
3 Creek, higher than the two banks on the left and right,  
4 in the brush?

5 THE WITNESS: No, it would still be lower.

6 Q (By Mr. White) Mr. Vogel, for that particular reach, isn't  
7 it true that you don't know populations of fry and  
8 juvenile which occur there?

9 A That's -- I'm sure they occur there because there's  
10 natural occurring salmon there and we have not stocked that  
11 stream with brown trout or rainbow trout.

12 Q Natural occurring what?

13 A I'm sure that the fry and juvenile would naturally occur  
14 because we have population of brown trout and rainbow  
15 trout, so they have to be spawned, they have to go through  
16 their young stages to become adults. So, in other words,  
17 we know that the fry and juvenile would have to occur.

18 Q Couldn't they occur in some other reach, for example,  
19 with the adults migrating in that area?

20 A No, I don't believe so.

21 MR. WHITE: Okay. Your Honor, I'd like to take a  
22 short break if we might because I'm trying to figure out --

23 THE SPECIAL MASTER: It's a good time for one. All  
24 right, a short break.

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(was taken.

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THE SPECIAL MASTER: Mr. White, proceed, please.

We'll come to order.

Q (By Mr. White) Mr.. Vogel, I direct your attention to what has been admitted as United States Exhibit C-7, and I would like you to assume that this is an exhibit showing aesthetic areas within which the United States have claimed -- has claimed the entire flow of the streams. And with that assumption, ask you whether or not your Reaches, Numbers 16, 8 in their entirety, as well as portions of Reaches 10 and 11, fall within those aesthetic areas?

A What did you say besides 16?

Q All of 16 and 8.

A And 8.

Q And parts of 10 and 11.

THE SPECIAL MASTER: Mr. White, why is 6 omitted?

MR. WHITE: It seems that 6, Your Honor --

THE SPECIAL MASTER: A bit highway going through it or canyon?

MR. WHITE: It has a gap running right through it for the river.

\* \* \* \* \*

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- 1 A Okay, you said 16, all of 16, all of 8 and parts of 10  
2 and 11?
- 3 Q (By Mr. White) Yes, sir.
- 4 A Yes, that's true.
- 5 Q Did you coordinate your work with Rich Harbour through  
6 whom Exhibit C-7 was introduced?
- 7 A I did not have any input or any portion of the development  
8 of the aesthetics claim.
- 9 Q Mr. Vogel, I hand you two documents which have been  
10 marked as FISH-280-77-A as well as an unmarked copy of  
11 a manual entitled Compilation of Records of Surface Water  
12 of the United States Through September 1950 Part 6A,  
13 Missouri River Basin Above Sioux City, Iowa, Geological  
14 Survey Paper 1309 and I'm going to take away the water  
15 supply paper and let your lawyers look at it.
- 16 (Brief pause.)
- 17 Q I give you the water supply paper since you may want to  
18 refer to it in answering the next series of questions.
- 19 THE SPECIAL MASTER: Wyoming -- Plaintiff's  
20 Exhibit 280-77-A?
- 21 MR. WHITE: Yes, sir. That's because it relates to  
22 information on Page 77 of Exhibit C-280, Mr. Vogel's  
23 report.
- 24 Q (By Mr. White) Mr. Vogel, have you had a chance to check  
25 vogel-cross-white



1 to see whether or not the second page of Exhibit FISH  
2 280-77-A contains the information found on, or a copy of  
3 the Pages 204 and 205 in the water supply paper?

4 A Those pages are different. They don't match the same ones.

5 MR. WHITE: Well, let's look at it to make sure I  
6 haven't -- It looks like heads are going to roll.

7 Hold on just a second.

8 (Brief pause.)

9 MR. WHITE: Let's come back to that one. I think the  
10 next one is right and we'll get it corrected.

11 I apologize, Mr. Vogel. We got the wrong cover  
12 sheet xeroxed there and we'll replace the cover sheet.

13 THE SPECIAL MASTER: If you tear it off you might not  
14 even need it.

15 MR. WHITE: It has the exhibit number on it, Your  
16 Honor. We can change that later. I'm sure I can come to  
17 an accomodation with the United States.

18 THE SPECIAL MASTER: All right.

19 Q (By Mr. White) Now, I hand you Water Supply Paper,  
20 Geological Survey Water Supply Paper 1729, which covers a  
21 period October '50 to 1960, and ask you whether or not  
22 the pages, the second page of Exhibit 77-A complies and is  
23 a copy of Pages 204 and 205 of that water supply paper?

24 A Yes, I believe they are.

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Q Isn't it true that the gauge for Dinwoody Creek near  
Burris on Page 204 is within the claim reach which  
appears on Page 77 of your report and which, I believe,  
is Reach No. 9 or is that 15, 16 --

THE SPECIAL MASTER: Fifteen.

MR. WHITE: Fifteen?

A Yes.

\* \* \* \* \*

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1 Q (By Mr. White) Isn't it true that during the year 1955,  
2 your recommended flows are greater than the gauged flow  
3 for all months save June, July and August?

4 THE SPECIAL MASTER: Could I hear that question again?

5 MR. WHITE: Let me try it again.

6 Q (By Mr. White) Referring to Page 77 of your report,  
7 Exhibit C-280, isn't it true that the gauged flows for  
8 1955 are less than your recommended flows for each month  
9 save June, July and August?

10 THE SPECIAL MASTER: You mean the average discharge?

11 MR. WHITE: Yes, sir. It would be the monthly and  
12 yearly mean discharge in c.f.s., Your Honor, the first  
13 block-table on Page 204.

14 (Brief pause.)

15 THE WITNESS: Yes, that's true.

16 Q (By Mr. White) And up towards the top of Page 204, which  
17 is the second page of Exhibit 280 --

18 THE SPECIAL MASTER: Top page of what?

19 MR. WHITE: 204, which is the second page of exhibit --

20 THE SPECIAL MASTER: I see.

21 MR. WHITE: Exhibit --

22 THE SPECIAL MASTER: I beg your pardon.

23 Q (By Mr. White) Exhibit C-280, about a third of the way  
24 down, under the headings of streams, do you find the  
25 vogel-cross-white



1 notation that there was no flow from May 8th through  
2 May 13, 1955 in that reach or at that gauging station?

3 A Yes, that's true.

4 Q What happens to or what would happen to fish habitat, if  
5 you know, during 1955 except for the months of June, July  
6 and August, in that particular reach?

7 A There would obviously be a very severe reduction of fish  
8 habitat. However, I might point out that it does not  
9 necessarily mean there would be a total elimination of  
10 fish habitat. Dinwoody Creek, as I know it, has numerous  
11 places where there's pools, things like that, that could  
12 be lethal to the fish if it were during warm parts of the  
13 year. However, in May in Wyoming I believe it could have  
14 been possible for fish to survive over a period of five  
15 days, five or six days.

16 Q What is meant in your report by M.M.F., which I believe  
17 is mean monthly flow?

18 A It's -- Yes. Mean monthly instantaneous flow in c.f.s.

19 Q Is that -- Does that mean that you simply would want an  
20 average flow of the amount you recommended, so that it  
21 could vary significantly from the mean and so long -- from  
22 day to day, but at the end of the month if that mean had  
23 been accomplished, your recommended flows would have been  
24 satisfied?

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1 A Well, ideally what we want and what I would like to see  
2 in this situation is a situation where you don't have an  
3 extreme, you would have half the month with twice the  
4 mean and half the month with no flow, particularly in  
5 those months that may be in say July, August or September.  
6 Our whole purpose in that is try to get it within the  
7 ballpark of that mean so there wouldn't be extreme  
8 fluctuation, if we could possibly avoid it.

9 Q Well, for Reach 15, that's on Page 77 of your report, you  
10 have a recommended mean monthly instantaneously flow of  
11 15 c.f.s. for January. In using your definition, wouldn't  
12 that be satisfied if during half the days of the month --  
13 if there were only even numbered days in January -- but  
14 during half the days in January you had zero flow and  
15 half the days of the month you have 30 c.f.s.?

16 A To come up with an average of 15?

17 Q Yes.

18 A Yes.

19 THE SPECIAL MASTER: You think that would be  
20 satisfactory?

21 THE WITNESS: Oh, I thought he said isn't it possible.

22 MR. WHITE: No, I didn't ask him if it was satisfactory.  
23 I asked him wouldn't he arrive at his recommended mean  
24 monthly flow using that illustration. He didn't say it  
25 vogel-cross-white



1 was satisfactory.

2 THE SPECIAL MASTER: I see.

3 THE WITNESS: Again we're trying to, the situation  
4 we would like to have occur is not something like that.

5 THE SPECIAL MASTER: You want the fluctuations.

6 THE WITNESS: Well, we don't want to have extreme  
7 situations. In other words, if a fishery biologist comes  
8 up to a person who's managing the water and the person  
9 managing the water says, What's your flow recommendation,  
10 if we just give him a figure of 100 c.f.s. for a mean,  
11 you know, it's quite possible that half the month they  
12 could have twice that amount of water and twice that  
13 amount -- or excuse me --

14 THE SPECIAL MASTER: Half.

15 THE WITNESS: We could have half that, at zero flow,  
16 so we may not accomplish anything. So our objective is  
17 to try to prevent those extremes from happening.

18 Q (By Mr. White) What sort of fluctuations would be  
19 acceptable or would be -- would be acceptable to you and  
20 still be satisfactory on either side of that mean monthly  
21 flow? Let's stick with the example of 15 in January so  
22 we have something to talk about.

23 A Well, it would depend on a site specific basis, it would  
24 depend on the time of year, depend on the temperature of  
25 vogel-cross-white



1 the air, depend on whether there had been serious  
2 reductions previously to that. There's a tremendous  
3 amount of factor that would be involved.

4 Q Well, assuming that the -- I'd like you to assume that  
5 the Master would order that this reach was entitled to  
6 15 c.f.s., M.M.F. during January and that the State was  
7 to administer that particular right, how would that  
8 administration be done? What sort of fluctuations would  
9 be acceptable?

10 A That would be -- myself, I would say that would be up to  
11 the fishery management, biologist managing that system  
12 at that particular time. It would be up to their  
13 judgment.

14 THE SPECIAL MASTER: What works are there upstream  
15 of the gauge that would -- that could be used to affect  
16 the levels of the river, of the stream?

17 THE WITNESS: As I understand, Dinwoody Lakes does  
18 have a little bit of a manmade structure there.

19 THE SPECIAL MASTER: But you see your figures from  
20 Page 77 are for flows in the creek below Dinwoody Lakes,  
21 and I can't tell from Page 204 of this exhibit where  
22 this gauging station is located, where it is. I got the  
23 elevation, it's 6196, and I guess from that we can tell  
24 whether it's downstream of the lake or upstream of the lake

25 vogel-cross-white



1 if we know the elevation of the lake.

2 Q (By Mr. White) Well, isn't the very large Dinwoody Canal  
3 located upstream of that gauge?

4 A I believe it was, the best I can remember. I don't know  
5 if Dinwoody Canal is very large, but there is an  
6 irrigation canal in Dinwoody Creek.

7 THE SPECIAL MASTER: Diversions above the station  
8 for irrigating of about 1,700 acres below the station  
9 has occurred since 1936. You have a natural regulation  
10 by Dinwoody Lake and other small lakes.

11 What is the date of this publication, do you know,  
12 or the latest --

13 MR. WHITE: Dave's got it on his --

14 THE WITNESS: It says --

15 MR. WHITE: -- stand.

16 THE WITNESS: Looks like it was printed in 1964.

17 Q (By Mr. White) Well, let's get back to the question.

18 THE SPECIAL MASTER: You say you are happy if I  
19 were to order 15 c.f.s. for the month of January in this  
20 stream?

21 THE WITNESS: Yes.

22 THE SPECIAL MASTER: Even though I know that on some  
23 given years, like three out of every eight years that  
24 you're not going to have that much of a flow?

25 vogel-cross-white



1 THE WITNESS: No. Remember, Your Honor, that if  
2 there was a naturally occurring flow lower --

3 THE SPECIAL MASTER: You accept that?

4 THE WITNESS: We would accept that.

5 Q (By Mr. White) Isn't it true that the Dinwoody Canal is  
6 upstream of the gauge and your 15 c.f.s. -- and let's  
7 assume that it's diverting during January, which may not  
8 be appropriate, but sometimes there are diversions in the  
9 winter -- wouldn't you expect that the Dinwoody Canal  
10 diversions would be curtailed in order to meet the 15  
11 c.f.s.?

12 A To meet the 15 c.f.s. mean?

13 Q Yes.

14 A Yes. Like you say, if it was occurring during the winter  
15 time, yes.

16 Q But under your definition of mean monthly flow,  
17 instantaneous flow, the State Engineer could regulate  
18 that canal just to deliver 30 c.f.s. for half the days  
19 of the month and zero c.f.s. for the remainder, isn't  
20 that true?

21 MR. SACHSE: Objection. He's made that clear that  
22 he stated in a mean, but the desirable thing is to keep  
23 it close to the middle and not have it all at one time.

24 MR. WHITE: The problem is, Your Honor, the  
25 vogel-cross-white



1 United States seeks for you to enter a decree, which,  
2 it's possible, that the State Engineer, and it's certain  
3 that someone's going to have to administer it. And it  
4 occurs to me that it might be appropriate to inquire as  
5 to the administration of that decree from the very person  
6 upon who the claims -- or very person upon whose testimony  
7 the claims are based. It seems it would appear that there  
8 is a very large question mark in how these flows would  
9 be administered if they were granted, especially since  
10 they are greater than the gauged flows. I think it's a  
11 fair question to ask this witness, what sort of upstream  
12 administration is necessary to preserve the types of flow  
13 he finds necessary for the purposes that he's testified,  
14 what sort of variations would be acceptable, for example.  
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THE SPECIAL MASTER: Well, all right. Answer this much of the question: What sort of variation would be acceptable under an order, say, of 15 cubic feet per second in a given stream, in the month of January?

THE WITNESS: I believe the question --

THE SPECIAL MASTER: What latitude would you allow a State Engineer administering that water to do?

THE WITNESS: That would take more work on my part. Quite frankly, Your Honor, I would have to do some more work on an analysis to come up with my recommendation.

THE SPECIAL MASTER: One thing for certain is you would not approve a 30 cubic foot flow for 15 days consecutively and then no water for 15 days?

THE WITNESS: That's correct.

THE SPECIAL MASTER: All right. That, I think, states the understanding of it.

MR. WHITE: Well, let's leave gauging flow and go on to another area, then. If you would like, Your Honor, we can continue with this gauging flow analysis, but I'm trying to cut it off --

THE SPECIAL MASTER: No, I appreciate it if we could crack it up today.

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1 MR. WHITE: Well, we -- I told Mr. Echohawk that  
2 I would get only to areas that I would identify to  
3 him tomorrow, so he would be free to go to a meeting.

4 THE SPECIAL MASTER: All right.

5 MR. WHITE: And I'm trying to meet that obligation.  
6 If you want to go on through the gauges, we can go on  
7 for some time, but --

8 THE SPECIAL MASTER: No, I prefer to go along  
9 the lines you have.

10 MR. SACHSE: Could I inquire at this time, is  
11 there any possibility if we stay an hour late this  
12 evening, Mr. White could finish his cross-examination  
13 today.

14 MR. WHITE: I think it is unlikely. We can stay  
15 until 7:30 or 8:00, and I might be able to get it  
16 done. I'm going to take a day and a half, roughly,  
17 and perhaps a smidgen more.

18 THE SPECIAL MASTER: Well, I frankly would rather  
19 adjourn at five, than go to 7:30 or 8:00, and still  
20 not be sure if we're going to have tomorrow.

21 MR. WHITE: Perhaps during the next break --

22 THE SPECIAL MASTER: If you have to go until  
23 eight o'clock tonight, you're not going to catch a  
24 plane out of here, anyhow.

25 vogel-cross-white





1 MR. SACHSE: No. That's all right.

2 MR. WHITE: During the break I could explain to  
3 Harry the areas I'm going to get into tomorrow, and  
4 he may not want to be here tomorrow.

5 MR. SACHSE: No, I'll be here.

6 MR. WHITE: In fact, I'll do it right now.

7 (Brief pause, followed by an  
8 (off the record discussion.

9 THE SPECIAL MASTER: Do you anticipate, Mr.  
10 White, and, Mr. Membrino, that this decree should  
11 speak to every stream of the Statement of Claims and  
12 to every month of the flow in that stream, somewhat  
13 in the fashion of answering every one of the, not  
14 reaches, but rivers, in the Statement of Claims from  
15 page 5 through page 9?

16 MR. MEMBRINO: Yes, Your Honor. As amended.

17 THE SPECIAL MASTER: And, Mr. White, what is your  
18 answer to that question?

19 MR. WHITE: Yes. If the State Engineer has to  
20 administer it, Your Honor, we would like an administer-  
21 able decree.

22 THE SPECIAL MASTER: Stream by stream, foot by  
23 foot?

24 MR. WHITE: Yes sir.

25 vogel-cross-white



1 MR. MEMBRINO: As the instantaneous stream flow,  
2 it is important in this situation.

3 THE SPECIAL MASTER: Okay. You haven't added  
4 to my joy this afternoon, but I understand you.

5 I'll have you submit what you feel is the --

6 MR. MEMBRINO: Of course, we are not assuming  
7 the State Engineer is going to be the one ending up  
8 administering this water.

9 MR. WHITE: I was assuming that, Your Honor.  
10 I wasn't suggesting that that was the case, it is  
11 just that I have a certain tenderness for the State  
12 Engineer.

13 THE SPECIAL MASTER: I was just wondering whether,  
14 given these flows, if they are vested in the Indians  
15 and shall be free from any control whatsoever, then  
16 the flows, regarding the minimum flows for fisheries  
17 and so on, have to be administered by him. His people  
18 work up there and they handle the gates --

19 MR. SACHSE: Federal people do on Federal  
20 projects.

21 THE SPECIAL MASTER: Oh boy!

22 MR. SACHSE: And have since 1905, without inter-  
23 ruption.

24 THE SPECIAL MASTER: Well, when we get to that,  
25 vogel-cross-white



1 we'll have that discussion, too.

2 MR. WHITE: You think you have a Donnybrook so  
3 far, Your Honor, wait until you see that one.

4 THE SPECIAL MASTER: Go ahead, Mr. White.

5 Q (By Mr. White) I guess what you're saying, Mr. Vogel,  
6 -- I'm sorry, Your Honor.

7 THE SPECIAL MASTER: Go ahead. Go ahead.

8 Q (By Mr. White) Mr. Vogel, is what you're saying, that  
9 ideally you would like to have a continuous flow of  
10 15 cfs during that particular January?

11 A No.

12 Q Or any January?

13 A Not necessarily. I would -- I'm just saying that I  
14 would like it, maybe, to be as close as possible to  
15 15 cfs.

16 Q If you've got 15 cfs 24 hours a day throughout the  
17 entire month, that would be nice, is that right?

18 A Yes, I guess it would be nice.

19 Q Okay. Now, the next question, the next area:  
20 Referring to US Exhibit C-281, what would happen to  
21 habitat in Reach No. 5, if during the April through  
22 November period it had a flow of 325 cfs, rather than  
23 your recommended flow of 500 cfs?

24 THE SPECIAL MASTER: Had a flow of what?

25 vogel-cross-white



1 MR. WHITE: 325 rather than --

2 THE SPECIAL MASTER: 325, instead of 500?

3 MR. WHITE: Yes sir.

4 THE SPECIAL MASTER: All right.

5 MR. WHITE: That's on page 40.

6 A. Which months were you referring to?

7 Q. (By Mr. White) April through November.

8 THE SPECIAL MASTER: April through November?

9 MR. WHITE: Yes sir.

10 A. Which habitat are you referring to; brown trout,

11 rainbow trout?

12 Q. Let's talk about rainbow adult.

13 A. Rainbow adult?

14 Q. Yes sir.

15 A. There would be a reduction in adult rainbow trout,

16 weighted useable area.

17 Q. By roughly 20%, would that be?

18 A. That's pretty close. I figured roughly 17.

19 Q. Okay.

20 THE SPECIAL MASTER: Yeah, but that 17% would

21 be a reduction of -- Well, I guess it is 70% of

22 60,000 square feet, right? Sixty-two or 3,000, down

23 to about -- What was the figure, 300 and how many?

24 MR. WHITE: 325, Your Honor.

25 vogel-cross-white



1 Q (By Mr. White) Are we close enough for discussion?

2 A Sure.

3 Q Isn't it true that the recommended flow on Reach No.  
4 4, which dumps into Reach No. 5, is 325 cfs?

5 A Yes.

6 Q Where's the other 175 cfs going to come from?

7 A That's not really up to me to determine.

8 THE SPECIAL MASTER: Yeah, but if your work  
9 poses a mathematical impossibility, how can we possi-  
10 bly give any compliance to it?

11 THE WITNESS: Well, Your Honor, what I'm trying  
12 to say is, it is possible it could come from several  
13 sources: just hypothetically, it could come from  
14 accretions of flow from the Little Wind River. It  
15 is possible there might be return flows coming in  
16 from Lander upstream, from there, things such as this.

17 THE SPECIAL MASTER: The City of Riverton?

18 THE WITNESS: You know, I didn't -- Anywhere in  
19 that area that returns to stream number five.

20 THE SPECIAL MASTER: The Popo Agie?

21 Q (By Mr. White) But, isn't it true in the Little Wind  
22 River, in the area you have not suggested, the impo-  
23 sition of instream flow and, therefore, there are no  
24 controls over the amount of water which would be injected

25 vogel-cross-white



1 into that system by the Little Wind? The only  
2 assurance that you have is the 325 from Stretch No. 4?  
3 A. I don't understand what you mean by there's no controls.  
4 Q. Let me ask you to assume that there are headgates on  
5 the Little Wind, which divert the water and let me  
6 further ask you to assume that they serve Lander,  
7 which the Master might assign an 1868 priority date to.  
8 How are you going to ensure that water passes those  
9 headgates to make up the 175 cfs deficit?

10 MR. MEMBRINO: Your Honor, I object to the  
11 question. It is not Mr. Vogel's responsibility to  
12 make those assurances.

13 THE SPECIAL MASTER: Well, they might not be,  
14 but if he can throw some light on the burdens -- I'm  
15 going to overrule the objection, Mr. Membrino. He  
16 may answer, if he's able to.

17 THE WITNESS: Okay. All right. I would say,  
18 Your Honor, that those flows could be supplied down  
19 this particular stretch of the Little Wind River to  
20 meet the 500 cfs goal.

21 Q. (By Mr. White) Let me ask you about Reaches 13 and 14.  
22 In Reach No. 14, you have an optimum flow from May  
23 through August of 172 cfs, yet in Reach No. 13, which  
24 dumps into 14, you have a flow of only 77 cfs. In

25 vogel-cross-white



1 In other words, you have well over a 50% reduction  
2 in the amount of inflow that you need to satisfy that  
3 instream flow.

4 MR. MEMBRINO: Your Honor, I must object, again,  
5 to the question, for the same reason and the fact that  
6 Mr. Vogel is only making recommended flows. The fact  
7 that 77 cfs may flow by one point does not mean that  
8 there's not other water in the stream. His figures  
9 for -- His recommended flows are not the water supply  
10 and he's being asked to speculate about --

11 THE SPECIAL MASTER: I appreciate that, and he's  
12 not asked to speculate, or I would sustain you, Mr.  
13 Membrino. But, I believe the questions tend to put  
14 the test of reality onto the product of his work, and  
15 I would like to hear an attempt of this answer, if  
16 he's able to. Now, if he isn't, he says that is just  
17 not a part of my work, fine and dandy. But, I think  
18 he's entitled to a chance to try to tell us how we are  
19 to administer what he recommends, even if it could be  
20 done.

21 THE WITNESS: Quite frankly, Your Honor, that is  
22 correct. It is not part of my assignment to establish  
23 those flows. I would just assume that those flows  
24 would come in from other tributaries, such as the  
25 vogel-cross-white



1 middle fork of the Popo Agie, but I, myself, did not  
2 undertake that portion of the study.

3 THE SPECIAL MASTER: Well, if I were to tell you,  
4 on the middle fork of the Popo Agie, there are  
5 probably 15,000 acres of land of Indians, and a few  
6 non-Indians, that require irrigation and have, for  
7 the last 75 years, does that add an element of value  
8 to your determinations, regarding optimum fish habitat  
9 downstream, as a practical, real matter?

10 THE WITNESS: I didn't address that in my study.

11 THE SPECIAL MASTER: Okay.

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THE SPECIAL MASTER: Okay.

Q (By Mr. White) Mr. Vogel, I direct your attention to another area, and that is the confluence of Reaches 10 and 11 that dump into Reach No. 12. Isn't it true that 10 and 11, when you combine their optimum flow during the month of May, June and July, result in 190 c.f.s. being discharged into Reach No. 12 for which you have an optimum flow of only 75 c.f.s.?

THE SPECIAL MASTER: There we got no problem.

MR. WHITE: Well, let me go on, Your Honor.

THE SPECIAL MASTER: All right.

Q (By Mr. White) Isn't it true that if you increase the flow in Reach No. 12 from 75 c.f.s. to 190 c.f.s., there's absolutely no way to tell the effect on the fish habitat because you blow off the right side of your curve?

A First of all --

THE SPECIAL MASTER: Well, that's very descriptive, you almost sound like an Italian opera. I see your point. Well, answer his question.

THE WITNESS: Well --

THE SPECIAL MASTER: With the dramatics included.

Q (By Mr. White) You can stand up, Dave, it makes it a lot easier; pace back and forth.

THE SPECIAL MASTER: If it has an adverse effect on vogel-cross-white



1 maximum habitat it will have, will it not, if it's that  
2 much more?

3 THE WITNESS: First of all, Your Honor, understand  
4 that my task, my assignment was to approach this, not as  
5 a systems analyst, not to try to make sure this stream  
6 and this stream and those flows match that stream where  
7 they converge, it's simply a reach by reach basis to  
8 maximize the habitat in those particular reaches.

9 THE SPECIAL MASTER: We appreciate that, but your  
10 testimony can be of no benefit to anybody and no realistic  
11 practical value to anybody, and you wouldn't want it to  
12 be that, unless we can integrate it into one unit, the  
13 Reservation and water on that Reservation.

14 MR. MEMBRINO: And I suggest that there will be  
15 witnesses for the United States who will do that. I just --  
16 I think it's inappropriate for us to be asking Mr. Vogel  
17 to speculate about a systems operation --

18 THE SPECIAL MASTER: Well, one or two more objections  
19 and I'll end up sustaining them. I don't think Mr. White --

20 MR. WHITE: Your Honor --

21 MR. MEMBRINO: I'll make them right away if you'd like.

22 THE SPECIAL MASTER: I'm getting a little silly.

23 Shall we take a break for ten minutes?

24 MR. WHITE: I'd like to ask one question, if I might,

25 vogel-cross-white



1 since Mr. Membrino raised the point. I'd like to ask  
2 whether or not the systems analysis, which the United  
3 States will put on, will include the instream flow  
4 recommendation, since the depositions and persons involved,  
5 he indicated that they would not. Is the plan now to  
6 include them?

7 MR. MEMBRINO: That's still in preparation. We're  
8 certainly going to be reconciling and comparing our work.

9 THE SPECIAL MASTER: Let's take a short break,  
10 gentlemen.

11 (Thereupon a ten-minute recess  
12 (was taken.)

13 THE SPECIAL MASTER: Let's come to order. During  
14 several times today we've had discussions, both off the  
15 record and on, regarding settlement, and I think it is  
16 appropriate, regarding settlement, and the possibility of  
17 key dams being built in the higher elevations to capture  
18 spring runoff for the benefit of all concerned, and I  
19 think it's appropriate to state on the record that if the  
20 United States of America, through the office of the  
21 Attorney General -- of the United States Department of  
22 Justice, rather, and the Tribes, through Counsel, and the  
23 State of Wyoming, with approval of the Attorney General,  
24 were to agree that exploratory discussions were in order  
25 regarding appropriations of money of the United States



1 toward the construction of said dams and that the  
2 settlement -- and that monies being appropriated were, or  
3 at least approval of key committees toward those  
4 appropriations would speed a settlement of this lawsuit,  
5 I want all three of you to know that I would be pleased  
6 to make that effort. And I believe it could meet with the  
7 success in this administration. I think this administration  
8 would welcome an opportunity to engage in quasi-public  
9 construction in the West for purposes of settling this  
10 new, difficult question in America of integrating the  
11 reserved water right with long established State rights  
12 of water administration. And I wouldn't even approach  
13 the matter of the private sector taking part in it unless  
14 the three of you felt there would be an area there where  
15 that could be approached. And the difficulty there is  
16 who do you approach in the private sector there. There is  
17 15 or 20 companies that are doing business in the State  
18 of Wyoming, and I approach the three or four I think would  
19 be interested, someone else has their own companies who  
20 they feel are left out, so that would be a difficult field,  
21 that I would not approach that element of it yet.

22 But I would certainly have no hesitancy to go to the  
23 Appropriations Committee and the House and the Senate as  
24 Special Master in this lawsuit with probably one  
25 representative from each of you three to show that this



1 could be one of the best directions for federal  
2 expenditures in America.

3 MR. WHITE: Your Honor, on behalf of the State, I  
4 think the concept is one which we certainly and whole-  
5 heartedly support in concept. The details are difficult  
6 sometimes to deal with. And I would suggest while we are  
7 thinking about this, that perhaps we could quit half an  
8 hour early this afternoon, say around 4:30, and at least  
9 the four of us, three counsel and the Master, sit down  
10 and talk about what the details might be, because I know  
11 that if I went to the Attorney General with the general  
12 concept, he would say that sounds great, but what's  
13 exactly going to be done. And so I would like to ask the  
14 concurrence of the other counsel to have a private meeting  
15 in chambers with the Master during the latter part of  
16 this afternoon to discuss what the details might be,  
17 because I'm confident if I were to go back to the Attorney  
18 General with a reasonably thrashed out discussion, he  
19 would be willing to take some action fairly quickly. He  
20 might suggest that one or two things be changed, but at  
21 least I wouldn't be sent packing for lack of detail.

22 THE SPECIAL MASTER: That will be done.

23 Maybe we're premature to this extent: Do you recall  
24 a month or two ago when I think the United States, either  
25 Tom Echohawk or you might have, Mr. Sachse, said we got



1 some evidence coming up as to where those dams should be  
2 located? Was that Stetson's or was that --

3 MR. WHITE: It wasn't the State, Your Honor.

4 MR. MEMBRINO: HKM had done some preliminary work  
5 for us.

6 THE SPECIAL MASTER: And you intend to offer that  
7 later on, do you?

8 MR. MEMBRINO: I'm not sure we do.

9 MR. WHITE: I don't believe, it wouldn't appear so  
10 from the depositions, Your Honor.

11 THE SPECIAL MASTER: Well, there's evidence that  
12 someone mentioned down the road somewhere, either  
13 Dr. Mesghinna or Stetson --

14 MR. SACHSE: I may have mentioned that one of our  
15 Bureau of Reclamation reports that came out recently  
16 had some mention of possible dam sites in it.

17 MR. WHITE: I think I could tell the Master without  
18 violating any ethical considerations, that I know of a  
19 study which has been done on the Reservation which has  
20 narrowed the potential dam sites to, I believe ten that  
21 have some promise, but I do not know whether that study  
22 has progressed beyond that.

23 THE SPECIAL MASTER: Is it public property, private  
24 property?

25 MR. WHITE: It was financed by the government, Your



1 Honor, but I do not know at what stage it happens to be  
2 right now.

3 THE SPECIAL MASTER: Right.

4 MR. WHITE: And I would suggest that it wouldn't  
5 be necessary for us to necessarily identify the dam sites  
6 before we talked about the details of the kinds of  
7 arrangements that you suggest, because I've been assured  
8 by people whose opinions I respect that there are storage  
9 sites in existence which would be able to deal with the  
10 vast amount of storage required. The money's the problem.  
11 And I would again suggest that at 4:30 we sit down and  
12 put our heads together, and at least try to come up with  
13 something.

14 THE SPECIAL MASTER: Okay. Let's proceed.

15 MR. WHITE: Would that be all right with you?

16 MR. SACHSE: I would welcome that.

17 MR. MEMBRINO: The United States always welcomes an  
18 opportunity to discuss settlement.

19 THE SPECIAL MASTER: All right, proceed.

20 MR. WHITE: Pardon?

21 THE SPECIAL MASTER: Proceed with the case, Mr. White.  
22 And I thank the three of you.

23 Q (By Mr. White) Mr. Vogel, isn't it true that stretch

24 No. 4 or Reach No. 4 is over 40 miles long, 40 river miles?

25 vogel-cross-white



1 A I believe that would be probably true.

2 Q And yet you have the same constant flow for that entire  
3 40 miles; isn't that correct?

4 A Yes.

5 Q And at that particular line, at the east end of that  
6 particular reach, the flow jumps, as it goes across that  
7 line, your recommended flow jumps to 500 c.f.s.; is that  
8 correct?

9 A Yes.

10 Q Wouldn't it be more representative of natural conditions  
11 to have a little more of a gradation between your reaches?  
12 In other words, is it a naturally occurring phenomena  
13 to have a jump like that when you cross a hypothetical  
14 line?

15 A That hypothetical line you're referring to is the  
16 confluence of the Little Wind River.

17 Q Is there something significantly different about the  
18 morphology of this particular river on one side of that  
19 line as opposed to the other side of that line?

20 A I believe, to answer your question, that there was a  
21 significant difference in the stream morphology from  
22 Reach No. 4 as compared to Reach No. 5.

23 Q But just on the other side of that line? In theory a  
24 line is pretty narrow. Was there a significant difference?  
25 vogel-cross-white





1 difference there?

2 A I couldn't answer that, I didn't analyze the exact line.

3 Q Wouldn't it be more representative of natural conditions  
4 to have a gradual increase from reach to reach or a  
5 gradual decrease from reach to reach?

6 A Maybe you can give me an example of what you'd be referring  
7 to.

8 Q Instead of having a constant value for 40 miles of stream,  
9 wouldn't it be more representative of natural conditions  
10 to break that 40 miles of stream into smaller increments  
11 with, if you will, assuming your figures are representative  
12 of the natural condition, starting at 325, at the west  
13 end of the 40-mile segment and through various sub-  
14 segments, gradually increasing until you got to the 500?

15 A It would depend in those natural conditions, though, what  
16 the natural accretions of flow may be.

17 THE SPECIAL MASTER: What the natural accretions  
18 of flow might be?

19 Q (By Mr. White) The accretions and depletions to the  
20 stream, as you go through those 40 miles, are going to  
21 cause significant fluctuations in flow, aren't they?

22 A Well, it depends on the volume of accretions.

23 THE SPECIAL MASTER: Let me interrupt the cross-  
24 examination only to add in the same days transcript, and

25 vogel-cross-white



1 record this, inclusions to our discussions just now made.

2 It is the place of the President of the United  
3 States and Government of Wyoming to settle this matter,  
4 not me. I am the Special Master for the trial of the  
5 matter, but I believe it's appropriate to recognize that  
6 the President of the United States has other functions,  
7 to make the minimum statement of the -- And the Governor  
8 has other duties, and if those two have consent and would  
9 indicate that the role would be appropriate for me to  
10 function with their designees, the Secretary of Interior  
11 and the Attorney General, then I would be happy to do so.  
12 That's the point I want to make sure. I'm not trying to  
13 preempt, to take on anymore work, which is not my role.

14 MR. WHITE: That was one of the details I thought  
15 we ought to work out.

16 THE SPECIAL MASTER: I want to make that clear now,  
17 that I would be, I was volunteering to help, if I may  
18 help to get funds, not that I'm looking for more work to do.

19 All right, back to the reaches, I'm sorry.  
20  
21

22 \* \* \* \* \*



1 Q (By Mr. White) Okay, Mr. Vogel, isn't it true that  
2 throughout that 40-mile stretch there are significant  
3 variations in accretions and depletions to the stream?

4 A I couldn't answer that question.

5 Q You don't know one way or another?

6 A Well, you're asking me, first of all, if they are signifi-  
7 cant and you're asking about both depletions and accre-  
8 tions.

9 Q So you don't know whether or not there are significant  
10 depletions and accretions to that stream reach?

11 THE SPECIAL MASTER: No, 4?

12 MR. WHITE: No, 4, Your Honor.

13 A I'll say I don't believe there are a significant amount  
14 of accretions of flow. In terms of depletions, I couldn't  
15 answer that.

16 Q (By Mr. White) Let me ask you to assume that there are,  
17 and in that event, wouldn't it be more realistic or more  
18 representative --

19 THE SPECIAL MASTER: That there are which, Mr. White,  
20 additions or deductions?

21 MR. WHITE: Depletions. He testified that he didn't  
22 believe that there were significant accretions or inflow,  
23 and I'm asking him to assume that there are depletions  
24 along that stretch of stream.

25 vogel - cross - white



1 Q (By Mr. White) Wouldn't it be more representative of the  
2 natural conditions to break that reach into subreaches or  
3 substretches of that particular claim reach with varying  
4 flows rather than to have a fixed flow for the entire 40  
5 miles?

6 A Well, first of all, I would ask you if you were talking  
7 about whether the depletions were natural or not.

8 Q Okay, let's assume they are.

9 A So you're asking whether they should be incrementally  
10 increased as you go downstream or incrementally decreased?

11 Q Or incrementally fluctuating as to affect the natural  
12 depletions of the stream, the effect of the natural  
13 depletions to the stream.

14 A In my opinion, that particular stretch of stream, it  
15 didn't warrant that.

16 THE SPECIAL MASTER: Certainly, there's no accretions  
17 in that stretch of 4 that would match the flow addition of  
18 the Little Wind joining down near its termination, is  
19 there?

20 THE WITNESS: I don't understand what you're asking.

21 THE SPECIAL MASTER: Well, we were talking about try-  
22 ing to adjust the flows in the stretch of all of 4 so that  
23 they are not so abruptly -- such a disparity between it  
24 and what you asked for in 5. And I was commenting, when

25 vogel - cross - white



1 you say you're not familiar with the accretions in it,  
2 certainly there's no accretion along the whole stretch of  
3 4 that would match the accretion that you get when you  
4 come into the confluence with the Little Wind?

5 THE WITNESS: That's true. Prior to the time where  
6 the river actually meets the confluence of the Little Wind.

7 Q (By Mr. White) Mr. Vogel, would you please turn to Page  
8 24 of your report, Exhibit 280?

9 A. Page 24?

10 Q Yes, sir.

11 A. Okay.

12 Q Could you explain how those curves were drawn?

13 THE SPECIAL MASTER: For which? Under what legend?

14 MR. WHITE: Well, let's call it the adult. We've  
15 been working with the adult.

16 A. The computer drew those.

17 Q Isn't it true that the optimum habitat or the flow for the  
18 optimum habitat which you selected for the particular  
19 reach is 320 c.f.s. which matches the top of the curve  
20 and extends above the upper margin of the graph?

21 A. For adult rainbow trout?

22 Q Yes, sir.

23 A. Yes, the peak of the adult rainbow trout curve was at  
24 approximately 320 c.f.s.

25 vogel - cross - white



1 Q And if my memory serves me correctly, that's the optimum  
2 flow which you -- or the recommended mean monthly flow  
3 which you have on Page 22 for April through October for  
4 that particular reach, is that correct?

5 A Yes.

6 Q Isn't it true that -- Strike that.

7 Did you make any independent determination as to  
8 whether or not the curve should be shaped in such a way  
9 that it peaked at 320 c.f.s.?

10 A I don't understand that question.

11 Q Well, based on the data which you have, isn't it true that  
12 it's just as likely for that curve to peak at, say, 150  
13 c.f.s.?

14 A I still don't follow your line of questioning.

15 Q Well, didn't the computer, as opposed to you, plot the  
16 values which you derived through another computer for  
17 habitat as opposed to discharge or Q?

18 A I'm sorry, Sandy, I still don't understand the point you're  
19 trying to get.

20 Q Mr. Vogel, I hand you what has been marked for identifica-  
21 tion as WRIR, Plaintiff's Exhibit WRIR FISH-103-E, and ask  
22 you to identify that.

23 MR. WHITE: I'm sorry, Your Honor, I didn't make an  
24 extra copy.

25 vogel - cross - white



1 THE SPECIAL MASTER: No problem.

2 MR. MEMBRINO: Sandy, may I have a look at that?

3 MR. WHITE: Sure.

4 Off the record.

5 (Off-the-record discussion.)

6 Q (By Mr. White) Can you identify that?

7 A This is a computer output of flow versus weighted usable  
8 area for the life history stages for brown trout and  
9 rainbow trout in Reach No. 1 on the Wind River Indian  
10 Reservation.

11 THE SPECIAL MASTER: Prepared by whom, can you tell?

12 THE WITNESS: It is an output from the computer, but  
13 it is the result of my work.

14 Q (By Mr. White) Are you able on what's marked in the  
15 upper right-hand corner, Program Habitat, Page 3, to  
16 locate the values of output for Q versus available habitat  
17 areas as percentages of the gross area for rainbow trout?

18 A Please repeat that.

19 Q There is a series of output by month or for Q versus  
20 available habitat area, there is a percentage of the  
21 gross area for rainbow trout.

22 A Okay. It's -- That's discharge and habitat in a listing,  
23 right.

24 Q And then on the previous page there is a chart of Q versus  
25 vogel - cross - white



1 available habitat per 1,000 feet of stream for rainbow  
2 trout?

3 A. Yes.

4 Q. Isn't it true that none of the values of habitat for adult  
5 rainbow trout at any of the discharges shown in that graph  
6 extend as high or are shown on that chart, Exhibit 103-E,  
7 extend as high as the curve on Page 24 of your exhibit?

8 A. Yes, that's true. The computer is simply interpolating  
9 the points to fit a curve.

10 Q. Do you know what assumptions were given to the computer  
11 when it derived that particular curve?

12 A. No. No, I couldn't answer that.

13 Q. Do you know what program, if any, was used in plotting  
14 those curves from the values which were received from the  
15 computer?

16 A. In general, I know it is a plotting routine utilized in  
17 the plotting machine down at the U.S. Bureau of Reclama-  
18 tion computer system in Denver.

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1 Q (By Mr. White) I hand you what's been marked for identifi-  
2 cation as Plaintiff's Exhibit FISH-280/24-E.

3 THE SPECIAL MASTER: Mr. White, are you going to  
4 introduce exhibits tonight or tomorrow, probably?

5 MR. WHITE: Tomorrow.

6 THE SPECIAL MASTER: Okay, thank you.

7 Q (By Mr. White) Isn't it true that the output of the com-  
8 puter, as shown on the second page of Exhibit 103, FISH-  
9 103-E, that the table entitled, "Q versus the Available  
10 Habitat of the Stream", I guess it's the third page, for  
11 rainbow trout, are shown by the Xs which have been placed  
12 on the curve in Exhibit FISH-280/24-E?

13 A Yes, they'd be approximately correct.

14 Q How do you know that the peak of that curve does not  
15 occur to the left rather than to the right of the second  
16 X along that curve?

17 A Please repeat that.

18 Q I'm going to circle in red the second X along that curve.

19 THE SPECIAL MASTER: Is that the X across from 50 or  
20 is that the X across from 4 -- which is it -- I'm sorry.

21 All right, counting the one from the bottom, I see.

22 THE WITNESS: Are you going to repeat the question?

23 Q (By Mr. White) How do you know that the peak of that  
24 curve should not occur to the left of the second X, which

25 vogel - cross - white



1 I've circled in red, rather than to the right of  
2 that second X?

3 A. I believe I would just have to answer that by saying  
4 the likelihood is that it would appear to the right.  
5 It's a very common practice in my particular field  
6 to interpolate points on a curve. In fact, I'll be  
7 doing that at the present time, when I work in Calif-  
8 ornia, working with salmon, figuring out spawn recruit  
9 curves. We simply take a tremendous amount of the  
10 data that we've actually collected in the field, plot  
11 them on a graph, draw a curve to fit those.

12 We may not necessarily be fitting them to exactly  
13 the point we have there, but we're fitting them to  
14 a curve that we're interpolating between those points.

15 I might point out, also, that in the reach  
16 you're referring to, we're also using brown trout,  
17 whose curve also peaks at approximately 320 cfs on  
18 page 23. So we are not just limiting it to only  
19 rainbow trout.

20 Q Let me ask you about that curve on page 23. What  
21 conventions if you know, did the computer, computer  
22 plotting program use to have a peak in the brown trout  
23 curve for adults in that area?

24 A. Again, it's the same thing, it's just simply  
25 vogel-cross-white



1 interpolation of the two points, fitting the curve  
 2 to the data points.

3 Q Are you saying then that how you fit the curve to the  
 4 data points is a matter of professional judgment, or  
 5 interpretation, which may vary between fisheries  
 6 biologists?

7 A No. Again, I didn't fit the curve, the computer fitted  
 8 the curve.

9 Q Are you able to describe for us, so that we might find  
 10 the computer program which you used to fit the curve  
 11 to the data point?

12 A Again, that is going back to what we talked about this  
 13 morning. It's -- It's accessible in the same way that  
 14 the prior programs you're referring to.

15 Q What command did you -- Did you do your work through  
 16 the Bureau of Reclamation in Denver again, as well as  
 17 for the other work you've done?

18 A Yes.

19 Q Do you know what command you used to call up that  
 20 program, which plotted the curve to the data points?

(Brief pause.)

22 A I believe the computer command was Call (Rhap) --  
 23 excuse me (Rhabplt) (I equals the name of the permanent  
 24 file I used, J equals Media).

25 vogel-cross-white



1 Q Are you referring to some notes which we've already  
2 informally marked?

3 A Yes.

4 Q And what is that exhibit number?

5 A You have it pencilled in the right-hand corner F-I-S-  
6 H hyphen 31.

7 MR. WHITE: I'd like to inquire of the United  
8 States whether it would be possible for us to, our  
9 experts to visit the Bureau of Reclamation in Denver,  
10 at our expense, call up the program listing for the  
11 plotting program as well as the programs which Mr.  
12 Vogel used, as part of his earlier analysis?

13 MR. MEMBRINO: Your Honor, I think we have no  
14 objection, with the understanding, one, that the State  
15 is going to do it at its expense, and two, that we  
16 check with the Bureau of Reclamation just so we know  
17 the procedures the State are required to go through,  
18 and as long as they're willing to comply with that,  
19 that's fine.

20 THE SPECIAL MASTER: That's what Mr. White wanted  
21 to know.

22 MR. WHITE: I'm advised that it may be possible  
23 to go through the instream flow group, since our  
24 expert's located in Fort Collins, I would appreciate

25 vogel-cross-white



1 it if we could see if that's possible.

2 MR. MEMBRINO: Sure.

3 THE SPECIAL MASTER: All right.

4 MR. MEMBRINO: When would you like to do that?

5 MR. WHITE: Next week would be a good time, our  
6 guys are going to be off.

7 THE WITNESS: Excuse me, Sandy, have you copied  
8 this exhibit yet?

9 MR. WHITE: No, I haven't. I've been waiting  
10 for a chance for you to accompany the people to the  
11 xerox machine. When we recess at 4:30, it might be  
12 a good time for you to go with someone.

13 THE SPECIAL MASTER: Were there not two in that  
14 group, that and the papers that accompanied it?

15 MR. WHITE: Yes, sir. I wanted to be sure you're  
16 along so you could block out the information which  
17 might cause your counsel some cause.

18 Q (By Mr. White) Okay. Since it's late in the after-  
19 noon, let's turn to another area which concerns the  
20 facts and data upon which you relied. I'm going to  
21 be handing you a series of exhibits which were ex-  
22 hibits from your deposition. I'm going to be discuss-  
23 ing with you whether or not -- whether you can  
24 identify those, or ask you to identify them and ask

25 vogel-cross-white



1 you whether or not you relied on the information  
2 contained in there, or if that indicates the analysis  
3 which you went through. And in order to save time,  
4 rather than asking each question, as I hand you the  
5 exhibit and indicate the number, could you indicate  
6 what the exhibit is and if you relied on it, or if  
7 it demonstrates your analysis.

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1 THE WITNESS: Excuse me, Your Honor, could we go off  
2 the record for a minute?

3 THE SPECIAL MASTER: Yes, indeed, off the record.

4 (Off-the-record discussion.

5 THE SPECIAL MASTER: On the record.

6 I think the record should show that during the break  
7 the witness has before him a stack of exhibits 8 inches  
8 high or so and will, according to counsel, will look over  
9 that this evening as to those exhibits that he -- and the  
10 facts and data on which he relied and will have that for  
11 you tomorrow morning.

12 MR. WHITE: Yes, sir.

13 THE SPECIAL MASTER: Why don't we adjourn now into a  
14 little conference with one counsel from each of you and  
15 let's see if we can't talk a little more along the settle-  
16 ment thing.

17 (Proceedings recessed, 4:15 p.m.

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7 First Judicial District, State of Wyoming, hereby certify  
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9 that we did at the time, date and place, as set forth, re-  
10 port the proceedings had before the Honorable Teno Roncalio,  
11 Special Master Presiding, in stenotype; that the foregoing  
12 pages, numbered 6697-6844, inclusive, constitute a true,  
13 correct and complete transcript of our stenographic notes as  
14 reduced to typewritten form under our direction.

15 We further certify that we are not agents, attorneys  
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17 in the outcome thereof.

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