

IN THE SUPREME COURT OF THE UNITED STATES

Volume 2 of 25

Part 1 of 2

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STATE OF MONTANA

Plaintiff.

v.

STATE OF WYOMING

and

STATE OF NORTH DAKOTA

Defendants.

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BEFORE THE HONORABLE BARTON H. THOMPSON, JR.  
Special Master  
Stanford, California

James F. Battin United States Courthouse  
2601 2nd Avenue North  
Billings, Montana 59101  
October 17, 2013

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## P R O C E E D I N G S

1  
2 SPECIAL MASTER: Good morning everybody.  
3 Good morning, Mr. Book.

4 Before we continue the examination of  
5 Mr. Book, I wanted to just deal with one or two  
6 administrative matters. So next week is going to  
7 be our week in the wilderness, as we sort of  
8 wander from location to location. So the first  
9 thing that's going to happen is that on Monday we  
10 are going to have to move from this courtroom to  
11 the Powder River courtroom. So Monday and  
12 Tuesday we'll be over there. Moving all of the  
13 boxes from this courtroom over to the Powder  
14 River courtroom.

15 Then it looks like there will be  
16 hearings by the district court in all various  
17 courtrooms in this building on Wednesday  
18 afternoon and Thursday. I can't imagine that we  
19 would move from here to the Oil and Gas  
20 Commission hearing room over the lunch hour. So  
21 what I propose is on Wednesday and Thursday that  
22 we hold our hearings for those two days over in  
23 the Oil and Gas Commission hearing room. Then we  
24 get to move back here, and I believe we will at  
25 that point be back in this particular courtroom,

1 and, hopefully, once we are back in this  
2 courtroom, we will be able to stay in this  
3 particular courtroom. It's looking pretty clear.  
4 I probably shouldn't say that, I'll jinx it, but  
5 I think it's looking pretty clear until maybe  
6 that week of November 18th. That's the one that  
7 we are just not quite sure about. Again, I will  
8 keep you all informed as much as I can about  
9 where we are going to be, but we are visitors in  
10 this particular courthouse, and it turns out that  
11 there are some judges that prefer one courtroom  
12 over another courtroom.

13           So going back to all those boxes that I  
14 see people looking around, how are we going to  
15 move this. What I would suggest, and we'll see  
16 how we are doing, but that we might stop early  
17 today, like, about 4 o'clock today rather than  
18 4:30, and actually use that time to move over  
19 into that courtroom, and we are going to try and  
20 get some carts that we might be able to use to  
21 help move those.

22           Mr. Kaste, you rose.

23           MR. KASTE: Is the courthouse open  
24 tomorrow? I know we are not going to have  
25 proceedings tomorrow, but our team will be here.

1 We could use our time tomorrow to move these and  
2 we can do it at our leisure, if it's okay with  
3 courthouse personnel.

4 SPECIAL MASTER: So let me do several  
5 things. So, first of all, let me just ask Mr.  
6 Draper, are you going to have people around  
7 tomorrow?

8 MR. DRAPER: Yes, we are going to be in  
9 town tomorrow.

10 SPECIAL MASTER: Okay. So one of the  
11 problems is that my principal courtroom deputy is  
12 taking off on a trip tomorrow, and you have to be  
13 at the airport at 10, right?

14 DEPUTY CLERK: I'm not leaving until  
15 10. I could meet you here at 7:30 or whenever,  
16 if -- I can get you in the side door by the  
17 loading dock and get you up the staircase rather  
18 than using the front door. I'll get permission  
19 to do that from the clerk's office. I wouldn't  
20 think it would be a problem. I don't know about  
21 which judges are going to be here tomorrow.

22 SPECIAL MASTER: I don't think there is  
23 any judge. I think it's Monday and Tuesday, if I  
24 remember from talking to the chief clerk here, we  
25 just need to be there by Monday morning.



1 MR. KASTE: Could you just ask the clerk  
2 --

3 DEPUTY CLERK: No, I've been told I  
4 can't ask the clerk tomorrow for any help. I  
5 have to be here when you're in the courtroom to  
6 open it and lock it and unlock it. But I'll do  
7 whatever I can to help you. If you can be here  
8 early, I'd be happy to do that.

9 MR. KASTE: We certainly can.

10 DEPUTY CLERK: I'll get permission to  
11 allow you to come in that side door with me.  
12 I'll have an answer for you as soon as I can.

13 MR. KASTE: Mr. Brown asked if we are  
14 required to move everything out of this courtroom  
15 or just what we may need.

16 DEPUTY CLERK: That's a good question.  
17 Why couldn't they leave their boxes here, but  
18 I'll ask Nancy.

19 SPECIAL MASTER: We can check on that  
20 over the hour. I think the major concern, if I  
21 remember correctly, on Monday and Tuesday, one of  
22 the reasons why we need to be out of here is that  
23 there are hearings in this courtroom, and I think  
24 Nancy, in particular, was concerned that given  
25 the numbers of attorneys going in and out, that

1 you wouldn't want to come back in and find that  
2 somebody has actually taken something. Now, I'm  
3 not sure they would want to take one of your  
4 boxes. So what we will do, we will check on  
5 this, and we'll figure out. We'll make it work  
6 one way or the other.

7 MR. DRAPER: Your Honor, I've been  
8 reminded, I have a conference call tomorrow  
9 morning at that time that involves several of us  
10 with the special master in No. 137. We just as  
11 soon do it this afternoon if we could and get  
12 whatever changes need to be made done this  
13 afternoon.

14 Also, another thing that has occurred  
15 to us, next week if we are out, what, Wednesday  
16 and Thursday, it may make sense to just do Friday  
17 over there as well rather than changing between  
18 two contiguous days where we would have more time  
19 with a weekend in between to make the change back  
20 here. But I think your original idea about  
21 getting it done today, I don't know how long it  
22 would take, but I wouldn't want to run into a  
23 problem with the flight schedule. So anyway our  
24 recommendation is to do it this afternoon as you  
25 suggested.

1 MR. KASTE: And my preference would be  
2 that we press on with the testimony.

3 SPECIAL MASTER: Right. What I will do  
4 is suggest that we longer discuss this at this  
5 particular point in time because we are using up  
6 testimony time, and that we spend a little bit of  
7 time during the first break talking about this  
8 issue. What I would probably be most interested  
9 in at that point is what the estimated time would  
10 be for actually having to move things from one  
11 courtroom to the other. And then that will give  
12 my deputy time to actually be able to talk to the  
13 clerk and see what the various options might be.

14 Also, Mr. Draper, I thought about your  
15 idea that, yes, does it make sense to move back  
16 to this courtroom just for Friday. At the end  
17 I'm not sure it makes a huge difference, only  
18 because it's not going to be open over the  
19 weekend, so you can't move over the weekend  
20 anyway. But we can play that by ear next week as  
21 to whether or not we actually move back here. I  
22 just think given that this is set up as a  
23 courtroom and has worked quite well now that we  
24 have figured out most of the equipment, that it  
25 probably makes more sense to move back here.

1 But, again, we don't need to make that particular  
2 decision at this point. I agree, it seems a  
3 little bit odd just to move back for that one  
4 day. But if we have to move back anyway, we  
5 might as well do it.

6 MR. DRAPER: I might also mention, it  
7 would make it easier on us, for instance, if we  
8 could have access over the noon hour. Now, this  
9 doesn't work if there's a hard and fast rule that  
10 people can't be in here unless some  
11 representative of the court is babysitting them,  
12 but it doesn't seem to me to be that necessary in  
13 terms we are in a very well secured building.  
14 The access to the courtroom would be nice since  
15 we don't have too much flexibility before and  
16 after court, if people need to pull exhibits, get  
17 things ready to expedite proceedings while we are  
18 in session it would be helpful.

19 DEPUTY CLERK: I'll be available.

20 SPECIAL MASTER: Susan can be on the  
21 floor. The clerk's office here has its rules,  
22 I'm sure they have excellent reasons for those  
23 rules, and my power has limitations, as you all  
24 know. So there are some rules that we can't  
25 overcome, but we can adjust around them as best

1 we can.

2           Okay. Mr. Book, you are still under  
3 oath.

4           THE WITNESS: Yes, sir.

5           SPECIAL MASTER: And so, Mr. Draper, I  
6 will turn it back to you for continuation of your  
7 direct examination.

8           MR. DRAPER: Thank you, Your Honor.

9           DIRECT EXAMINATION (Cont'd)

10          Q        (By Mr. Draper:) Good morning to you,  
11 and good morning to, Mr. Book.

12          A        Good morning.

13          Q        Mr. Book, let's pick up where we were  
14 as we concluded yesterday discussing in your  
15 rebuttal report Exhibit M-6 at pages 14 to 16  
16 your analysis of Montana pre-1950 water rights.  
17 You had referred us as part of that to Appendix  
18 D, which starts on page 120 of your rebuttal  
19 report, entitled, Montana Pre-1950 Water Rights  
20 Data. We had looked at the Nance Cattle Company  
21 entry, which is the first one. I'd just like to  
22 ask you to look at the second one as a final  
23 example a water right we might recognize, what  
24 appears on page 139.

25          A        I did not bring that exhibit up with me

1 to the bench.

2 (Pause.)

3 Thank you.

4 Page 139 is the water right, the  
5 beginning of the water right maps and documents  
6 for the T&Y Canal.

7 Q And, again, this shows a water right  
8 claim, does it not, on page 141?

9 A Yes, it does.

10 Q With what priority?

11 A The priority on this water right is  
12 August 9, 1886.

13 Q And the flow rate?

14 A 187.5 cfs.

15 Q Thank you very much. Turning back to  
16 the text of your report, without going through  
17 the other 75 water rights represented in Appendix  
18 D, would you describe how you used that  
19 information and examine the criticisms that had  
20 been made by the Wyoming expert and what your  
21 conclusions were on that.

22 A Yes. The conclusions are expressed in  
23 the tabulation that I prepared in Tables 4-A and  
24 4-B, which is the compilation of the water rights  
25 information for each of these 77 water rights,

1 including the acreages that were claimed,  
2 examined, and ultimately the final acreages for  
3 each of these water rights. This information  
4 then was used to prepare the maps that are also  
5 enclosed with this report of the irrigated area.  
6 This is in Appendix A.

7           What I did with the information from  
8 the tabulation and the maps in the file was to go  
9 to irrigated area mapping and identify the lands  
10 that are associated with the pre-1950 water  
11 rights. And those are identified in gold on  
12 Exhibit -- Appendix A, excuse me.

13           Q       And what conclusions did you draw as a  
14 result of that analysis?

15           A       That the actual pre-1950 irrigated  
16 acreage in Montana for the year 2009 is 8300  
17 acres. On page 16 of the text in the report I  
18 summarize the irrigated area. Based on three  
19 different years of aerial photography, the  
20 irrigated ranged from 8,300 for 2009 photography,  
21 to 9,500 acres for 2011 photography. Again, this  
22 is the area upstream of the T&Y Canal.

23           Q       And did you compare those acreages to  
24 the water right acreages?

25           A       Yes, I did. The pre-1950 water right

1 acreage that I tabulated is shown on the bottom  
2 of Table 4-A and that is 11,576 acres.

3 Q And did you make a comparison between  
4 the water right acres and the irrigated acres?

5 A Yes, I did, as indicated on page 16,  
6 the actual acreage irrigated ranges from 72  
7 percent to 82 percent of the water right acreage.

8 Q And did you comment on that as far as  
9 how that compared between the two states?

10 A Yes, I did. On page 16 I note for  
11 comparison that the irrigated area within the  
12 Tongue Basin in Wyoming can be compared to the  
13 adjudicated water rights for direct irrigation,  
14 and based on some information about the total  
15 water rights in the basin in the 1977 report that  
16 I reference there, the ratio of actual irrigation  
17 to water rights was about 60 percent in Wyoming.  
18 That's for a comparison of irrigated area to  
19 water right acreage.

20 Q And you refer in that regard to the  
21 1977 CH2M report?

22 A Yes.

23 Q And that is Exhibit M-36 in this  
24 proceeding. Did you rely on that report for the  
25 purpose that you just stated?



1           A           Yes, I did.

2           Q           Did you find that report reliable for  
3 the purpose that you used it?

4           A           Yes.

5           Q           What were your overall conclusions with  
6 respect to the Montana pre-1950 water rights  
7 issues in response to the Wyoming expert?

8           A           That the pre-1950 irrigated acreage in  
9 Montana, as documented by the existing status of  
10 the water rights, is comparable to the amount of  
11 acreage that I had identified from the water  
12 resource surveys as pre-1950 level irrigated  
13 area.

14          Q           In your original report?

15          A           Yes.

16          Q           Let me turn your attention, if I may,  
17 to the analysis you made of direct flow demands  
18 in response to the expert, Mr. Hinckley, from  
19 Wyoming. What analysis did you perform there?

20          A           One of the issues that was raised by  
21 Mr. Hinckley in his comments on my report was  
22 that the return flow timing was too slow and I  
23 had understated the return flows available for  
24 diversion during the irrigation season.

25                       In response to that I evaluated my

1 analysis of the return flows, including the  
2 methodology and the parameters that I had used.  
3 The return flow timing is a function of the  
4 irrigation location and irrigation methods to  
5 determine the amount of return flow and how that  
6 return flow accrues back to the stream.

7 Q And, again, when we are talking about  
8 return flows returning to the stream, those are  
9 what would be called accretions to the stream?

10 A Yes.

11 Q So those are discharges from ground  
12 water that add to the flow in the stream?

13 A Yes.

14 Q And how did you go about analyzing the  
15 criticism of Mr. Hinckley?

16 A In reviewing the methodologies used for  
17 irrigation along the Tongue River, I concluded  
18 that approximately one-half of the irrigation  
19 occurs by sprinkler, which has essentially no  
20 surface water return to the stream. The issue  
21 here, as I interpreted it, was that Mr. Hinckley  
22 considered the lagging that I made to be too  
23 extended and delayed because I had not included a  
24 surface return flow component to the stream. My  
25 original opinion, and my opinion continues to be,

1 that the surface returns from the irrigation  
2 along the Tongue River are rather insignificant  
3 because of the border irrigation methodologies  
4 that are used for the gravity irrigation and  
5 because of the large amount of sprinkler  
6 irrigation that occurs.

7 In response to the criticisms, to see  
8 how the timing of the return flow would affect  
9 the calculations, I made a sensitivity run where  
10 I modified the response function and compared the  
11 results with a modified response function to  
12 those I had originally derived.

13 Q In analyzing the return flows, did you  
14 utilize the IDS AWAS alluvial accounting system  
15 by Mr. Schroeder of Colorado that we are familiar  
16 with for simplified ground water returns to a  
17 river?

18 A Yes, that was the software that I used.

19 Q And that, for the record, is identified  
20 as Exhibit M-25. Is that reliable software and  
21 software documentation for the purpose you used  
22 it?

23 A Yes.

24 Q And you did rely on it?

25 A Yes.

1           Q           How did you use it in this instance to  
2 analyze the claims of Mr. Hinckley?

3           A           As I did in my original analysis. I  
4 didn't need to reapply that for this purpose  
5 here. I modified my response function to  
6 include a surface runoff component on part of the  
7 ground that was irrigated. In this case about 50  
8 percent. And with the revised response function,  
9 I recalculated the demands and compared them to  
10 the demands I had originally derived.

11          Q           And did that allow you to make any  
12 conclusions with respect to the validity of Mr.  
13 Hinckley's criticism?

14          A           My conclusion with respect to the  
15 validity is based on my understanding of the  
16 irrigation system and the geologic setting along  
17 the Tongue River to conclude that there is  
18 minimal surface water returns to the stream.  
19 What the comparison allowed me to do was to  
20 conclude that there was little effect on my  
21 ultimate answer concerning the frequency when the  
22 direct flow demand exceeded the stream flow under  
23 either version of a response function.

24          Q           And did you show the details of that  
25 analysis in tables in your report?

1           A           The results of the analysis are  
2 summarized in a set of tables from page 32  
3 through 36, Tables 5-A, B, and 6-A, B, and C.

4           Q           Would you briefly describe what is  
5 shown in those tables, please?

6           A           Yes, Table 5-A is a repeat of the table  
7 out of my January report, which shows in shading  
8 those months when the stateline flow was less  
9 than the calculated demand on a mean monthly  
10 basis.

11                   Table 5-B then is a companion table  
12 which shows the same comparison of demand with  
13 stateline flow under sensitivity analysis. And  
14 at the bottom of each -- of those two tables is a  
15 tabulation of the number of years when the demand  
16 exceeded the stateline flow in each of those  
17 months. Moving on to table 6-A, 6-A is a  
18 tabulation for each of the months May through  
19 September of the number of days each month when  
20 the stateline flow was less than the calculated  
21 demand. Table 6-A is a comparison for the  
22 January report and Table 6-B is a comparison for  
23 the sensitivity analysis. And then there's an  
24 additional Table 6-C on page 36 which shows the  
25 difference in the number of days each month

1 between the results of the two.

2 Q And what are those results?

3 A When you look at Table 6-C, you can see  
4 that the differences in the number of days is  
5 very minimal when you compare the two -- the  
6 results of the analysis with the two different  
7 response functions. I've expressed the average  
8 number of days for the total period May through  
9 September on Table 6-C, and the difference was  
10 two days out of that period when you compared the  
11 average for the two.

12 Q Is it correct to say that you have done  
13 two types of sensitivity analysis, one on a  
14 monthly basis and one on a daily basis to  
15 determine whether Mr. Hinckley's criticism was  
16 correct?

17 A Yes.

18 Q And what did the first of those  
19 analyses yield in terms of comparison of the  
20 original way you did it and the way you did it  
21 changed to reflect...

22 A The critical months, of course, as I  
23 mentioned yesterday are July, August, and  
24 September. So if you compare the number of years  
25 for those three months on table 5-A and 5-B, you

1 can see that the July and August totals are  
2 different by one year, and the September total is  
3 different by three years. That changed the  
4 number of years when the stateline flow was less  
5 than demand from 39 to 36 for September.

6 Q And looking at the August column,  
7 instead of the stateline flows going below the  
8 stateline demand in 43 years, with the changes  
9 generated to test Mr. Hinckley's criticism that  
10 number of 43 was reduced to 42 years in which  
11 flows at the stateline went below what was needed  
12 there to satisfy pre-1950 rights?

13 A Yes.

14 Q In essence the daily analysis shown on  
15 your succeeding three graphs showed the same  
16 results, but with a daily time set?

17 A Yes, that's correct.

18 Q And your overall conclusion then, based  
19 on that sensitivity analysis, was what?

20 A That my original conclusion regarding  
21 the frequency and timing when the direct flow  
22 demands exceed the stateline flow remain intact.

23 Q Now looking at pages 17 through 19 of  
24 your report, in the section entitled, return flow  
25 analysis, what criticism of Mr. Hinckley did you

1 analyze in this section?

2 A This is a description of the analysis  
3 that we just discussed as it relates to the  
4 irrigation methodologies that occur along the  
5 river and the sensitivity analysis that I made.  
6 And on the bottom of page 18 the actual demands  
7 are compared.

8 Q And would you describe specifically  
9 what's shown there?

10 A On page 18, the bottom of the page,  
11 shows the monthly demand calculations for the  
12 months of May through September, as I derive them  
13 in the January report, and next to that are the  
14 demand calculations determined with the  
15 sensitivity analysis.

16 Q And these show marginal differences, is  
17 that your conclusion?

18 A Yes. The maximum difference here is  
19 about 20 cfs for the month of June, which is not  
20 a significant month in this analysis. So July is  
21 a more significant month, and the difference  
22 there was 15 cfs.

23 Q And separate from the sensitivity  
24 analysis you did, which accepts his criticism, do  
25 you believe as a matter of engineering analysis



1 that it was an appropriate change to make to your  
2 analysis?

3 A The analysis that Mr. Hinckley did was  
4 what I would characterize as a test run to  
5 quantify what the demands would have been if  
6 there was no lag return flow and simply assumed  
7 that the amount of diversion that was not  
8 consumed was returned to the stream in the  
9 current month. I consider that to be not a valid  
10 analysis of the return flows.

11 Q And, briefly, the reason that you  
12 consider it not to be a valid analysis of return  
13 flows?

14 A Because return flows from irrigation  
15 application will be lagged back to the stream  
16 over some delayed time and would not be  
17 instantaneous.

18 Q Just to be sure we are clear on that,  
19 do you consider your original direct flow demands  
20 as calculated and shown in your January report to  
21 be reasonable?

22 A Yes.

23 Q Looking at the last section of your  
24 report, page 20, entitled, Tongue River  
25 Reservoir, what analysis did you perform in

1 response to what criticism in this section?

2       A       One of the issues that Mr. Hinckley had  
3 identified was what I refer to as the winter  
4 bypass at the Tongue River Reservoir, and the  
5 issue was specifically related to the four years  
6 that I have been evaluating, 2001, 2002, 2004,  
7 and 2006, as to whether a change to the  
8 wintertime storage operations would have resulted  
9 in more water being stored in the reservoir  
10 before the irrigation season in each of those  
11 four years.

12               I did two things in this regard. I  
13 reviewed Mr. Hinckley's analysis that he provided  
14 to us, and evaluated the impact of his  
15 calculations as it relates to the wintertime  
16 operational constraint at the reservoir to  
17 essentially limit the storage to about 45,000  
18 acre-feet during the winter season, which I  
19 considered to be the period through the end of  
20 March. This is a constraint that's identified in  
21 the operations manual for the reservoir. The  
22 analysis that Mr. Hinckley provided with his  
23 report was to store all flow in excess of either  
24 50 cfs or in excess of 75 cfs bypassing the  
25 reservoir to evaluate how much additional water

1 could have been stored in the reservoir. As a  
2 result of his calculations he was simulating or  
3 estimating storage during the wintertime that was  
4 significantly exceeding the 45,000 acre-foot  
5 constraint.

6 Q Did you illustrate your analysis in  
7 that regard in figures 9-A and 9-B?

8 A Yes, I did.

9 Q Pages 47 and 48?

10 A Yes.

11 Q What does figure 9-A show?

12 A Figure 9-A is a graph. The format of  
13 this graph is basically extracted from Mr.  
14 Hinckley's report showing the reservoir operation  
15 from 1991 through 2009 and comparing the  
16 historical operation of the reservoir with the  
17 simulation that he made of storing all flow in  
18 excess of 50 cfs. What I have added to the graph  
19 were the series of red dashes, which are placed  
20 on this graph at 45,000 acre-feet during the  
21 winter months, which, as I mentioned, extends  
22 through the end of March.

23 This graph shows for the analysis that  
24 was provided to us that the simulated results,  
25 which are the black lines, exceeded the 45,000

1 acre-foot at the end of March and during the  
2 winter season virtually throughout the study  
3 period.

4 Q And what is the significance of the  
5 storage exceeding the 45,000 mark on this graph?

6 A Well, that is an operational constraint  
7 on the reservoir that affects the timing of the  
8 filling and the amount of fill and bypass that  
9 occurs during the winter season at Tongue River  
10 Reservoir. Mr. Hinckley, in making his analysis  
11 and deriving his conclusions, was not limiting  
12 storage during the season to that amount.

13 Q Is that a deficiency in his analysis?

14 A Yes. I believe it does not recognize  
15 the established practice of the reservoir and  
16 spelled out in the operation manual.

17 Q And did you do a similar analysis with  
18 respect to releases at the 75 cfs level in Figure  
19 9-B?

20 A Yes, I did. The same graph is shown in  
21 9-B, except that the dark line here was generated  
22 using a bypass, or using storage of all flow  
23 above 75 cfs in the reservoir.

24 Q And what does this graph Figure 9-B  
25 show then?

1           A           This effectively shows the same thing  
2 as the previous graph, that Mr. Hinckley  
3 simulated results for that analysis, routinely  
4 assumed that there would be storage during the  
5 winter in excess of 45,000 acre-feet.

6           Q           And in his analysis does the reservoir  
7 fill in every year?

8           A           No, it does not, as indicated by the  
9 dark line, the blue line, for two years, 2001 and  
10 2004. Even with the assumptions made by Mr.  
11 Hinckley, the reservoir did not fill, would not  
12 have filled in those two years.

13          Q           Did you prepare a table, Table 7, in  
14 conjunction your analysis?

15          A           Yes, I did. On page 37 is a short  
16 summary table that helps interpret these graphs.  
17 This shows for each of the four years of interest  
18 the March 31 end-of-month contents under each of  
19 the two scenarios that were presented by Mr.  
20 Hinckley, and compares that to the historical end  
21 of March content for each of those four years.

22          Q           And what is the significance of this  
23 tabulation?

24          A           This tabulation, again, is a summary of  
25 what's displayed graphically in the figures, but

1 this shows the amount of storage in each of the  
2 two simulations. If you look at the 75 cfs  
3 scenario, the simulated storage at the end of  
4 March ranged from 56,000 in 2002 to 76,000 in  
5 2006. I've also compared the historical  
6 operation here, and the range historically was  
7 27,000 to 49,000 for the contents at the end of  
8 March.

9 Q And why did you choose the end of March?

10 A That's my interpretation of the  
11 approximate winter season as expressed in the  
12 manual.

13 Q So the overall conclusions that you  
14 would draw with respect to Mr. Hinckley's  
15 criticisms based on the 50 cfs and 75 cfs release  
16 levels is what?

17 A I evaluated the records separately from  
18 Mr. Hinckley's analysis, and concluded on my own  
19 if the 45,000 acre foot limit is adhered to  
20 during the winter months, that the reservoir  
21 would not have filled in each of the four years  
22 even if flows in excess of 75 cfs had been  
23 stored. So that's my primary conclusion from  
24 this is that the available storage capacity in  
25 the reservoir is constrained during the

1 wintertime, and for each of these four years the  
2 reservoir would not have filled when that  
3 constraint is taken into consideration.

4 Q When we were looking at Figure 9-A, I  
5 noticed that I skipped over Figure 8, which  
6 relates to your direct flow analysis. Can you  
7 say a word about that? I apologize.

8 A It's on page 46. This is a graphical  
9 comparison of the return flow patterns during the  
10 months of the irrigation season. In dark blue is  
11 the original response functions that I derived  
12 from my analysis, and the light blue are as a  
13 result of the response functions in the  
14 sensitivity analysis. What this graph is  
15 expressing is the percentage of diversion that is  
16 return flow in each of these months after you  
17 consider the lagging and the composite effect  
18 back to the stream during the irrigation on a  
19 month-by-month basis.

20 What this shows, as you move through  
21 the season the amount of return flow in the  
22 stream, in this case normalized to diversion, it  
23 increases, which is what you would expect. What  
24 this shows is the effect of the sensitivity  
25 analysis on those percentages as you move through

1 the season. In my opinion these differences are  
2 not significant and help explain why the results  
3 are very comparable from the two analyses.

4 The reason for this is because as the  
5 response functions are lagged out slower, you  
6 tend to get the lagging stretched out over a  
7 longer duration and you have more return flows  
8 coming back in following seasons. So there's  
9 some offsetting effects.

10 Q This graph shows different levels of  
11 accretions to the stream in the form of return  
12 flows?

13 A Yes.

14 Q Under the two different analyses?

15 A Yes.

16 Q And in your analysis in this rebuttal  
17 report you have relied on stateline stream flows,  
18 and are those contained in your Appendix B?

19 A Yes, they are.

20 Q Mr. Book, would you summarize, if you  
21 please, the opinions that you have drawn as  
22 adjusted through your rebuttal report based on  
23 the engineering analysis that you have performed  
24 and testified to here?

25 A The analyses are summarized with



1 respect to the Montana pre-1950 uses and the post  
2 1950 impacts that I analyzed within Wyoming.  
3 With respect to the pre-1950 uses in Montana, the  
4 conclusions with respect to Tongue River  
5 Reservoir are that the reservoir did not fill in  
6 four years since the enlargement was completed  
7 and the improvements made at the reservoir.  
8 Those were four significantly dry years on the  
9 Tongue River in the Tongue River Basin. Those  
10 are years when additional water, if it had not  
11 been used by post 1950 uses in Wyoming, would  
12 have accrued to the reservoir to assist but not  
13 totally fill the reservoir. The impacts are part  
14 of the shortage that was experienced at the  
15 reservoir.

16           The Tongue River Reservoir is used to  
17 irrigate both pre and post 1950 acreage. I  
18 quantified the total acreage between the  
19 reservoir -- actually, between the stateline and  
20 T&Y Canal at approximately 14,900 acres. In  
21 addition, the T&Y Canal is used to irrigate  
22 slightly less than 10,000 acres, using water from  
23 the Tongue River.

24           Of that, the pre-1950 acreage I derived  
25 the actual acreage for three years, and that

1 ranges from approximately 8,000 to 9,000 acres  
2 under current conditions.

3           The water rights along the Tongue River  
4 in Montana are served -- water rights are direct  
5 flow water rights, and then supplemental water is  
6 obtained from the Tongue River Reservoir. The  
7 direct flow water rights typically have water  
8 available to them during May and June, and in  
9 most years the river flow drops off usually  
10 during July, and then in the late season there is  
11 not enough water in the river to satisfy the  
12 direct flow, which results in the use of the  
13 storage from the reservoir. Pre-1950 direct flow  
14 water rights are impacted by post 1950 uses in  
15 Wyoming that would occur at those times.

16           With respect to the State of Wyoming, I  
17 have summarized the impacts that I have  
18 quantified for each of the four years that the  
19 reservoir did not fill. Those are summarized on  
20 Table 3 in page 27 in the report.

21           Q       You are referring to the rebuttal report?

22           A       In the rebuttal report, yes.

23           And these include the post 1950 storage  
24 in Wyoming and the direct flow water rights on  
25 post 1950 permits that are in the lower part of

1 the Tongue River Basin and on Prairie Dog Creek.

2 Q And your conclusions with respect to  
3 the direct flow are shown on Table 5-A, page 32  
4 of your rebuttal report; is that right?

5 A Yes.

6 Q And that's the same as the Table 5 in  
7 your original report?

8 A Yes.

9 Q Another item I wanted to go back to, we  
10 had listed for your testimony Exhibits M-1 and  
11 M-2, which are the two maps of the basins that  
12 were in, basically, the same form attached to the  
13 initial pleadings in this case. Have you  
14 reviewed Exhibits M-1 and M-2?

15 A Yes, I have.

16 Q And do they provide a reasonably  
17 accurate set of maps of the area that we are  
18 discussing in this case?

19 A Yes.

20 Q Now, I'd like to review the other  
21 exhibits that are associated with your testimony,  
22 Mr. Book. We have Exhibits M-5 and M-6, those  
23 are your two reports, correct?

24 A Yes.

25 Q In addition, we have identified certain

1 of your references on which you relied as  
2 additional exhibits, and we have referred to some  
3 of these as we've gone through. I'd like to be  
4 sure we've covered them all. Exhibit M-14 is the  
5 Martner Brooks exhibit, and that was referred to  
6 earlier.

7 MR. KASTE: I got to put a stop to this  
8 before it gets out of hand. Just because an  
9 expert relies on something doesn't make it  
10 otherwise admissible. We may have talked about  
11 references in Mr. Book's report, but they haven't  
12 been offered. And if they do get offered, we  
13 haven't had sufficient foundation for the entry  
14 of any of those exhibits.

15 Now, if Mr. Draper wants to move for  
16 the admission of this report and his rebuttal  
17 report, I won't object to those. But that should  
18 have been done before he testified about it. If  
19 we are going to move to admit everything that he  
20 relied on in his report, I have a big objection  
21 with that. They are not otherwise admissible.  
22 It is not necessary for his testimony. Mr. Book  
23 is a big boy. He testified for hours about his  
24 knowledge, and these other materials are not his  
25 creation. You haven't established sufficient

1 foundation for it and it's going to be a  
2 ridiculous waste of our time to go through each  
3 and everything he's read and say, we mentioned  
4 it. Who cares? This case is about his opinion,  
5 not everything he relied on.

6 SPECIAL MASTER: Mr. Kaste, two things.  
7 Number one, this is exactly what I was trying to  
8 avoid in trying to bring up any issues of this  
9 nature beforehand.

10 MR. KASTE: Well, I understand. But I  
11 have no idea how he is proposing to use these  
12 exhibits when I see them in advance. For all  
13 know, we were going to go through page by page  
14 and discuss the minutia of these exhibits that he  
15 relied on. I think I have the opportunity to  
16 object to foundation when they are offered, but  
17 we spent a day without an exhibit offered but for  
18 the organizational chart offered by General Fox.  
19 That's not the appropriate procedure. I need to  
20 have that opportunity before we discuss these  
21 exhibits.

22 SPECIAL MASTER: So second of all, at  
23 this stage, as I understand what Mr. Draper is  
24 about to do, he is going to simply check to see  
25 whether or not Mr. Book relied upon those various

1 documents.

2 MR. KASTE: I will stipulate he relied  
3 in his reference section in his report, which is  
4 all this stuff is.

5 SPECIAL MASTER: And in addition to  
6 that, as far as I can tell, virtually all of  
7 those are public records.

8 MR. KASTE: Great. That doesn't  
9 necessarily mean we ought to admit them in these  
10 proceedings. We don't take judicial notice of  
11 every public record that exists. These pieces of  
12 information that have been identified are not  
13 appropriate exhibits. Just because he relied on  
14 them, doesn't mean they go into evidence.

15 MR. DRAPER: Your Honor --

16 SPECIAL MASTER: Yes.

17 MR. DRAPER: -- if Mr. Kaste's view of  
18 this is accepted, the Supreme Court will be very  
19 disappointed. It's going to be shocked that the  
20 record would be so different than previous  
21 original proceedings that have come to them where  
22 experts have testified and the special master has  
23 provided the expert analysis and all of the basis  
24 in terms of reports and studies that they relied  
25 on, and it is ridiculous, really, to have Mr.

1 Kaste suggesting that this material should be  
2 kept from the Supreme Court, or that in lieu of  
3 that, that we spend a lot of time parsing through  
4 the details of these. These are simply ones that  
5 Mr. Book is prepared to testify that he relied  
6 on, that he believes they are reasonable to rely  
7 on for the purpose that he used them, and they  
8 should be admitted on that basis. And that would  
9 be very consistent with the previous original  
10 proceedings and very consistent with the fact  
11 that the rules of evidence prepared for juries do  
12 not apply, and if they were applied verbatim in  
13 these kind of proceedings, it would be contrary  
14 to the approach that the Supreme Court has  
15 dictated for these kinds of cases throughout the  
16 centuries.

17 MR. KASTE: Well, here's one of the  
18 things we are talking about. That's how thick it  
19 is. It's two inches thick. The Supreme Court  
20 doesn't get to wander through this without the  
21 benefit of expert testimony. And Mr. Book hasn't  
22 testified about this particular document, nor has  
23 he testified about all those things other than to  
24 say he relied on them. It is extraordinary to me  
25 that we would give them 12 feet of paper and say,

1 you are free to wander through that however you'd  
2 like without the benefit of the testimony from  
3 the expert witness. And I think every time you  
4 hear that the rules of evidence don't apply, you  
5 should be asking yourself, what are we trying to  
6 pull here? Why are we trying to avoid doing  
7 things properly?

8           SPECIAL MASTER: So, first of all, my  
9 guess is that ultimately this is all going to be  
10 about virtually nothing, because I can't imagine,  
11 actually, the United States Court will actually  
12 want to go back and take a look at any of the  
13 background documents.

14           At the same time, I do think that it is  
15 relevant to have as part of the record the  
16 documents that Mr. Book relied upon.

17           What I will do at this point is I'm  
18 going, once Mr. Draper actually sets the  
19 foundation for this, I will admit these as the  
20 documents upon which Mr. Book relied, and,  
21 therefore, as foundations for his particular  
22 testimony. I will not admit it for the truth of  
23 the matters, other than in connection with Mr.  
24 Book's testimony, and so if Mr. Draper, or in  
25 your case, Mr. Kaste, at any particular point



1 you're going to want to rely upon one of the  
2 documents for the substance of what's in that  
3 particular document, separate from the  
4 conclusions that Mr. Booker and other expert has  
5 formulated based on that, then we need to  
6 actually set the foundation for entering that as  
7 an exception to the hearsay rule and as relevant  
8 in this particular case.

9 MR. KASTE: If limited for the purpose  
10 you described, I'm okay with that. Thank you.

11 SPECIAL MASTER: Okay. I think that's  
12 the only reason we are likely to actually be  
13 looking at these particular documents if we  
14 actually will. But I actually do think that it's  
15 useful to have in the record what Mr. Book relied  
16 upon so that if anyone ever has any questions,  
17 they can actually take a look at those.

18 Mr. Draper.

19 MR. DRAPER: Thank you.

20 Q (By Mr. Draper:) Mr. Book, Exhibit  
21 M-14 is identified with an author of Martner  
22 dated 1986, Wyoming Climate Atlas. Did you rely  
23 on that particular document?

24 A Yes.

25 Q For what purpose?

1           A           For the evaporation rate.

2           Q           And did you consider it reasonable to  
3 rely upon that document for that purpose?

4           A           Yes.

5           Q           The next exhibit is M-15, United States  
6 Department of Agriculture, National Agricultural  
7 Statistics Service, 2007 Census of Agriculture,  
8 Montana State and County Data, Volume 1,  
9 Geographical Area Series. Did you rely on that  
10 document?

11          A           Yes, I did.

12          Q           For what purpose?

13          A           For agricultural crop data for the  
14 State of Montana.

15          Q           Did you consider this document to be a  
16 reasonable document to rely upon for the purpose  
17 you used it?

18          A           Yes.

19          Q           Exhibit M-16, entitled, Water Resources  
20 Survey, Montana State Engineer and State Water  
21 Conservation Board, History of Land and Water Use  
22 On Irrigated Areas, Big Horn County (1947)  
23 Rosebud County (1948), and Custer County (1948).  
24 Did you rely on that document?

25          A           Yes, I did.

1 Q For what purpose?

2 A For the pre-1950 irrigated area in the  
3 State of Montana.

4 Q And did you consider that a reasonable  
5 document to rely upon for the purpose you used  
6 it?

7 A Yes.

8 SPECIAL MASTER: Mr. Draper, I'm just  
9 thinking about a potential way of saving time, if  
10 its fine with Mr. Kaste, is that during the next  
11 break, that if you have not done so already, you  
12 just ask Mr. Book to review the exhibits that you  
13 would like to have introduced for this limited  
14 purpose by the numbers, and then even if your  
15 examination is complete at that particular point  
16 in time, I'll permit you just simply to ask Mr.  
17 Book for exhibits in such and such, such and  
18 such, did you rely upon those for purposes of  
19 your testimony, was it reasonable to rely upon  
20 them, and I will just admit them in mass. Will  
21 that be will okay you, Mr. Kaste?

22 MR. KASTE: It would be very preferable.

23 SPECIAL MASTER: Okay. Thank you.

24 MR. DRAPER: Great.

25 I think I'm at the point, Your Honor,

1 where I'm ready to move for the admission of all  
2 of the exhibits, and I can withhold the motion  
3 with respect to the sources until after the next  
4 break.

5 SPECIAL MASTER: So what I would  
6 suggest, and then would that be the end at the  
7 moment for the substantive questions you were  
8 going to ask as part of your direct?

9 MR. DRAPER: I think so, after a short  
10 conference with my co-counsel, yes.

11 SPECIAL MASTER: I'm actually going to  
12 have some questions before you actually can  
13 complete your direct examination.

14 MR. DRAPER: Very good.

15 SPECIAL MASTER: What I would actually  
16 suggest at this particular point in time is why  
17 don't you move to introduce the two expert  
18 reports.

19 MR. DRAPER: I so move, Your Honor.

20 MR. KASTE: No objection.

21 SPECIAL MASTER: Okay. Then admitted  
22 in evidence is M-5 and M-6.

23 (Received.)

24 MR. DRAPER: Thank you, Your Honor.

25 SPECIAL MASTER: Okay. So as I said, I

1 would love to ask you some questions at this  
2 point, Mr. Book, if that's okay with you, Mr.  
3 Draper.

4 MR. DRAPER: Please go ahead.

5 SPECIAL MASTER: Okay. What I'm trying  
6 to do more than anything else is just be able to  
7 make sure I fully understand your testimony, so  
8 if I end up relying upon it in my recommendations  
9 to the Supreme Court, I understand it, and also  
10 the court understands it when they look at it.

11 So the first question I have is in your  
12 review of, first of all, the Montana water rights  
13 that you examined in this particular case, in  
14 California I'm used to seasonal water rights,  
15 where most water rights are good for only a  
16 certain time of the year, for example, you have a  
17 right from March to April but you don't  
18 necessarily have a right from May to June. Were  
19 the rights that you examined for Montana in this  
20 particular case, were they for a certain amount  
21 of water year-round or were they also seasonal?

22 THE WITNESS: My review of the records  
23 indicated that that is variable. Some of the  
24 resulting water rights do have seasons of  
25 diversion for irrigation, but not all of them,

1 and it was typical April through October or April  
2 through September when they did this, or when  
3 they do exist.

4 SPECIAL MASTER: And did you take that  
5 into account in your analysis?

6 THE WITNESS: I'm just simply  
7 tabulating the existence of the water rights as  
8 its relates to the priority date, the amount of  
9 flow, and the irrigated acreage, because these  
10 rights are all being used for irrigation and I  
11 know what the irrigation season is out there. So  
12 the existence or non-existence of a season on the  
13 water right wouldn't affect that.

14 SPECIAL MASTER: So if there were a  
15 season, then, it would be extensive or concurrent  
16 with the period of time for which you actually  
17 computed what the demand would be for that right?

18 THE WITNESS: Yes.

19 SPECIAL MASTER: And similarly, were  
20 any of the Wyoming water rights seasonal, in that  
21 they were limited to certain times of the year,  
22 to your memory?

23 THE WITNESS: Not that I'm aware of.

24 SPECIAL MASTER: Okay. Thank you. And  
25 so next, if you could turn to Table 3 in Exhibit

1 M-5, which is your January report. Could you  
2 explain for me, again, the purpose of Table 3.

3 THE WITNESS: Table 3 is to provide  
4 background information of the development of  
5 irrigation in the Tongue River Basin in Wyoming,  
6 and this compares the acreage that was documented  
7 at the time of the Compact with the Bureau of  
8 Reclamation mapping to the 2002 acreage, which  
9 was derived for the year 1996, and the recent  
10 study that the State of Wyoming had conducted,  
11 and then also for comparison with the results  
12 that I had determined from the aerial photographs  
13 and the metric for 2006.

14 SPECIAL MASTER: And were there any  
15 particular conclusions that you drew from Table  
16 3?

17 THE WITNESS: Well, there had not been  
18 a reduction in irrigated acreage in the basin,  
19 the pre-Compact level of acreage is approximately  
20 -- was approximately 69,000 acres, and the  
21 acreage derived at the time of the 2002 Basin  
22 Plan was approximately 70,400. There had been  
23 increased acreage developed in the Prairie Dog  
24 Creek Basin. Other than that, the acreage  
25 overall has been fairly stable. And that led me

1 to the conclusion that in evaluating post '50  
2 acreage I needed to be working with the post 1950  
3 water right in Wyoming, because the water rights  
4 are specific to acreage.

5           SPECIAL MASTER: Okay. Thank you. So  
6 I want to talk for a moment about the studies  
7 that you did of the Montana direct flow demand.  
8 And so I'm looking in particular now at pages 9  
9 to 11 of your January report. And, first of all,  
10 just a clarification on the written testimony,  
11 and that's on page 10, the second bullet, you  
12 note that demand for water is equal to the water  
13 rights flow rate for the peak diversion months of  
14 July and August and is scaled down for the other  
15 months, you mention May, June, and October, and I  
16 assume you mean to include September on that  
17 list.

18           THE WITNESS: I did.

19           SPECIAL MASTER: Okay. Thanks. Second  
20 of all, so if I understand the way in which you  
21 calculated the direct flow demand for the non-T&Y  
22 Canal acreage, that what you did was you took the  
23 amount of the pre-1950 acreage and then you  
24 multiplied that by the 1 cfs for 40 acres?

25           THE WITNESS: Yes, that's correct.



1           SPECIAL MASTER: And the 1 cfs per 40  
2 acres is the water duty?

3           THE WITNESS: That was the duty of  
4 water in the 1914 Miles City decree.

5           SPECIAL MASTER: Okay. And earlier in  
6 your report you had calculated crop ET.

7           THE WITNESS: Yes.

8           SPECIAL MASTER: Is there a reason why  
9 in doing the direct flow demand analysis you used  
10 the water duty from the 1914 Miles City decree  
11 rather than the ET estimate that you had  
12 performed earlier in your report?

13          THE WITNESS: Yes. The purpose of the  
14 analysis was to determine how much water would  
15 need to be in the river to satisfy the water  
16 rights based on the amount of the water right  
17 itself. Direct flow water rights are expressed  
18 in a flow rate, a rate of flow, an ET analysis,  
19 and a crop water budget analysis would give you a  
20 volume of water over some period of time, but the  
21 existence of a direct flow water right gives the  
22 user the right to expect a certain flow rate at  
23 any given point in time. So I based it on the  
24 water right flow rate.

25          SPECIAL MASTER: So to be absolutely

1 clear, then, the direct flow demand that you  
2 analyze at page 9 to 11, and summarize at the  
3 table on page 11, is your calculation of the  
4 entitlement of each of the users, each of the  
5 pre-1950 water right holders, based on the number  
6 of acres that they have and the water duty from  
7 the 1914 Miles City decree?

8 THE WITNESS: Yes. And it should be  
9 recognized that the duty of water from the Miles  
10 City decree is not the standard that is currently  
11 in the Montana water rights, those are different  
12 rates of flow, but the duty of water from the  
13 1914 decree was what I had used.

14 SPECIAL MASTER: And do you know whether  
15 or not the current duty is higher or lower?

16 THE WITNESS: I'm not sure if there is  
17 a specific duty of water that is being applied.  
18 What I did was tabulate the amount of acreage and  
19 the flow rate, and the composite overall was a  
20 duty of water that was more than 1 to 40, when  
21 you looked at the total from my list. I don't  
22 know if there's a specific duty of water that  
23 they use or not.

24 SPECIAL MASTER: And then you took your  
25 calculation based on the amount of pre-1950

1 acreage, the water duty from the 1914 Miles City  
2 decree, and then you added to that the amount for  
3 the rate that was established in the Miles City  
4 decree for the T&Y Canal?

5 THE WITNESS: Yes.

6 SPECIAL MASTER: And so earlier when you  
7 did the crop ET analysis, you actually did the  
8 analysis for both Wyoming and Montana; is that  
9 correct?

10 THE WITNESS: Yes, I did.

11 SPECIAL MASTER: And I understand how  
12 you use the ET rate for the Wyoming acreage in  
13 your report. Do you use the Montana ET anywhere  
14 in the report?

15 THE WITNESS: It's a component of the  
16 direct flow analysis, because I was assuming  
17 diversions at the direct flow rate, and then I  
18 was calculating return flows as the net of the  
19 diversions minus the crop consumptive use.  
20 That's the only place where that analysis comes  
21 into play in Montana.

22 SPECIAL MASTER: Okay. Thank you.

23 And, also, on the calculations of the  
24 direct flow demands for the pre-1950 uses that  
25 you have in the table on page 11, as you note in

1 your report, you assume a hundred percent demand  
2 for June -- I'm sorry, for July and August, and  
3 then you scaled down that for the other four  
4 months of your analysis, and you earlier gave the  
5 percentages, but I did not hear how you actually  
6 derived the particular percentages.

7 THE WITNESS: Yes, those percentages  
8 were from Appendix E-13 on page 280. I derived  
9 those percentages from my review of the T&Y Canal  
10 diversion records. That was the table of the  
11 historical diversions for the T&Y Canal and the  
12 graph that I displayed at the bottom of that page  
13 on 277. And those percentages are expressed on  
14 the table on E-13.

15 SPECIAL MASTER: Okay. So if I  
16 understand this again, then what you looked at  
17 was the percentage of water that the T&Y Canal  
18 diverted compared to what the amount that they  
19 were decreed?

20 THE WITNESS: Yes.

21 SPECIAL MASTER: Is that correct as to  
22 the first step?

23 THE WITNESS: Yes.

24 SPECIAL MASTER: And then you used those  
25 same percentages then for the other pre-1950

1 water rights in Montana on the Tongue River; is  
2 that correct?

3 THE WITNESS: Yes.

4 SPECIAL MASTER: Again, if I  
5 understand, what you estimated was the  
6 amount that -- you started by the amount that  
7 each of the pre-1950 water right holders could  
8 demand based on the number of acres that they  
9 held and the water duty from the 1914 Miles City  
10 decree, is that correct?

11 THE WITNESS: Yes.

12 SPECIAL MASTER: But you then scaled it  
13 back based -- you scaled it back for four months  
14 based on the fact that although they might have  
15 that right, that they wouldn't necessarily demand  
16 all that water?

17 THE WITNESS: That's correct.

18 SPECIAL MASTER: Then could you turn  
19 then, again, to page 16 of your June report,  
20 which is the table on irrigated lands in the  
21 Tongue River Basin of Montana, the pre-1950  
22 active irrigation surface water rights, and it's  
23 for three years, 2005, 2009, and 2011. So are  
24 those numbers based on looking at the areas for  
25 which water rights exist and then the aerial

1 photographs for each of those three years?

2 THE WITNESS: Yes.

3 SPECIAL MASTER: Okay. And so if there  
4 was a water right attached to a particular acre  
5 and you saw it being irrigated from those aerial  
6 photographs, then you included it for the  
7 relevant year?

8 THE WITNESS: Yes.

9 SPECIAL MASTER: The table on page 16  
10 shows the total acreage. The table on page --  
11 I'm sorry, let me rephrase that. The table on  
12 page 16 of the June report shows acreage, and the  
13 table on page 11 of your January report is the  
14 estimated direct flow demands. What I'm trying  
15 to determine is how to compare those two, and,  
16 obviously, you can't directly compare those. So,  
17 first of all, on page 11, the acreage that is  
18 associated with those numbers, is that shown in  
19 your January report?

20 THE WITNESS: Yes, it is. I think the  
21 best place to see that --

22 SPECIAL MASTER: Is it Table E-6, or  
23 Figure --

24 THE WITNESS: In E-6, that is correct,  
25 and the total acreage is shown on E-6 as 19,983

1 acres.

2 SPECIAL MASTER: Okay. So then could  
3 you compare for me what is shown on Appendix E-6  
4 of your January report and what is shown on the  
5 table on page 16 of your June report?

6 THE WITNESS: Yes. The acreage on  
7 Appendix E-6 corresponds to the pre-1950  
8 irrigated acreage in Montana as derived from the  
9 surveys, Montana Water Resource Surveys, and it  
10 includes the service area under the T&Y Canal.  
11 The acreage shown on page 16 corresponds to the  
12 current configuration of the pre-1950 water  
13 rights on the Tongue River upstream of the T&Y  
14 Canal, and further is limited to the acreage that  
15 was determined to actually be irrigated in each  
16 of those three years. And it excludes the T&Y  
17 Canal, which is approximately slightly less than  
18 10,000 acres. So that's why you're comparing  
19 numbers ranging from 8300 to 9500 with a number  
20 that's 19,983, because that includes the T&Y  
21 Canal. The directly comparable numbers would  
22 exclude the T&Y Canal.

23 SPECIAL MASTER: But the numbers shown  
24 on the table on page 16 of your June report is  
25 comparable then to the other pre-1950 acres shown

1 on Appendix E-6, other than the T&Y Canal?

2 THE WITNESS: Yes, that's correct.

3 SPECIAL MASTER: Okay.

4 And why in your table on page 16, did  
5 you use the years 2005, 2009, 2011?

6 THE WITNESS: 2009 was my original  
7 analysis in Montana. 2011 was more recent aerial  
8 photography coverage that provided a more recent  
9 condition to current condition. Also, the  
10 quality of the aerial photograph was better for  
11 2011. I don't have any other particular reason  
12 for the selection of the year 2005. I don't  
13 recall exactly. That's comparable to what I was  
14 looking at for the Wyoming acreage at 2006.

15 SPECIAL MASTER: Thank you. And based  
16 on the acres shown on page 16 of your June  
17 report, did you do any recalculation of the  
18 estimated direct flow demands shown on page 11 of  
19 your January report?

20 THE WITNESS: No, I did not.

21 SPECIAL MASTER: Then turning to the  
22 Tongue River Reservoir, the first question is on  
23 Figure 5 of your January report, which is, I  
24 don't know which page it is, but it's Figure 5,  
25 which is the Tongue River Reservoir, maximum



1 annual end-of-month contents. So I notice for  
2 some years that the actual end-of-month contents  
3 appear to exceed what I understood to be the  
4 capacity of the reservoir. And so, for example,  
5 take an obvious example, going back to 1944, it  
6 seems to suggest an end-of-month content of  
7 something of the nature of 75,000 acre-feet.

8 THE WITNESS: Yes.

9 SPECIAL MASTER: So how do you end up  
10 with calculations that have the maximum end-of-  
11 month contents greater than the capacity?

12 THE WITNESS: Typically, there's flood  
13 pool surcharge in a reservoir in general that you  
14 wouldn't operate the reservoir in that stage, but  
15 if you had recently had a large inflow event and  
16 the reservoir was holding flood flow back, you  
17 will experience storage up into what's sometimes  
18 termed the flood pool, and that will exceed the  
19 normal operating capacity of a reservoir. That's  
20 the primary reason that I could think of. And  
21 that would show up as -- I mean, we took the  
22 maximum end-of-month content here, so that would  
23 show up if it was, you know, of duration of more  
24 than a month.

25 SPECIAL MASTER: Okay. And then on

1 page 54, which is the Figure 6, the Tongue River  
2 Winter Reservoir Outflow Versus Stateline Flow,  
3 could you tell me what you concluded based on  
4 this table?

5 THE WITNESS: That the conclusion from  
6 this table was that the bypass flow rates which  
7 have occurred since 2000, when expressed as a  
8 function of the inflow to the reservoir, are of  
9 comparable relationship to the operation of the  
10 reservoir that had occurred prior to 1950. That  
11 is one response regarding the issue of storage of  
12 bypass flows in the wintertime. One response is  
13 that was the way the reservoir had been operated  
14 over a long period of time, including prior to  
15 1950, generally the past winter flows at the  
16 levels that they were passed prior to 1950. So  
17 what this graph shows is the reservoir outflow  
18 rates for this season on the left hand, or the Y  
19 axis.

20 SPECIAL MASTER: So let me see if I can  
21 restate that just so I understand. So are you  
22 suggesting, first of all, if you look at the  
23 pre-1950 data are the diamonds?

24 THE WITNESS: Yes, that's correct.

25 SPECIAL MASTER: Okay. And if you look

1 at those, your suggestion is that there is a  
2 direct relationship between the stateline flow  
3 and the reservoir outflow.

4 THE WITNESS: Yes. I'm not looking so  
5 much at the relationship here. I'm not  
6 attempting to draw a regression line through  
7 this, although the data does suggest that there  
8 is a relationship there. It's more to look at  
9 the quantities of flow that were being bypassed,  
10 and compare those over the two periods. And one  
11 reason there may be a difference would be because  
12 the quantity of inflow was different. And you do  
13 see that between these two periods. The inflows  
14 were higher pre-'50s and the outflows were higher  
15 pre-'50s.

16 SPECIAL MASTER: Also, just so I again  
17 totally understand this particular table and the  
18 figure underneath it, in those years, so this is  
19 a November to March period, so in this particular  
20 figure and the table there, the outflow is  
21 greater than the stateline flow for this period.  
22 That suggests during that period, November to  
23 March, they actually released water from the  
24 reservoir in addition to what was flowing in?

25 THE WITNESS: Yes, that's what that

1 suggests.

2 SPECIAL MASTER: Okay. Then on your  
3 June report, again, on the reservoir, if you  
4 could turn to Figures 9-A and 9-B, again, I just  
5 want to make sure I understand these. It's a  
6 little bit more difficult to understand these,  
7 because I know Mr. Hinckley has not testified yet.

8 Could you explain what you have added  
9 to these particular charts?

10 THE WITNESS: Yes. The only thing I've  
11 added is the red line at the 45,000 acre foot  
12 content limit, which in here it's for the winter  
13 months. So that would go -- so if you look at  
14 the extent of the red line going across, it's  
15 shown for the winter months but not for the  
16 summer months.

17 SPECIAL MASTER: So I just want to make  
18 sure, because it's a little bit different color  
19 on my particular copy, so, for the record, this  
20 is the dashed line that is at about that 45,000  
21 figure?

22 THE WITNESS: Yes.

23 SPECIAL MASTER: Then turning to your  
24 Table 7, do you have that in front of you?

25 THE WITNESS: Yes, I do.

1           SPECIAL MASTER: So the various numbers  
2 that are shown on this particular table, so, for  
3 example, the 79,782 number, those are estimates  
4 as to the amount of water that would be in the  
5 reservoir at the end of March, based on various  
6 assumptions?

7           THE WITNESS: Yes.

8           SPECIAL MASTER: And the first column  
9 shows an assumption of a 50 cfs bypass and a  
10 45,000 acre foot maximum winter storage?

11          THE WITNESS: No, there's no maximum  
12 storage included in these two columns. These are  
13 the results from Mr. Hinckley's analysis which  
14 did not constrain the storage to the 45,000.

15          SPECIAL MASTER: Okay. So the notation  
16 at the bottom of the 45,000 acre-foot is really  
17 irrelevant to this particular table?

18          THE WITNESS: Yes, I believe it is.

19          SPECIAL MASTER: Okay. So let's go  
20 then to the analyses you did of the Wyoming  
21 rights. So start, again, with your January  
22 report. So looking first at Table 12, which is  
23 at page 43. So the various post 1950 impacts  
24 that you show here are for what period of time?

25          THE WITNESS: Specifically, for the

1 four years listed here 2001, 2002, 2004, and  
2 2006. For those items for which I did not have  
3 specific information for 2001 and 2002, I used  
4 the average of the 2004 and 2006.

5 SPECIAL MASTER: And is the impact here  
6 for the entire water year?

7 THE WITNESS: Yes.

8 SPECIAL MASTER: So that would then be  
9 from -- when does the water year begin and end?

10 THE WITNESS: October 1 through the end  
11 of September.

12 SPECIAL MASTER: So the impact here  
13 would be when you show 2001, it would be October  
14 1 of 2000 through September 30, 2001?

15 THE WITNESS: Yes, sir.

16 SPECIAL MASTER: And similarly for each  
17 of the various other years?

18 THE WITNESS: Yes.

19 SPECIAL MASTER: And then if we look,  
20 first, at the Compact reservoirs, if you look,  
21 for example, at Table 7, which is the post 1950  
22 storage. So, again, that post 1950 storage shown  
23 in Table 7 is for the entire water year?

24 THE WITNESS: Yes, the storage occurs  
25 usually by the end of May. So it would be

1 starting in the fall through May.

2           SPECIAL MASTER: And I believe you  
3 indicated in your direct testimony that you did  
4 not see a way in which you could take the data  
5 and actually determine when that storage took  
6 place. So whether you said that or before or  
7 not, let me ask that as a question. Did you look  
8 to see whether or not there was any way that you  
9 could actually look to see when this storage  
10 occurred?

11           THE WITNESS: Do you mean by specific  
12 months of the year?

13           SPECIAL MASTER: Yes, let's take  
14 specific months.

15           THE WITNESS: That's my understanding,  
16 that's not possible, other than that it occurs  
17 between the fall and the runoff season when  
18 access to the reservoir occurs, which is usually  
19 around May 1st.

20           SPECIAL MASTER: I'm sorry that I'm  
21 taking some time in between each of my questions,  
22 but I'm going back and forth between various  
23 tables. So then if you turn to Table 3 in your  
24 June report, which is the summary of post 1950  
25 impacts to stateline, so just to ask the same

1 question I asked a moment ago with respect to  
2 Table 12, the figures here are the impacts for  
3 the entire water year?

4 THE WITNESS: Yes.

5 SPECIAL MASTER: And could you also  
6 explain for me under the Compact reservoirs,  
7 there is the column to the right that says, with  
8 Kearney Lake Reservoir post 1950 return flows.  
9 So did you calculate those figures?

10 THE WITNESS: Yes, I did.

11 SPECIAL MASTER: And could you explain  
12 what those figures indicate?

13 THE WITNESS: Yes. The last column out  
14 here is informational, because I do the  
15 subtraction of Kearney Lake return flows also at  
16 the bottom of this table to get to the bottom  
17 line, but because they were associated with post  
18 1950 storage, I also showed them here. So the  
19 column to the left is the net impact at the  
20 stateline before I accounted for the Kearney Lake  
21 Reservoir return flows, and then when I take the  
22 return flow number and subtract that from the  
23 net, that is the effect of the post '50 storage  
24 for that year.

25 SPECIAL MASTER: So, again, the way in



1 which you calculated that column to the far right  
2 on the Compact reservoirs, was to subtract the  
3 numbers shown at the bottom of the page indicated  
4 Kearney Lake return flow from the column up under  
5 Compact reservoirs labeled Net At Stateline?

6 THE WITNESS: Yes, that's correct.

7 SPECIAL MASTER: Okay. And then  
8 turning back to the January report, so I want to  
9 talk just for a minute about the Wagner and  
10 Five-Mile reservoirs. So could you -- let me  
11 start out just by foundational question. So your  
12 calculations for these reservoirs was based on  
13 testimony at depositions; is that correct?

14 THE WITNESS: Documents and testimony.

15 SPECIAL MASTER: Okay. And did you,  
16 taking those documents and testimony, did you  
17 make any adjustments to those, or was it based  
18 directly on the numbers that you pulled out of  
19 those documents and testimony?

20 THE WITNESS: There is interpretation  
21 involved in determining the amount of water that  
22 was available in storage and used that year. I'm  
23 not sure that you can go directly to a specific  
24 document and find the exact number. In my  
25 opinion, the documents that I had were

1 interpretable to determine that amount, and there  
2 was testimony in the deposition as to how you  
3 would determine that amount, too, if the number  
4 didn't actually show up in a document.

5           SPECIAL MASTER: And then on page 15,  
6 that fourth paragraph, it says, the reservoirs  
7 ability each year of water diverted through the  
8 Wyoming and Five-Mile ditch, and you say  
9 Five-Mile Reservoir is filled first until March.  
10 So does that mean that any of the post 1950 water  
11 stored in the Five-Mile Reservoir would have been  
12 stored there prior to March?

13           THE WITNESS: That was my understanding,  
14 is that the way the storage is sequenced in this  
15 system, it's sequenced from one reservoir to the  
16 other. I don't know exactly in a given year if  
17 there was no storage after March. That's  
18 possible that storage could continue after March  
19 if it wasn't full, or if water were available.

20           SPECIAL MASTER: But this was --

21           THE WITNESS: The general operational  
22 description.

23           SPECIAL MASTER: So then this is based  
24 here on, again, your reading of the testimony and  
25 the documents?

1 THE WITNESS: Yes.

2 SPECIAL MASTER: And then you say, and  
3 then water is stored in Wagner Reservoir until  
4 the irrigation season begins. When you say the  
5 irrigation season begins, when is that?

6 THE WITNESS: May.

7 SPECIAL MASTER: Okay. And then we  
8 look at the post 1950 irrigated acreage analysis  
9 starting on pages 17 to 19, one of the things  
10 that you mention both in the second and third  
11 paragraphs is that you did not evaluate post 1950  
12 supplemental water rights. And why did you not  
13 analyze those?

14 THE WITNESS: As supplemental water  
15 supply to another primary water right, it would  
16 be very complicated in my opinion to try to sort  
17 out and attribute water between the sources. A  
18 supplemental water right is just what it says,  
19 it's supplemental water. A lot of those tend to  
20 be from a source of water that might be more  
21 dependable than the primary supply. That's at  
22 least what we see on some of those down on the  
23 interstate ditch where the primary water right  
24 was from a tributary and the supplemental supply  
25 was from the interstate. What that implies is

1 you got a mixed source of pre and post 1950 water  
2 on a particular tract. The records are not  
3 available to try to sort that out.

4 SPECIAL MASTER: And then, finally, I'm  
5 getting to the end here, so again turning back to  
6 the June report and to your Table 3, looking at  
7 the post 1950 acreage, the various numbers that  
8 are shown for under the line, Tongue River and  
9 Prairie Dog Creek, are your estimates after doing  
10 your June analysis of the irrigated acreage  
11 depletion, et cetera; is that correct?

12 THE WITNESS: Yes.

13 SPECIAL MASTER: And the column without  
14 CBM would be the estimates for those acres --  
15 well, let me ask. What's the lines that say,  
16 without CBM?

17 THE WITNESS: The report that we  
18 received from Mr. Fritz had documented some of  
19 these tracts had been irrigated with CBM water  
20 based on a map that he produced to us. And after  
21 reviewing the information, and in a couple of  
22 instances reevaluating that acreage, I concluded  
23 that the evidence indicated that there was CBM  
24 water applied to some of those lands. And so  
25 without CBM is the acreage and ET adjusted or

1 removing those lands irrigated with CBM.

2 SPECIAL MASTER: Okay. Those are my  
3 questions for the moment. Mr. Draper, did you --  
4 well, this might be a good time to take a break  
5 and then you can come back, you can establish the  
6 foundation for admitting the other exhibits into  
7 evidence for the limited purposes which I  
8 mentioned earlier. And then you are free to ask  
9 any additional questions in follow-up to my  
10 questions. And then it will be time for  
11 cross-examination.

12 MR. DRAPER: Very good.

13 SPECIAL MASTER: So why don't we come  
14 back at 11 a.m..

15 (Recess.)

16 SPECIAL MASTER: You may be seated. Mr.  
17 Draper.

18 MR. DRAPER: Thank you, Your Honor.

19 Q (By Mr. Draper:) On the subject of  
20 exhibits, I'd like to first refer to Exhibits M-1  
21 and M-2, these are the maps that were submitted  
22 originally in the pleadings in this matter. Mr.  
23 Book, have you reviewed the Exhibits M-1 and M-2?

24 A Yes.

25 Q And are they accurate depictions of the

1 area subject to this proceeding?

2 A Yes.

3 Q There are several exhibits like that  
4 that I would move for general purposes without  
5 limitations, and I'll ask Mr. Book, regarding  
6 Exhibit M-32, the Montana water right claim  
7 examination rules, and M-243, the Miles City  
8 decree, and M-458 to 480, did you rely on those  
9 sources?

10 A Yes, I did.

11 Q And are they generally reliable for  
12 purposes of this case?

13 A Yes.

14 MR. DRAPER: Your Honor, I would move  
15 the admission without limitation of Exhibits M-1,  
16 M-2, M-32, M-243, and M-458 to 480.

17 Incidentally, that last group are the hydrographer  
18 reports of the State of Wyoming for Division II.

19 SPECIAL MASTER: Okay. And just to go  
20 over again, so M-32 --

21 MR. DRAPER: Those are the Montana  
22 Water Rights rules amended by the Montana Supreme  
23 Court effective December, 2006.

24 SPECIAL MASTER: And M-243 is the Miles  
25 City decree. Okay. Mr. Kaste.

1           MR. KASTE: I don't object to M-1 and M  
2 2, and 243. With regard to M-32, M-458 through  
3 480, I believe they should be admitted only for  
4 the limited purpose of showing they were relied  
5 on by the expert and not for the truth of any of  
6 the matters in there in the absence from  
7 additional foundation from a qualified witness.

8           MR. DRAPER: Your Honor, these are  
9 public documents. There is no dispute as to  
10 their authenticity. The hydrographer reports are  
11 produced by the State of Wyoming itself. And  
12 they are appropriate matters to be admitted  
13 without limitation in this proceeding.

14           MR. KASTE: Foundation is my objection.  
15 This is not the appropriate witness from whom we  
16 should receive these exhibits.

17           SPECIAL MASTER: So I'm going to admit  
18 at this particular point M-1, M-2, M-32, and  
19 M-243. On M-458 to M-480, I think that you  
20 should be able to be able to lay a foundation,  
21 Mr. Draper, with one of the Wyoming witnesses.  
22 I'm sure I will ultimately let it in, but I agree  
23 with Mr. Kaste, let's have a little bit more  
24 foundation on actually what the basis of those  
25 are.

1 MR. DRAPER: All right. And so you're  
2 limiting the purposes for which you're admitting  
3 them at this time to the uses made of them by Mr.  
4 Book?

5 SPECIAL MASTER: That's correct. But  
6 once there is testimony with respect to what the  
7 hydrographer's annual reports are and the purpose  
8 by which -- or the purposes for which they are  
9 prepared, I will be happy to enter them for all  
10 purposes.

11 MR. DRAPER: Thank you. Your Honor,  
12 you invited me to ask any follow-up questions.

13 SPECIAL MASTER: That's correct. Let  
14 me just stop there for a second. There were --  
15 so right now, just to clarify, M-1, M-2, M-32,  
16 and M-243, as well as M-5 and M-6 have all been  
17 admitted into evidence. M-458 to M-480 are ones  
18 that have been admitted into evidence for  
19 purposes of showing what it is that Mr. Book  
20 relied upon for purposes of his report. As I  
21 say, with proper foundation, I'll be happy to  
22 admit those later for all evidentiary purposes.

23 But there were a number of other  
24 documents that I know you referred to over the  
25 past couple of days, as well as others that you



1 had actually begun to walk through this morning.  
2 So I want to make sure that we have those  
3 covered.

4 MR. DRAPER: Yes.

5 Q (By Mr. Draper:) Let me address those  
6 now, if I may. With reference those, and I'll  
7 name the exhibits first, Exhibits M-14, 15, and I  
8 won't use the M prefix if that's all right. I  
9 will start again. M-14, M-15, 16, 17, 18, 19,  
10 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31,  
11 34, and 36. Are those reports and materials, Mr.  
12 Book, which you relied on in this proceeding for  
13 purpose of your expert opinions?

14 A Yes, they are.

15 Q And are they appropriate sources to  
16 rely upon, in your opinion, for the purposes you  
17 relied on them in this case?

18 A Yes.

19 MR. DRAPER: Your Honor, I would then  
20 move the admission of those exhibits I just  
21 listed to substantiate and reflect the purposes  
22 of use that Mr. Book made of those exhibits.

23 SPECIAL MASTER: Thank you very much.  
24 So assuming no objection.

25 MR. KASTE: With that limitation in

1 place, no other objection, yes.

2 SPECIAL MASTER: Okay. Great. Then  
3 under those circumstances, those are admitted for  
4 the limited purposes stated earlier.

5 (Received.)

6 MR. DRAPER: Thank you.

7 One question of clarification,  
8 following up on your questions, Your Honor.

9 SPECIAL MASTER: That's fine.

10 Q (By Mr. Draper:) Mr. Book, Special  
11 Master asked you, I believe it was with respect  
12 to your January report, Table 7, page 37, and  
13 that table is entitled, Wyoming Post 1950 Storage  
14 Tongue River Basin Reservoirs, he asked you  
15 whether those were values for the whole year. I  
16 believe you answered yes. He asked you whether  
17 it was possible to determine those values for  
18 shorter period than a year. Would you clarify  
19 your answer on that, please?

20 A My answer to that is that the records  
21 of storage do not provide discrete points of time  
22 during the season when the storage has occurred.  
23 That was not to imply that some analysis couldn't  
24 be developed based on available information to  
25 analyze that.

1 MR. DRAPER: Thank you. Your Honor, I  
2 think that concludes my questions, and I'll pass  
3 the witness.

4 SPECIAL MASTER: Okay. Thank you very  
5 much, Mr. Draper. Okay, Mr. Kaste, cross-  
6 examination.

7 I assume you have some.

8 MR. KASTE: Yeah.

9 The thing that concerns me greatly  
10 about having this many materials in there, is  
11 that you, the Supreme Court, or in future  
12 briefings, I see facts pointed out of those that  
13 we didn't hear in the courtroom here today that I  
14 have to try to respond to. In admitting all of  
15 these things causes me a tremendous amount of  
16 trepidation about what's likely to come in the  
17 future. So I appreciate your limiting  
18 instruction. Apologize for getting a little  
19 wound up. Sometimes I do that.

20 SPECIAL MASTER: Mr. Draper.

21 MR. DRAPER: Your Honor, in response to  
22 Mr. Kaste's further argument on that question, I  
23 think the fear that he has that a statement in a  
24 report that hasn't been testified to or used by  
25 an expert is somehow going to become an explosive

1 issue at a later time is not a likely possibility.  
2 I've never seen it happen in the history of the  
3 Supreme Court. They've been doing for a couple  
4 of centuries. It's a red herring, in my view,  
5 for Mr. Kaste to suggest that these records are  
6 going to be misused by yourself and by the  
7 Justices in reaching a decision in this case.

8           SPECIAL MASTER: So I appreciate all  
9 the argument. Actually, I feel we probably spent  
10 more time discussing this issue than we probably  
11 need to. As I said, I think the major reason why  
12 we need those in the record at the moment is if  
13 the Supreme Court ever wants to know what is it  
14 that Mr. Book actually relied upon in formulating  
15 his testimony, it's available. To the degree  
16 that there are purposes for which either side  
17 wants to actually refer to the exhibits for other  
18 purposes, then we should have them in the record  
19 and admitted for the truth of what the documents  
20 say. And at that point I will make sure that  
21 there is a valid hearsay exception, as well as  
22 the correct foundation laid on the documents.

23           And the only reason I'm holding back on  
24 M-458 to M-480, I think it would be useful to  
25 have testimony on the record as to what those

1 documents are, how they are developed, and what  
2 they are used for. And then once I have that  
3 type of foundation, then I'm likely to admit  
4 those for all purposes.

5 MR. KASTE: Thank you.

6 MR. DRAPER: Thank you, Your Honor.

7 SPECIAL MASTER: Thank you, Mr. Draper.

8 CROSS-EXAMINATION

9 Q (By Mr. Kaste:) Good morning, Mr. Book.

10 A Good morning.

11 Q Early on in your testimony you talked  
12 about the 2006 Hydrographer's Annual Report  
13 created here in Division 2 in Wyoming. Do you  
14 remember that?

15 A Yes.

16 Q It was Exhibit J-62. You can take my  
17 word for it. Did you find any comparable  
18 hydrographer reports from Montana?

19 A No.

20 Q In the course of the work you've  
21 performed in this case, just give us a sense,  
22 when did you start working on this case?

23 A About the time that the case was filed  
24 is when I became involved and started doing some  
25 technical work.

1 Q 2007?

2 A Yes.

3 Q Okay. And in the course of your work  
4 we can agree you didn't perform any field  
5 studies, correct?

6 A That's correct.

7 Q And in the course of your work you did  
8 not attempt to quantify post 1950 depletions in  
9 years other than 2001, 2002, 2004, and 2006,  
10 correct?

11 A Those are the years that I specifically  
12 developed depletions for in Wyoming, that's  
13 correct.

14 Q All right. And you didn't quantify  
15 depletions to specific ranches or farms in  
16 Montana, correct?

17 A That's correct.

18 Q And if I understand right, your  
19 quantification and assessment of the causal  
20 relationship between the post 1950 depletions you  
21 identified in Wyoming is specific to the Tongue  
22 River Reservoir?

23 A It's specific to the stateline, and  
24 those are annual values and the reservoir would  
25 be filling while it's in priority, but once you

1 get past that point in the season, then the  
2 impacts would translate to other water rights  
3 down the system. So I'm not sure it's  
4 technically correct to limit it to the reservoir.  
5 The reservoir happens to be a significant  
6 facility right below the stateline. But the  
7 impacts would be different depending on whether  
8 the reservoir is in priority to store or is  
9 passing water for downstream direct flow rights.

10 Q So it depends on the time when the  
11 depletion occurs whether it impacts the reservoir  
12 or some other water right?

13 A Yes.

14 Q Okay. Now, if I understand right, you  
15 didn't quantify the irrigation demand for post  
16 1950 rights in Montana?

17 A That's correct.

18 Q And we can agree that there are  
19 irrigated lands between the stateline and the T&Y  
20 Canal irrigated with post 1950 water rights?

21 A Yes.

22 Q In fact, if I understand your report,  
23 your original report from January, I think we  
24 agreed in your deposition that there are  
25 approximately 4,000 acres of land irrigated with

1 post 1950 rights between the stateline and the  
2 T&Y Canal. Do I have that right?

3 A Yes.

4 Q Now, I also understand that you did not  
5 attempt to evaluate the effects of post 1950 uses  
6 in Montana on pre-1950 uses in Montana, correct?

7 A That's correct.

8 Q Consequently, I guess, you did not  
9 attempt to ascertain what post 1950 rights in  
10 Montana may have been receiving water from the  
11 stateline, from Miles City, at any given point in  
12 time during the years covered by your analysis?

13 A That's correct, I did not.

14 Q So we can agree that there could have  
15 been one or multiple post 1950 water right  
16 holders in Montana in the years covered by your  
17 report that were receiving water after the call  
18 date of May 18, 2004, and July 28, 2006?

19 A I don't understand the question.

20 Q All right. There are post '50 rights  
21 in Montana. You didn't attempt to quantify them  
22 and you didn't attempt to ascertain whether or  
23 when they received water in the years covered by  
24 your analysis, so you don't know and haven't  
25 attempted to ascertain whether any of those



1 rights were receiving water after any specific  
2 date in 2004, 2006?

3 A That's correct, I did not.

4 Q And, of course, you didn't go out and  
5 ascertain specifically whether anybody on either  
6 side of the state actually got water. You didn't  
7 do any field studies, right?

8 A I had the records available as well as  
9 the descriptions that were provided to me by the  
10 Montana officials and Mr. Hayes to describe how  
11 the system operates. So I'm aware of water use  
12 having occurred and how it occurs and through  
13 what facilities it occurs.

14 Q All I'm suggesting is you didn't go out  
15 and look at water yourself, these are reports  
16 from other sources. Of course, you weren't even  
17 hired in '04 and '06, right?

18 A That's correct, I was not out there in  
19 those two years.

20 Q All right. Now on page 10 of your  
21 report you make a statement which, of course, I  
22 love, which is that you assumed a minor amount of  
23 water was undivertable at the T&Y Canal, correct?

24 A Correct.

25 Q And that minor amount of water was how

1 many cfs?

2 A Could you refer me to that page again?

3 Q Page 10.

4 A This is the amount of flow that I  
5 consider undivertible at the T&Y Canal head gate,  
6 I think you should compare that to the  
7 approximately 200 cfs that that water right is at  
8 that canal structure. It's 10 cfs.

9 Q Okay. The amount that you considered  
10 undivertable and what you considered a minor  
11 amount was 10 cfs, right?

12 A Yes.

13 Q All right. And, of course, 10 cfs is  
14 more than double the amount that you find on  
15 Table 3 in your rebuttal report on your bottom  
16 line number for any particular year, for '01,  
17 '02, '04, or '06, 10 cfs is at least double any  
18 of the numbers that you find on Table 3, isn't it?

19 A Yes, if you express those as a flow  
20 rate over some period of time, that's correct.

21 Q Thank you. We do have some translation  
22 problems -- not problems, but there's a lot of  
23 talk in acre-feet and a lot of talk in cfs at  
24 various times. If I'm using the wrong thing,  
25 either volume or flow, let me know. All right?

1           We can also agree because you have a  
2 big chart in your report outlining the flows at  
3 the Miles City gauge, do you not?

4           A       Yes.

5           Q       So we can agree if you look at that  
6 chart there's always some water flowing past the  
7 gauge in Miles City, isn't there?

8           A       Typically there is, yes.

9           Q       All right. And you did not, as far as  
10 I know, attempt to assess how much of that flow  
11 was made up of amounts getting past the T&Y Canal  
12 and how much this is made up from return flows  
13 from irrigation along the T&Y Canal?

14          A       That's correct.

15          Q       How long is the T&Y Canal?

16          A       I don't recall exactly. Maybe on the  
17 order of 20 miles.

18          Q       Have you gone up and down it from its  
19 beginning to its end?

20          A       Yes.

21          Q       You have. Have you viewed the -- so  
22 you viewed the canal along its length?

23          A       Parts of it.

24          Q       Parts of it. Did you go down to the  
25 very end?

1           A           I don't believe I was clear down to the  
2 end, no.

3           Q           Do you know if there's a measuring  
4 device at the end of the T&Y Canal that measures  
5 tail water?

6           A           I don't know that, no.

7           Q           Did you ever attempt to assess how much  
8 tail water there was coming out of the T&Y Canal  
9 unused at any given point in time?

10          A           No.

11          Q           Are you aware of anybody who has done  
12 such an analysis?

13          A           I'm certain that the manager of the T&Y  
14 Canal probably is aware of what runs out the end  
15 of the ditch from time to time. I'm not aware of  
16 a specific quantification that may exist  
17 documenting that.

18          Q           Okay. Let's talk about your flow model.

19          A           Okay.

20          Q           And to do that I want to look at  
21 Appendix A in your original report. And I'm  
22 going to flip back between your original report  
23 and rebuttal report at times. I apologize for  
24 making you flip papers. Given this is an  
25 accumulation of your opinions, these two reports,

1 we kind of have to flip back and forth.

2 Now, if we look at Appendix A to your  
3 original report, that is a series of maps  
4 depicting sections of the Tongue River between  
5 the stateline and the T&Y Canal, right?

6 A Yes, that's correct.

7 Q And there are a couple of different --  
8 well, there's a key. How's that? One of the  
9 things that the key shows is irrigated lands in  
10 2009 and that's represented in green, correct?

11 A Yes.

12 Q And in addition there are these  
13 stippled areas identified, which is little dots,  
14 stippled areas identified on the maps which show  
15 the pre-1950 irrigated acreage as found in the  
16 county surveys that you referenced, right?

17 A Yes. This is based on the GIS coverage  
18 that's available at the state website on the  
19 survey mapping.

20 Q And the folks that did the surveys back  
21 in the '40s actually did field work to create  
22 their survey, right?

23 A Yes.

24 Q And a those surveys included both  
25 irrigated and irrigable lands, right?

1           A           Yes.

2           Q           And you list as part of your  
3 assumptions on page 10 of your report that the  
4 pre-1950 acreage reported was as reported in the  
5 county surveys. So you took their information,  
6 stuck it on your map in Appendix A, right?

7           A           You should probably distinguish between  
8 the number of acres that they tabulated, which I  
9 used for the demand calculation, and the  
10 information that I presented on these maps, which  
11 is the GIS coverage of where the lands were  
12 located at the time. Those are two distinct  
13 pieces of information for my purposes.

14          Q           All right. So there is the amount that  
15 they found, one piece of information, and then  
16 there is the location of those areas on the map,  
17 different piece of information, right?

18          A           Yes.

19          Q           And if I understand your demand model  
20 right, you didn't reduce the acreage in the  
21 county surveys in creating your assessment of  
22 calculated demand, correct? You used the  
23 acreage provided by the county survey.

24          A           I did, yes, that's correct.

25          Q           Fair enough. And the green areas,

1 again, represent areas that were actually  
2 irrigated in 2009 based on aerial photos?

3 A Yes.

4 Q All right. And we can agree that the  
5 green areas and the stippled areas don't always  
6 match up?

7 A That's correct.

8 Q And if we look at page 12 on Appendix

9 A --

10 SPECIAL MASTER: Which page?

11 Q Page 12, Appendix A. It is page 79 of  
12 Mr. Book's original report.

13 Got her?

14 A Yes.

15 Q All right. Page 12 on Appendix A shows  
16 stippled areas, the lands identified by the  
17 county surveys as irrigated or irrigable, correct?

18 A Yes.

19 Q And, yet, no post -- no actual  
20 irrigation in 2009 based on aerial photos, correct?

21 A That's correct.

22 Q Your model assumes demand for these  
23 lands, correct?

24 A No.

25 Q Stippled areas?

1           A           The analysis is based on an acreage  
2 amount, it's not based on specific locations of  
3 in the survey.

4           Q           So you totaled up the total and that is  
5 your calculation of demand on us, and you didn't  
6 take out any part of that acreage based on  
7 whether it was or was not irrigated in 2009?

8           A           That's correct, I did not.

9           Q           There's no reduction in your  
10 calculation of demand based on actual irrigation.  
11 That's not even what you're looking at, is it?

12          A           For the analysis that I submitted in  
13 January, that's correct. The purpose of the  
14 rebuttal analysis was to document the actual  
15 location of pre-1950 rights in Montana, which is  
16 what I did.

17          Q           That's an interesting point. I can't  
18 find in your rebuttal report where you changed  
19 your calculation of demand based on the acres in  
20 the rebuttal report. Can you help me with that?

21          A           I did not make that change.

22          Q           Okay. And I think we agree that your  
23 calculated demand is an average direct flow  
24 demand over the period from 1987 through 2007.  
25 That's a silly question. I don't want you to



1 answer that. I asked you in your deposition.  
2 You said yes. And I thought I understood it at  
3 the time, but I can tell that I don't now. Which  
4 is not unusual.

5 All right. Now, Appendix A again, is  
6 it safe to assume that some of the green areas  
7 identified all up and down Appendix A, that  
8 aren't stippled, represent lands irrigated under  
9 post 1950 rights in Montana?

10 A Yes, that's possible.

11 Q All right. And in fact in Appendix A  
12 to your rebuttal report -- you can look at that  
13 if you want -- you have differentiated for us  
14 lands irrigated under pre-'50 rights and land  
15 irrigated under post '50 rights, correct?

16 A Yes.

17 Q So if we look at the tan or yellow  
18 coloring in Appendix A in your rebuttal report,  
19 that shows land irrigated under pre-'50, and if  
20 we look at the green it shows land irrigated  
21 under post '50, right?

22 A Yes.

23 Q And there are thousands of acres  
24 represented by the green areas in Appendix A?

25 A It would be the difference between the

1 total acreage and the irrigated acreage on the  
2 2009 photos that I discussed this morning that  
3 would be several thousands of acres, yes.

4 Q Several thousands of acres?

5 A Was your question related to the post  
6 1950?

7 Q Post.

8 A Yes.

9 Q Now, with regard to the flow rate you  
10 used in your calculation of demand for the areas  
11 upstream of the T&Y Canal, you used a duty of  
12 water, and for the type canal you used the flow  
13 rates set forth in its water right of 187.5,  
14 correct?

15 A Yes.

16 Q And your assessment of the demand that  
17 we see reflected in your report assumes that  
18 these rights divert at these particular flow  
19 rates continuously during July and August?

20 A I don't think I would characterize it  
21 as they will be diverted continuously. As I  
22 recognized in my rebuttal report, the issue of  
23 variability diversions is real, and Mr. Hinckley  
24 pointed that out, and I agreed with the general  
25 concept, the purpose of the analysis is to assess

1 the necessary flow in the river when the demand  
2 is at its water right level.

3 Q So your numbers for each of those  
4 months reflect the demand if everybody with a  
5 water right used flow up to the flow rate set  
6 forth in their water right?

7 A Yes.

8 Q Well, let's take a real world example  
9 and sort of work through that and see how well  
10 that calculation holds up as compared to reality.  
11 All right?

12 Now, we can agree Tongue River  
13 Reservoir filled in 2005, right?

14 A Yes.

15 Q And Montana didn't make a call in 2005,  
16 there's no claim in this litigation of that. Are  
17 you aware of that?

18 A I'm not aware of that.

19 Q Take my word for it. And do you  
20 understand that there was a USGS gauge just  
21 above the T&Y Canal in 2005?

22 A Are you referring to the Decker gauge?

23 Q No, I'm referring to a gauge just above  
24 the T&Y Canal.

25 A I'm not sure that I've looked at the

1 data for that gauge. It's possible.

2 Q All right. Well, I'll represent to you  
3 there was a gauge upstream of the T&Y Canal, but  
4 not by very much, in 2005, established by the  
5 United States Geological Survey. And in July  
6 2005 there was 556 cfs of water flowing past that  
7 gauge. That water was available to the T&Y  
8 Canal. And in August there was 301 cfs on  
9 average flowing past that gauge that was  
10 available for diversion at the T&Y Canal. Just  
11 take that as a hypothetical. All right?

12 And we agree that both of those  
13 amounts, 301 and 556, are more than enough to  
14 satisfy the T&Y Canal's documented right to  
15 187.5, correct?

16 A Yes.

17 Q And the T&Y Canal has the ability to  
18 take 187.5 physically, does it not?

19 A Yes.

20 Q Now, let's look at the Appendix E-10 in  
21 your original report.

22 A Yes, I have that.

23 Q And that Appendix shows the diversions  
24 at the T&Y Canal for the period between 1997 and  
25 2005, correct?

1 A Yes.

2 Q If we look at 2005 in July, we see that  
3 the T&Y Canal diverted 9,051 acre-feet of water  
4 during that month, correct?

5 A Yes.

6 Q And if we convert 9,051 acre-feet into  
7 a flow, what do we get? I get 147, if that  
8 helps.

9 A That sounds about right, yes.

10 Q Okay. And then look at August on E-10.  
11 August, the T&Y Canal diverted 10,124 acre-feet  
12 of water, correct?

13 A Yes.

14 Q And if we convert that figure into a  
15 flow rate of cfs, I get 165. Does that sound  
16 about right?

17 A Yes.

18 Q All right. And we can agree that both  
19 147 and 165 are below 187.5?

20 A Yes.

21 Q So your model predicts that in the  
22 months of July and August the T&Y Canal might  
23 take 187.5, but in reality when there was more  
24 than adequate water, they took less than that,  
25 didn't they?

1           A           At least on a monthly average. This is  
2 not the daily data, but it's simply a total over  
3 a 30-day period.

4           Q           So here's the bottom line for me with  
5 regard to your flow model. It's not designed to  
6 calculate actual demand at any given point in  
7 time, right?

8           A           In my opinion, it does calculate the  
9 actual demand at points in time when the need for  
10 water is critical in the system. And those  
11 points in time do occur when the weather  
12 conditions are right and the demand for  
13 irrigation is right, based on sequencing of  
14 harvesting activities and weather conditions. So  
15 those times do occur.

16          Q           But we can agree that there is a  
17 variation in irrigation practices every year,  
18 right?

19          A           Yes.

20          Q           And at any given point in time some  
21 farmers may be haying, some farmers may be  
22 irrigating, some farmers may have chosen not to  
23 irrigate a certain field in a given year,  
24 correct? In fact, you got a table in your  
25 rebuttal report that shows a wide variation in

1 irrigated acreage, doesn't it, between the years  
2 2005, 2009, and 2011?

3 A There is a variation. I don't know  
4 that I would characterize it as wide.

5 Q But we agree that variation occurs.  
6 And our assessment of it is not terribly  
7 relevant. Variation does occur, right?

8 A Yes.

9 Q Okay. Your calculation of demand  
10 doesn't vary, does it? It's the same every year?

11 A Yeah, I did not attempt to do a  
12 volumetric, how much water would be diverted for  
13 year in and year out under varying crop demands  
14 and sequencing of harvesting activities.

15 Q It's the same every day, right?

16 A Yeah, I'm not representing that it  
17 occurs every day of a 30-day period.

18 Q But we know that the amount of water  
19 that farmers need on any given day is different  
20 day to day, year to year, and it depends on a  
21 wide variety of things, correct?

22 A I wouldn't go so far as to say it  
23 varies every day. What you will see are periods  
24 of time, multiple weeks at a time, where they are  
25 diverting at the maximum rate available to them

1 during the peak of the irrigation season.

2 Q Did you -- one thing we could look at  
3 to make an assessment of what the demand is on  
4 any given system is when do reservoir releases  
5 start, right?

6 A Yes.

7 Q Because we believe that typically  
8 farmers try to hold on to their storage water  
9 until they really need it, right?

10 A Yes.

11 Q And we can agree that just looking at  
12 reservoir releases would be a more accurate  
13 predictor of demand at any given time than the  
14 calculation that you made in your flow model?

15 A I don't necessarily agree that the  
16 demand out of a reservoir is going to be  
17 equivalent to the use of a direct flow right. As  
18 you just mentioned, there's going to be an  
19 incentive to preserve storage that is not there  
20 for a direct flow right where you use it or lose  
21 it. So the tendency is to take direct flow water  
22 when it's available, and to hold off a little bit  
23 on storage because of the ability to preserve it  
24 and carry it forward.

25 Q All I'm asking is, is the reservoir



1 release a more accurate predictor of unmet demand  
2 than the model that you created? And I think  
3 you've agreed with me about this before.

4 A I think you're probably right. That  
5 could be.

6 Q Okay. Let's talk about return flows.  
7 Having said that I don't think your model is very  
8 accurate, now I have to criticize the minutia  
9 about it, all right?

10 We agree that the rate at which return  
11 flows occur affects your calculation of demand.

12 A Yes.

13 Q All right. The faster they return, the  
14 lower the demand because they become available  
15 for reuse earlier, right?

16 A Well, think I showed with my  
17 sensitivity analysis that the faster the return  
18 flows occur doesn't necessarily affect the end  
19 result of the calculation.

20 Q Well, let's just talk about the  
21 numbers. In your original report you calculated  
22 return flows on the Montana side of the line for  
23 purposes of your demand assessment to be about 4  
24 percent in the first month, right?

25 A Yes.

1 Q And in your rebuttal report you said,  
2 well, maybe it's 16 percent. You bumped it up to  
3 that 16 percent number looking at some additional  
4 information. Is that fair?

5 A That was not a revision to the  
6 analysis. It was a sensitivity run, if you  
7 assume that 50 percent of the land was gravity  
8 and one-third of the return flow from the gravity  
9 lands was occurring at as surface runoff in the  
10 current month, and that was about the 16 percent.  
11 So the numbers that you mentioned are what I used  
12 in the two analyses.

13 Q So we are still sticking with, so I  
14 understand the 4 percent in your original report,  
15 that's going to ultimately make it's way into  
16 your Table 5, assessment of which months do or  
17 don't have sufficient flow to meet your calculated  
18 demand, right?

19 A Yes.

20 Q And you just didn't change anything in  
21 the rebuttal. You explored it a little bit but  
22 didn't make any changes, right?

23 A Yes.

24 Q All right. And you're saying the  
25 difference between 4 percent and 16 percent

1 doesn't change the ultimate outcome on Table 5  
2 very much?

3 A That's correct.

4 Q Okay. Of course, it could be both your  
5 numbers are wrong, that's why it doesn't change  
6 your table, right? Come on.

7 All right. Now, are you aware of the  
8 modeling study done on the Tongue River, or done  
9 for the Tongue River Reservoir, conducted by Geo  
10 Research which calculated return flows to be 31  
11 percent in the first month in Montana?

12 A I believe I'm aware of that analysis,  
13 yes.

14 Q It's not listed in any of your  
15 references in either report, though, is it?

16 A No.

17 Q What is the return flow that you  
18 applied in Wyoming for that part of your analysis?

19 A I don't recall the specific pattern. I  
20 obtained that from the Basin Plan report.

21 Q Was it something like 50 percent in the  
22 first month?

23 A I don't recall.

24 Q Now, the geo-research information isn't  
25 in your report, but one thing that you did

1 reference in your report is the 2002 Basin Plan  
2 that you just referred to, and that's joint  
3 Exhibit 58. You relied on that report, right?

4 A Yes.

5 Q I just want to ask you a couple little  
6 things about it. If I may approach.

7 SPECIAL MASTER: You may.

8 MR. KASTE: I don't think you're going  
9 to need a copy of this, but I have one for you,  
10 if you'd like.

11 SPECIAL MASTER: I'll take your word for  
12 it.

13 Q (By Mr. Kaste:) I've handed you joint  
14 Exhibit 58, Volume 1. This is the four or five  
15 volume document, and I just have some questions  
16 about the beginning. It gets really technical  
17 after the narrative portions that I can sort of  
18 understand.

19 So let's turn real quick to page or  
20 Chapter I, page 9. At the bottom is delineated  
21 as I-9. Roman Numeral I-9. I apologize you  
22 don't have a bound copy.

23 A I'm there.

24 Q All right. If we look down in the last  
25 paragraph upon the page, there's a sentence that

1 begins, to date there has been no interstate  
2 regulation. However, an unresolved issue before  
3 the commission, meaning the Yellowstone River  
4 Compact Commission, is how diversions in Wyoming  
5 and Montana would be regulated if there were ever  
6 a need for administration. Did I read that right?

7 A Yes, you did.

8 Q I don't understand any of your  
9 testimony to be an opinion one way or the other  
10 about when or whether Montana ever made a call.

11 A Could you repeat that?

12 Q You're not testifying about when or  
13 whether Montana ever made of a call on Wyoming.

14 A That's correct, I am not.

15 Q And this study was done in 2002,  
16 published in 2002, correct?

17 A Yes.

18 Q Okay. And it says, to date, there has  
19 been no interstate regulation. I read that  
20 right?

21 A Yes.

22 Q All right. Let's look at page --  
23 Chapter II, page 4. This is just a map of the  
24 entire basin. You might like to look at this.  
25 I'll put it up here.

1           SPECIAL MASTER: Could you adjust that  
2 on the screen a little bit?

3           Perfect. Thanks.

4           Q        (By Mr. Kaste:) This is just a map of  
5 the Tongue River Basin, right?

6           A        There is a map, the one I'm looking at  
7 is a map of the irrigated lands in both the  
8 Tongue and the Powder. Are you referring to  
9 Figure 2-1?

10          Q        Sure. And all I'm interested in, this  
11 is a general description of the irrigated lands  
12 in Wyoming in the Tongue River Basin and the  
13 Powder River Basin, correct?

14          A        Yes.

15          Q        Now, one of the things I understand  
16 from your report is that you didn't identify post  
17 '50 rights in Wyoming in the Goose Creek Basin,  
18 that you found depletions as a result of, right?

19          A        I identified the post 1950 rights in  
20 Appendix G in my report and the tabulation. The  
21 valuation I did related to storage up there. I  
22 did not do any direct flow depletion analysis on  
23 rights in either of these two basins, that's  
24 correct.

25          Q        So tell me if this looks about right to

1 you. That line differentiates the Tongue and the  
2 Powder? No? You go ahead and do it. Draw me  
3 a line that differentiates the Tongue and Powder  
4 River Basin with your finger.

5 A I believe Figure II-1 appears to be  
6 limited to the Tongue and Figure II-2 is the  
7 Powder Basin. So...

8 Q I thought this was just the Tongue.

9 A I'm sorry, you're correct. That  
10 happens to be Prairie Dog Creek out there to the  
11 east.

12 Q Here's what I want to get at. Watch my  
13 finger. Everything south of that line pretty  
14 much you didn't identify direct flow depletions  
15 in Wyoming that were harming Montana, right?

16 A With the possible exception of Prairie  
17 Dog Creek. They are on the east right now, your  
18 line crosses Prairie Dog Creek, and that line  
19 should go between Prairie Dog Creek and Goose  
20 Creek Basin. If that was -- if that line was  
21 drawn between Prairie Dog and Goose Creek, that  
22 would be a correct statement.

23 Q Well, we are going to look at another  
24 map in a minute and most of your concerns about  
25 specific parcels in Prairie Dog Creek are pretty

1 far down. So if I move this line a little  
2 farther south, am I about right?

3 A I can't tell on this scale of the map  
4 right here exactly where that is in relation to  
5 my Prairie Dog Creek parcels.

6 Q Fair enough. Now, the same would be  
7 true with a couple of tributaries on the Tongue,  
8 right? Some of them you didn't identify any  
9 depletions on some of these tributaries. Is Wolf  
10 Creek one of them?

11 A As it relates to the direct flow post  
12 '50 for irrigation, yes, that's correct.

13 Q So that's a lot of irrigated acreage in  
14 Wyoming, and none of the depletions that you're  
15 describing occur in those areas, right?

16 A Well, the reservoir storage depletions  
17 do translate into use in these basins. So it's  
18 not correct to say none of the impacts that I'm  
19 evaluating occurs in Goose Creek, because the  
20 reservoir storage is primarily for irrigation.  
21 So you would need to differentiate between direct  
22 flow and storage.

23 Q And I am. I just want to make sure I  
24 understand, and that we agree, that the  
25 regulation that does occur from the hydrographer



1 commissioners in Wyoming in certain places does  
2 an adequate job of protecting pre-1950 rights in  
3 Wyoming and pre-1950 rights in Montana. I think  
4 you say that in your report in so many words.

5       A       Well, in the rebuttal report I come  
6 back in the four specific years when the  
7 reservoir did not fill and point out when  
8 regulation dates approximately occurred in each  
9 of the two subbasins, Goose Creek and Little  
10 Goose Creek. And some of those regulations --  
11 when regulation begins in a couple of those years  
12 is somewhat late after irrigation is started. So  
13 any post 1950 use in a year when the reservoir  
14 has not filled, to the extent the impacts are  
15 going to pass down through an unregulated reach  
16 of stream are going to impact the stateline.

17       Q       Let's look at Chapter III, page 63 in  
18 the Basin Plan.

19               SPECIAL MASTER: What was the page?

20               MR. KASTE: Chapter III, page 63.

21               THE WITNESS: I have that.

22       Q       (By Mr. Kaste:) All right. At the  
23 very top of the page I believe the Basin Plan  
24 Says the winter bypass flow at Tongue River Dam  
25 is based on an agreement between the State of

1 Montana and the Tongue River Water Users in the  
2 late 1930s to maintain adequate flow to keep the  
3 river free of ice and to allow for stock water  
4 use. Because this is not a formal water right,  
5 its validity under the Yellowstone River Compact  
6 is a matter of legal interpretation. Did I read  
7 that right?

8 A You read that correctly, yes.

9 Q All right. And you're not here to tell  
10 us, I think, or to express an opinion, about  
11 whether it was in some sense legally correct or  
12 legally wrong for Montana to bypass any given  
13 amount of water. In fact, your table simply  
14 reports the values that you found. You've given  
15 us the raw data and we have to make the legal  
16 determination, right?

17 A That's correct, yes.

18 Q All right. We are going to look at  
19 some of those values in a minute. Turn to  
20 Chapter IV, page 1.

21 A I have that.

22 Q All right. On Chapter IV, page 1, on  
23 the very bottom paragraph it's talking about a  
24 figure in the Basin Plan, called Figure 4-1. And  
25 what the narrative part says about that figure is

1 that it shows that the number of acres of forage  
2 crops harvested year varied from a low of about  
3 65,000 acres to a high of about 85,000 acres.

4 Did I read that right?

5 A Yes, you did.

6 Q So when they constructed the Basin  
7 Plan, they looked around and saw harvested acres  
8 can vary dramatically over given periods of time,  
9 right?

10 A Yes.

11 Q All right. But, again, and the point  
12 I'm trying to make, of course, your calculation  
13 of demand does not vary over any series of years,  
14 right? It doesn't.

15 A That's correct.

16 Q Let's turn, if you can, to the back,  
17 about this far back, to a discussion about the  
18 Columbus Creek drainage. I don't think it's  
19 consecutively paginated with the rest of the  
20 report. On my report it says page 39 at the  
21 bottom.

22 SPECIAL MASTER: Mr. Kaste, I've  
23 actually changed my mind. Could I have a copy  
24 the document?

25 MR. KASTE: Well, this is the last

1 thing we are going to talk about.

2 MR. DRAPER: What's the page number?

3 MR. KASTE: 39. Back of the first  
4 volume, there's a discussion, individual  
5 discussion, of the Columbus Creek drainage.

6 MR. DRAPER: Which chapter is it in?

7 Q (By Mr. Kaste:) Did you find it?

8 A I have it, yes.

9 Q In that section there's a heading that  
10 is entitled, Regulation. This is --

11 A Yes, I see that.

12 Q There is a discussion about the  
13 specifics of the Columbus Creek drainage in  
14 Wyoming for purposes of the Basin Plan, right?

15 A Yes.

16 Q And there's a sentence in here under  
17 that regulation says, Columbus Creek typically  
18 does not go under regulation. Return flows are  
19 enough to replenish creek flow to satisfy  
20 downstream demand even though the creek is  
21 entirely diverted at the Five-Mile Ditch. Did I  
22 read that right?

23 A Yes.

24 Q We agree, I assume, that return flows  
25 can play a very important role in satisfying a

1 host of rights throughout the course of any given  
2 river system?

3 A Yes. I don't think I would characterize  
4 the downstream water rights on Columbus Creek as  
5 a host of water rights. But in general concept,  
6 return flows are available for downstream diverters  
7 to the extent they exist.

8 Q And that's all I'm getting at is the  
9 general concept, Columbus Creek isn't one of the  
10 ones you found depletions on that made its way  
11 into your calculation of depletions, right?

12 A This one is referring specifically to  
13 the Wagner and Five-Mile Reservoir that we were  
14 dealing with. So...

15 Q Fine. It's in there. Great. I'm  
16 asking you about the general principle, return  
17 flows are important. And it would be important,  
18 don't you agree, to account for those if you  
19 wanted to know what was going on in any given  
20 river system?

21 A Yes.

22 Q All right. Let's talk about the  
23 reservoir. Special Master asked you a question  
24 about Figure 6 in your original report.

25 A Yes, I recall that.

1 Q Okay. And this chart, or this figure  
2 shows winter reservoir outflow versus stateline  
3 flow comparing pre-1950 to the period between  
4 2000 and 2006, right?

5 A Yes.

6 Q Pre-1950 the reservoir was smaller, was  
7 it not?

8 A Yes.

9 Q Would that maybe provide a good  
10 explanation why more water passed through it in  
11 any given year? It didn't have the capacity to  
12 store more.

13 A No, I don't believe so, because the  
14 reservoir was being operated in the wintertime  
15 such that it was passing most of the flow. So  
16 the amount of total storage capacity was not  
17 impacting the amount of storage during these  
18 particular months.

19 Q All right. Let's look at page 9 of  
20 your report real quick.

21 SPECIAL MASTER: January report?

22 MR. KASTE: Yes, sir.

23 Q (By Mr. Kaste:) Okay.

24 A I have that.

25 Q I believe on page 9 of your report you

1 report, based on your investigations, that the  
2 reservoir pre-'50 was approximately 69,000  
3 acre-feet, right? In the first full paragraph.

4 A What I indicated there was what the  
5 maximum capacity that was obtained from the  
6 storage records that I published in my report,  
7 69,000.

8 Q Do you see a whole bunch of other  
9 records that mention the capacity of the  
10 reservoir prior to 1950 in the course of your  
11 work in this case?

12 A It's possible that there are some  
13 references to that in some of the documents.

14 Q Did you -- did any one of them jump out  
15 at you as being a whole lot different than 69,000  
16 acre-feet?

17 A I didn't evaluate that.

18 Q Just to give some perspective to the  
19 size of the reservoirs in Wyoming and in Montana,  
20 the capacity of the 11 Compact reservoirs, I  
21 think, in Wyoming, I think you report on page 3  
22 of your report as having a capacity of 23,744  
23 acre-feet; is that right?

24 A Yes.

25 Q So the Tongue River Reservoir is about

1 three times bigger than all the Compact  
2 reservoirs in Wyoming, right?

3 A Yes.

4 Q All right. With regard to the  
5 operations of the Tongue River Reservoir, you  
6 didn't make an attempt in the course of your work  
7 to quantify the downstream stock water rights  
8 that need to be satisfied in the winter, right?

9 A No, I did not.

10 Q All right. You did, however, calculate,  
11 and I think you reported on page 9 of your  
12 report, that the average winter outflows over the  
13 period between 2000 and 2006 was 124 cfs from  
14 that reservoir, right?

15 A Yes.

16 Q And, of course, I'm sure we agree 124  
17 cfs is not a minor amount of water.

18 A That's correct.

19 Q All right. And might be under certain  
20 circumstances, but 124 is not, right?

21 A Correct.

22 Q Are you going to regret the use of the  
23 word minor amount for the remainder of this trial?

24 A No, because it relates to the capacity  
25 of the canal, so it's about 5 percent of the canal



1 capacity.

2 Q Really? What's the capacity of the  
3 Tongue River?

4 A I don't believe the river has a  
5 capacity that's expressed.

6 Q River is bigger than the T&Y Canal most  
7 of the time, isn't it?

8 A That's possible, yes.

9 Q Possible?

10 All right. Now, when you made your  
11 assessment that the Tongue River Reservoir didn't  
12 fill in certain years, your original assessment,  
13 I think, is it fair to say, that you looked at  
14 the actual level of the reservoir to make that  
15 determination, you looked historically at where  
16 was the reservoir at its highest point, and  
17 determined that it hadn't filled in certain  
18 years, right.

19 A Yes, and that consideration also  
20 involves the carryover going into the year as well.

21 Q But it was really looking at what  
22 actually was done with the reservoir?

23 A Yes, in consideration of the carryover  
24 as well.

25 Q All right. And then in your rebuttal

1 report you considered what Mr. Hinckley had said,  
2 that he's got this all wrong because there's a  
3 45,000 acre-foot maximum winter carryover  
4 capacity that he didn't take into account, right?

5 A I described that as a constraint that's  
6 expressed in the operating manual, and it looks  
7 like it's a constraint that is applied over the  
8 winter through the month of March.

9 Q Okay. Well, cool. Let's look at the  
10 end-of-the-month content for the reservoir, Table  
11 4-A of your original report, page 30. So there's  
12 an operational constraint of 45,000 acre-feet  
13 over the course of the winter, right?

14 A Yes.

15 Q Okay. Let's look at October of 2006,  
16 starting the winter. Can you identify for me the  
17 contents of the reservoir at the end of the  
18 month, October 2006? I lied. No, I didn't. I  
19 want to start with 2006.

20 A Well, based on my understanding of your  
21 question, I would go to the end-of-month content  
22 on the 2005 row, which is --

23 Q I want to go to the next year. I want  
24 to start in 2006, for the 2007 water year.

25 A Yes, that number is 47,338.

1 Q And then in the next month, the winter  
2 month of November, what's the end-of-the-month  
3 content for the Tongue River Reservoir, November  
4 2007?

5 A 48,379.

6 Q December?

7 A 47,858.

8 Q January?

9 A 48,900.

10 Q February?

11 A 51,504.

12 Q March?

13 A 62,149.

14 Q Every single one of those was above  
15 45,000 feet, was it not?

16 A Yes.

17 Q Let's go to October the next year.  
18 What was the end-of-the-month content in October,  
19 2007?

20 A 50,983.

21 Q And November of 2008?

22 A 51,244.

23 Q December?

24 A 50,983.

25 Q January?

1 A 51,244.

2 Q February?

3 A 51,244.

4 Q And March?

5 A 51,808.

6 Q And, again, every single one of those  
7 is above 45,000 acre-feet, is it not?

8 A Yes.

9 Q And there is data out there for 2009  
10 through present, right? You don't have it in  
11 your report but it's out there, isn't it?

12 A That's correct.

13 Q Would you be surprised to learn that in  
14 every single winter month between the numbers you  
15 just read and today the reservoir has been above  
16 45,000 acre-feet except for three months in all  
17 of those years?

18 A No, that wouldn't surprise me.

19 Q Wouldn't surprise you?

20 A No.

21 Q So I think you said in the course of  
22 your testimony that established practice is  
23 something that Mr. Hinckley didn't take into  
24 consideration when he didn't apply the 45,000  
25 acre-foot maximum. Do I have that about right?

1           A           It's not just the established practice.  
2 It's the inclusion of a wintertime storage  
3 constraint in the operating manual. In other  
4 words, you don't have to just interpret an  
5 established practice, because you have guidance  
6 in the operations manual as to why and what the  
7 target is in the winter. So it's more than just  
8 practice?

9           Q           Here's my point: In practice since  
10 2006 there's more water in the reservoir than  
11 this maximum winter carryover capacity. So  
12 clearly it's not a real operational limitation.  
13 You can agree with that or not. I'm just telling  
14 you.

15          A           Yes, I'm aware that the managers of the  
16 reservoir have tried to look at increasing that  
17 level a little bit in the wintertime to get a  
18 little more water in the reservoir. And that's  
19 what's reflected in the records here.

20          Q           And you wouldn't be surprised to learn  
21 that that has continued through the present, that  
22 they are storing more water over the course of  
23 the winter and bypassing less, right?

24          A           These data that we just looked at don't  
25 necessarily imply storing more or bypassing less.

1 It was going into the winter with a higher  
2 content but still passing the water in the  
3 winter. A lot of these months that we just  
4 looked at, there was no accrued storage. All the  
5 inflows were bypassed. At least in '07 and '08.  
6 And it looks like '06 as well.

7 Q Let look at Table 4-E. These are the  
8 bypasses.

9 A Yes, I have that.

10 Q So this is water passed through the  
11 reservoir not stored, correct?

12 A Yes.

13 Q This is, from my point of view, water  
14 that was available for storage and yet bypassed.  
15 Do we agree that if they closed the gate, it  
16 would have stayed in the reservoir, right?

17 A I'm not agreeing with your point of  
18 view that it's water that could have been stored.  
19 But this is water that went through the reservoir.

20 Q Okay. As a matter of physics, if you  
21 shut the gate, would that water have been in the  
22 reservoir?

23 A Yes.

24 Q Okay. That's all I'm getting at.

25 All right. Let's look from October

1 2003 through May 2004. So the winter months  
2 preceding the irrigation season of 2004. Can you  
3 add up for me how many acre-feet of water passed  
4 through the dam from October, say, through April,  
5 before that 2004 irrigation season.

6 A It looks like approximately 42,000  
7 acre-feet if you take the months of October  
8 through March of 2004. Was that the period you  
9 were asking about?

10 Q Yes.

11 A 42,000.

12 Q What about October through March,  
13 October of 2005 through March 2006, what is the  
14 total of that?

15 A Again, for those same months,  
16 approximately 54,000 acre-feet.

17 Q If I understand right, your bottom line  
18 number for '04 on Table 3 of your rebuttal report  
19 is about 1900 acre-feet and your bottom line  
20 number in '06 in Table 3 of your rebuttal report  
21 is about 3,000 acre-feet?

22 A That's correct.

23 Q Look at Appendix B-10 from your report.  
24 SPECIAL MASTER: Which table again?

25 A I have that.

1 Q Appendix B-10 shows the monthly flow of  
2 the Tongue River at Miles City, Montana, for the  
3 years 2000 through 2011.

4 A Actually, the table is a two-page table  
5 and it begins with 1939. So you're looking at  
6 the second page, which starts at 2000.

7 Q Okay. Would you do me a favor and add  
8 the values for the Miles City flow in the year  
9 2004 between June and September. So basically  
10 the irrigation season.

11 A For those four months -- five months,  
12 sorry -- excuse me, four months, June through  
13 September of 2004 is approximately 10,000  
14 acre-feet.

15 Q What about in 2006, let's look at the  
16 values in the same months in 2006.

17 A It looks like approximately 9500  
18 acre-feet.

19 Q All right. So in the winter of these  
20 two years, preceding the irrigation season, there  
21 were bypasses at the dam in '04 of approximately  
22 42,000 acre-feet and '06 of approximately 54,000  
23 acre-feet. That's what happened during the  
24 winter in terms of bypasses, right?

25 A Yes.



1 Q And during the summer the amount of  
2 water that got into the Yellowstone River past  
3 the Miles City gauge was approximately 10,000  
4 acre-feet in each year?

5 A I guess the only comment I would make  
6 on those Miles City gauge flows, those are pretty  
7 low flows for those months. You just had me add  
8 up, if you compare those to the record. It  
9 looks like they had the river tightened down  
10 pretty tight in those years.

11 Q They are pretty low flows, 10,000  
12 acre-feet is a low flow?

13 A Monthly rates of flow for a couple of  
14 those months in those two years is what I would  
15 consider very low.

16 Q You're about to step right in that  
17 minor amount pile again. That's way more water  
18 -- well, three or four times as much water as we  
19 see in the bottom line of your Table 3 in your  
20 rebuttal report, isn't it? If we just look at it  
21 volumetrically, it's more water, isn't it?

22 A Yeah. I don't agree that's a  
23 reasonable comparison to make. But it's different.

24 MR. KASTE: All right. I can see that  
25 we are after the noon hour. I'm about to stop

1 and start talking to you about your assessment of  
2 post '50 use in Wyoming. So I think it's  
3 probably a good time to break, if that's all  
4 right with you?

5           SPECIAL MASTER: That sounds good to  
6 me. So why don't we break now and why don't we  
7 plan to come back at 1:15, which is cutting your  
8 one hour a little bit short, but we lost a little  
9 bit of time this morning.

10                   (Recess.)

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REPORTER'S CERTIFICATE

I, Richard L. Mattson, Certified Court Reporter, certify that the foregoing proceedings were reported by me in machine shorthand and thereafter reduced to typewriting via computer-aided transcription; and that it is a true and correct record of the proceedings herein.

I further certify that I am not attorney for, nor employed by, nor related to any of the parties or attorneys to this action, nor financially interested in the action.

IN WITNESS WHEREOF, I have set my hand and seal at Billings, Montana, this 30th day of December, 2013.

/s/ Richard L. Mattson

Richard L. Mattson  
Certified Court Reporter  
Notary Public for the  
State of Montana  
Residing at Billings

(Seal)