



2009.02.27 - Deposition of David Sunding

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Also Appearing: Dale Book, Scott Ross  
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James Williams, James Schneider

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1 E X H I B I T I N D E X

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1 MR. DRAPER: Let's address a couple  
2 of things first before we get into the  
3 deposition. One is, I understand, Mr. Wilmoth,  
4 that you are having delivered here this morning a  
5 hard drive with the electronic information that

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6 you had said you would provide us. I understand  
7 from Mr. Riley that it's more than 160 gigabytes  
8 on a hard drive and Mr. Riley and Mr. Book will  
9 take a quick look at it, but subject to any  
10 change in plans there, we'll simply borrow that  
11 hard drive temporarily and download the  
12 information and then send it back to wherever you  
13 direct.

14 MR. WILMOTH: That's fine. Send it  
15 back to my office and I'll see that it gets back  
16 to the owner.

17 MR. DRAPER: The other matter  
18 relates to Mr. Dunnigan's testimony. If you  
19 would state for the record what your intentions  
20 are with respect to his testimony.

21 MR. WILMOTH: Sure. Before we went  
22 on the record, what I mentioned to Mr. Draper was  
23 the fact that we intend to utilize Mr. Dunnigan  
24 as a fact witness in support or in response to  
25 any issues regarding the so-called compliance

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1 reports, other issues raised in the Kansas  
2 Compliance Report or the issues identified in the  
3 Nebraska Compliance Report, with the exception of  
4 any modeling, opinions or materials. And that if  
5 Mr. Dunnigan's presence is required for  
6 additional deposition, he can be made available  
7 this afternoon if Mr. Draper doesn't feel that  
8 he's had a full and fair opportunity to depose  
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9 him yet.

10 MR. DRAPER: Just to confirm, he'll  
11 be testifying as a nonexpert?

12 MR. WILMOTH: That is correct.

13 MR. DRAPER: And I understand and  
14 would like to confirm that he will be testifying  
15 in the areas that I inquired into yesterday and  
16 while you might ask the questions differently if  
17 you were presenting the testimony, we did address  
18 all the subject areas that you would plan to get  
19 into in his testimony?

20 MR. WILMOTH: I can't warrant that,  
21 John. I don't, without seeing the transcript --  
22 I'll tell you, I think generally you walked  
23 through the elements he would be involved in, but  
24 I don't want to represent or warrant to you that  
25 you've covered all the issues. That's a decision

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1 that I think is up to you all.

2 MR. BLANKENAU: And, frankly, when  
3 you -- what you want for responsive witness, it  
4 does depend somewhat on the nature of the  
5 affirmative testimony that's presented, so  
6 there's latitude or leeway there.

7 MR. DRAPER: But unless something  
8 new is introduced that hasn't been discussed in  
9 the reports and deposition testimony here, Mr.  
10 Dunnigan's testimony would be, just to the areas

11 2009.02.27 - Deposition of David Sunding  
12 of the responsive Nebraska reports on the, on  
13 compliance issues as identified in the reports,  
14 of course, excluding the expert aspect of those  
15 reports?

16 MR. WILMOTH: Or the Kansas report;  
17 correct.

18 MR. DRAPER: All right. We'll take  
19 that under advisement and let you know shortly.  
20 Thank you very much.

21  
22  
23  
24  
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DIRECT - SUNDING (Draper)

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1 DAVID SUNDING  
2 Of lawful age, being first  
3 duly cautioned and solemnly  
4 sworn as hereinafter certified,  
5 was examined and testified as  
6 follows:

7 DIRECT EXAMINATION

8 BY MR. DRAPER:

9 Q. Good morning, Professor Sunding.

10 A. Good morning.

11 Q. Please state your full name, for the  
12 record.

13 A. David Sunding. The last name is  
14 spelled S U N D I N G.

15 Q. And your professional address?  
16 Page 6

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14           A.    Department of Agricultural and  
15    Resource Economics, in 207 Giannini Hall, UC  
16    Berkeley, Berkeley, California 94720.

17                    (Deposition Exhibit Number 15 was  
18    marked for identification.)

19           Q.    I'll hand you a copy of your  
20    curriculum vitae which we've marked as Exhibit  
21    15.

22                    In terms of protocol, if I say Professor,  
23    Doctor, Mr., is any of those more preferable than  
24    any of the others?

25           A.    No, as you prefer.

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1           Q.    Well, Professor Sunding, what is your  
2    current position?

3           A.    I'm a professor in the Department of  
4    Agricultural and Resource Economics, and I also  
5    have a small percentage of my appointment as a  
6    cooperative extension specialist.

7           Q.    And that's at the University of  
8    California in Berkeley?

9           A.    Yes, it is.

10          Q.    And I see from your CV you've held  
11    that position since 2002 as professor?

12          A.    Yes.

13          Q.    I understand also from your CV that  
14    you're co-director and founder of the Berkeley  
15    Water Center. What is that center?

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16           A.    The Berkeley Water Center is a center  
17 that's operated jointly by the colleges of  
18 natural resources and engineering on the Berkeley  
19 campus and also the Lawrence Berkeley National  
20 Laboratory. It's a center that's established to  
21 initiate and support multi-disciplinary research  
22 projects in the area of water resources.

23           Q.    Now, what is the staffing of that  
24 center?

25           A.    We have -- at the faculty level we

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1    have two co-directors, myself and faculty member  
2    from civil engineering. We have an associate  
3    director from Lawrence Berkeley National Lab. We  
4    have a full-time executive director who's not a  
5    faculty member, she's a staff person, and then a  
6    full-time program assistant to her. In addition  
7    to that, we have an outside advisory board which  
8    is a volunteer, you know, a volunteer thing, and  
9    then an executive committee that's composed of a  
10   number of different administrators and faculty at  
11   the Berkeley campus.

12           I don't know if you consider it staffing or  
13   not, but we also fund the research of, gosh, I'll  
14   give you just an estimate, probably a dozen  
15   graduate students and post docs.

16           Q.    Where does the funding from that  
17   center come from? Is that a university-funded  
18   center?

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19           A.    The different colleges, so the  
20           engineering and natural resources and Lawrence  
21           Berkeley Lab each make a cash contribution that  
22           deans chip in to support some of the core  
23           operations of the center.  Then we have a set of  
24           industrial affiliates, companies like Bechtel,  
25           Schlumberger, Siemens.  Engineering firms like

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1           Malcolm Pirnie who all make cash contributions.  
2           And sometimes in-kind contributions in the form  
3           of donated equipment and the like.  Our main  
4           source of funding though is extramural research  
5           grants from the National Science Foundation, EPA,  
6           State of California, all the usual sources.

7           Q.    What percentage of your time do you  
8           spend on Berkeley Water Center activities?

9           A.    Gosh, a lot.  A lot.  You know, I  
10           laugh sometimes that I kind of got into  
11           administration without really realizing that's  
12           what I was doing.  But, you know, it depends on  
13           the week, but I would say on average it probably  
14           realistically is a half-time commitment.  It's a  
15           lot.

16           Q.    Plus you teach courses?

17           A.    Yes, I do.

18           Q.    And you've listed your courses on  
19           page 2 of your CV?

20           A.    Yes.  These are all the courses that

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21 I taught over my career.

22 Q. What courses are you currently  
23 teaching?

24 A. The very top course, risk technology  
25 in the environment and then the undergraduate

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1 course in natural resource economics. Those are  
2 the two that I taught in the fall.

3 Q. Turning to page 5 of your CV, that's  
4 where your list of publications begin.

5 A. Yes.

6 Q. Would you take a look at that with an  
7 eye to identifying publications on this list that  
8 deal with the same kind of issues that you've  
9 been dealing with on this current project for the  
10 state of Nebraska?

11 A. Sure. Can I mark this copy?

12 Q. Yes. That's a copy you can keep if  
13 you care to.

14 A. Okay. I apologize, I don't have  
15 these numbered, so we'll have to be careful about  
16 how we keep track of things.

17 Q. At least the pages are numbered and  
18 that's more than I often see.

19 A. Sure. Okay. The paper on Management  
20 of Saline Wastewater Discharges, that's actually  
21 a report.

22 Q. That's on the third from the bottom  
23 on page 5?

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24 A. Yes. That deals with -- one of the  
25 features in the report is agricultural water use

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1 and the plant response to changes in quality of  
2 irrigation water.

3 Q. That's -- is that on page 6?

4 A. It's on page 5, the fourth one down.  
5 It begins Management of Saline Wastewater  
6 Discharges.

7 Q. The same one you were referring to?

8 A. Yes, sure. At the top of page 6, the  
9 first paper deals with agricultural water demand.  
10 The paper on Joint Estimation of Technology  
11 Adoption in the American Journal of Agricultural  
12 Economics. The paper on Factor Price Risk. We  
13 don't -- we don't know too much about groundwater  
14 yet, but potentially the optimal management of  
15 groundwater paper could come into play.

16 The paper on Measuring the Costs of  
17 Reallocating Water From Agriculture on page 7,  
18 the fourth one down. I think the paper on  
19 Emerging Markets in Water in the Natural  
20 Resources Journal. Going further down the page,  
21 the third one from the bottom on The Agricultural  
22 Innovation Process. Page 8, the paper in the  
23 Journal of Soil and Water Conservation on Using  
24 Water Markets.

25 Q. The third one down?

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1           A.    Yes, sir.  The fourth one down, The  
2   Price of Water deals with agricultural water use.  
3   The next one down on Designing Environmental  
4   Regulations in Resource and Energy Economics,  
5   that also deals with agricultural water use and  
6   variations in environmental quality.  The paper  
7   Reallocating Water From Agriculture in the Review  
8   of Agricultural Economics.  The second from the  
9   bottom, the paper on Land Allocation, Soil  
10  Quality and the Demand for Irrigation Technology  
11  in the Journal of Agricultural on Resource  
12  Economics.

13           Moving to page 9, the first paper on  
14  Modeling the Impacts of Reducing Agricultural  
15  Water Supplies.  The third one down, Changes in  
16  Irrigation Technology and the Impact of Reducing  
17  Agricultural Water Supplies in Advances in  
18  Economics of Environmental Resources.  The paper  
19  in the American Journal of Agricultural Economics  
20  on Explaining Irrigation Technology Choices.  The  
21  next one down on How Does Water Price Affect  
22  Irrigation Technology Adoption.  The fourth from  
23  the bottom, Water Markets and the Cost of  
24  Improving Water Quality.  The second from the  
25  bottom, Water For California Agriculture: Lessons

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1 from the Drought and New Water Market Reform also  
2 deals with agricultural water use and that  
3 appeared in Choices. For the peer review  
4 publications, I think those are the ones most  
5 relevant. Shall we go through the technical  
6 reports, too?

7 Q. Yes, if you would.

8 A. All right. The first paper on  
9 Economic Impacts of Flow Requirements deals  
10 largely with agricultural water use. The third  
11 from the bottom on Water Allocation and Water  
12 Market Activity in California. On page 11, the  
13 fifth one down, Water Pricing and Water Use  
14 Efficiency was a monograph that I did for the  
15 Bureau of Reclamation. The Proposal For  
16 Management of the Confined Aquifer in the Western  
17 San Joaquin Valley with David Purkey in July of  
18 2000. Economic Valuation of Increased Water  
19 Supply Reliability and Trading Opportunities in  
20 Westside Agriculture in 1999. The bottom one, An  
21 Environmentally Optimal Alternative for the San  
22 Francisco Bay-Delta.

23 On page 12, the top, Water Trading and  
24 Environmental Quality in the Western United  
25 States. The fourth one down, Economic Incentives

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1 for improving Water Quality in Nevada's Truckee

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2 River Basin. Fifth one down on Managing Seawater  
3 Intrusion in Monterey County Through Agriculture  
4 Water Conservation. The next one down,  
5 Conclusions and Recommendations on a Framework  
6 for Comparative cost Effectiveness. The next one  
7 down, Economic Impacts of Water Rights, Fish and  
8 Wildlife Services, Water Rights Acquisition  
9 Program For Lahontan Valley Wetlands.

10 The next one down, Market Implementation of  
11 Bay-Delta Water Quality Standards. These all  
12 deal with economics of agricultural water use.  
13 The fourth from the bottom, Water Quality  
14 Regulation in the San Francisco Bay and Delta.  
15 And I think that's it.

16 Q. On page 13 there's a list of papers  
17 under review. Are any of those dealing with  
18 subjects that you consider to be similar to the  
19 ones you're dealing with here?

20 A. Yes, the top two both deal with  
21 agricultural water use.

22 Q. You have a list also of working  
23 papers. What do you mean by "working papers"?

24 A. Papers that I'm working on at the  
25 moment. They haven't yet been submitted to a

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1 journal. They're just in the process of being  
2 written.

3 Q. Okay.

4 A. So they're all at various stages of  
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5 being done.

6 Q. Are there any of those, the list that  
7 ends at the bottom of the page, page 13, any of  
8 those dealing with similar subjects?

9 A. The paper on water savings from  
10 adoption of precision technology deals with the  
11 subject of agricultural water use. It's I think  
12 marginally relevant to what we're talking about  
13 here.

14 Q. That's the fourth one from the  
15 bottom?

16 A. Yes, that's correct. I think that  
17 would be the only one.

18 Q. I see on page 22 you have a listing  
19 of legislative and administrative testimony.

20 A. Yes.

21 Q. Did any of those matters relate to  
22 the subjects you're addressing in your work for  
23 the State of Nebraska?

24 A. On the top of page 23, Economic  
25 Impacts of Reduced Water Supplies on Westside

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1 Agriculture, and then the next one, Economic  
2 Impacts of the Central Valley Project Improvement  
3 Act deals with economic cost of reductions in  
4 agricultural water supplies. The testimony I  
5 gave in the Waiahole Ditch case, the fourth from  
6 the bottom, Economic Impacts on Leeward

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7 Agriculture, that I think is somewhat relevant to  
8 what we're talking about here, because that was  
9 also a bad agricultural water use. The third one  
10 from the bottom, The Least-Cost Implementation of  
11 Bay-Delta Water Quality Standards. The one below  
12 that on The Potential For Agricultural Water  
13 Conservation and then the bottom one on Economic  
14 Impacts of the Central Valley Project Improvement  
15 Act.

16 Q. I was noticing one on the previous  
17 page, about the middle of the page, Economic  
18 Impacts of Drought-Induced Water Storage?

19 A. I'm sorry, I skipped over that. That  
20 didn't deal with agricultural water use at all.  
21 That was strictly municipal.

22 Q. Have you previously served as an  
23 expert witness?

24 A. Yes, I have.

25 Q. Has that been in administrative

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1 proceedings or in court proceedings or both?

2 A. Certainly in court proceedings.  
3 Administrative proceedings gives me pause a  
4 little bit. I'm just trying to think. I can't  
5 think of an administrative proceeding off the top  
6 of my head, unless you would consider an  
7 arbitration an administrative proceeding. I  
8 think the majority of what I have done has been  
9 in court proceedings.

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10 Q. How many court proceedings have you  
11 appeared in?

12 A. Do you mean in trial or in  
13 deposition?

14 Q. In either trial or deposition. Maybe  
15 start off with a ballpark.

16 A. I can't give you an exact, I only  
17 have this academic CV. Something in the range of  
18 like 10 to 15.

19 Q. Have those tended to be mostly in  
20 California?

21 A. Mostly, yes.

22 Q. Is this the first work you've done  
23 for the State of Nebraska?

24 A. Yes, it is.

25 Q. Have you provided expert testimony or

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19

1 consultation in other interstate proceedings?

2 A. Yes, I have.

3 Q. Could you list those for me, please?

4 A. Sure. The Quantification Settlement  
5 Agreement proceedings on the Colorado River. The  
6 matter that's occurring now between North  
7 Carolina and South Carolina on the Catawba River  
8 and another one that I don't think I'm at liberty  
9 to mention yet.

10 Q. Okay. The fact that you're  
11 consulting in that third situation is

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confidential?

13 A. Yes. But that also involves work for  
14 a state.

15 Q. Is that an interstate water matter?

16 A. Yes, sir, it is.

17 Q. Just so I understand. What is the,  
18 was it the quantitative settlement proceeding on  
19 the Colorado River, what was that?

20 A. Quantification Settlement Agreement.  
21 It's the agreement between the states that use  
22 water on the Colorado River. The proceedings  
23 that I was involved in, involve the lower basin  
24 states.

25 Q. When did that occur?

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1 A. Oh, gosh. I think I got involved in  
2 that, I want to say, in 2001. Somewhere in that  
3 time frame.

4 Q. And that lasted up until when?

5 A. Up until now.

6 Q. Still working?

7 A. Right. My grandchildren could be  
8 working on that the way these things go.

9 Q. Who was your client in that  
10 proceeding?

11 A. It was the San Diego County Water  
12 Authority.

13 Q. Who were the other parties to that  
14 settlement negotiation?

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15           A.    The parties -- I'm chuckling because  
16    like everybody under the sun.  The parties that  
17    were most closely involved with the specific  
18    matters I was working on were the parties within  
19    California that have a Colorado River allocation  
20    and that's the Metropolitan Water District of  
21    Southern California, Coachella Valley Water  
22    District, the Imperial Irrigation District and  
23    San Diego County Water Authority.

24           Q.    And has a final Quantification  
25    Settlement Agreement been reached in that matter?

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1           A.    Yes.  
2           Q.    When was that reached?  
3           A.    In 2003.  December of 2003.  
4           Q.    What's the subject matter of the  
5    continuing activity on that matter?  
6           A.    A couple of issues.  The largest one  
7    has been the economic impacts of the water  
8    transfer between the Imperial Irrigation District  
9    and San Diego County Water Authority.  Those two  
10   entities had a significant dispute about the  
11   magnitude of third-party impacts from the water  
12   transfer and that has since been settled.  
13           The other issue that I've been involved in  
14   is, is a very complicated pricing formula  
15   associated with the IID San Diego water transfer  
16   and there's some dispute ongoing about

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interpretation.

18 MR. WILMOTH: Clarify your acronym.

19 A. IID is Imperial Irrigation District.

20 Q. So there's disputes over the  
21 interpretation of the Quantification Settlement  
22 Agreement?

23 A. Well, I think I was referring  
24 specifically to the price that San Diego would  
25 pay the Imperial Irrigation District for the

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1 transferred water. I don't think it's fair to  
2 say that there's a dispute about the  
3 Quantification Settlement Agreement in the sense  
4 that anyone wants to take an off ramp. The water  
5 is being transferred. It's more a question of  
6 what terms.

7 Q. When were you contacted by the State  
8 of Nebraska for your current project here?

9 A. It was a few months ago. I want to  
10 say two or three months ago. I think that's  
11 correct. I didn't bring an exact date with me.

12 Q. What investigation have you  
13 undertaken to carry out your work on this  
14 project?

15 A. I put it into a couple of areas. The  
16 first has been to survey the available public  
17 information regarding agricultural water use in  
18 the Kansas Bostwick Irrigation District, and more  
19 generally in North Central Kansas. And that's

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20 involved a review of information provided by --  
21 or information compiled by the Bureau of  
22 Reclamation, KBID, Kansas Bostwick Irrigation  
23 District itself, on up to the USDA National  
24 Agricultural Statistics Service. So that was the  
25 first, the first task that I set to.

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23

1 Then once the Kansas report became  
2 available, by "Kansas report" I mean the report  
3 of the Kansas economists on damages, then I also  
4 spent some time reviewing that and forming  
5 opinions about whether or not it was an  
6 appropriate basis for damages.

7 Q. Did you visit North Central Kansas or  
8 the KBID project?

9 A. No, I have not.

10 Q. Did you visit any other part of the  
11 Republican River Basin?

12 A. No, I have not.

13 Q. I made a copy of the text of your  
14 report and there's a copy for you to review and  
15 you might take a look at the specific copy, this  
16 takes the first 21 pages of the report.

17 we'll mark this as Exhibit 16?

18 MR. WILMOTH: Do you have a copy of  
19 this in your possession.

20 THE WITNESS: Yes.

21 MR. WILMOTH: Is your copy colored.

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22 THE WITNESS: No. Is this a color  
23 copy?

24 MR. WILMOTH: It is not.  
25 (Deposition Exhibit Number 16 was

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1 marked for identification.)  
2 Q. This exhibit is a black and white  
3 copy. Is that the same as the original?  
4 A. Yes, it is.  
5 Q. And does it appear we've got the  
6 first 21 pages completely?  
7 A. Yes. Give me a minute and I'll  
8 double-check, but I'm sure this is complete. All  
9 right.  
10 Q. It checks out?  
11 A. Yes.  
12 Q. How did you understand your  
13 assignment that caused you to generate this  
14 report?  
15 A. I was asked to investigate the  
16 magnitude of damages experienced by Kansas as a  
17 result of Nebraska's alleged overuse of water in  
18 the years 2005 and 2006. I was also asked to  
19 investigate and, if possible, form an opinion  
20 about the approach proffered by Kansas to examine  
21 that same question.  
22 Q. And the investigation that you  
23 undertook consisted of the two steps you've  
24 mentioned. One was to survey the available  
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25 public information from the Bureau of

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25

1 Reclamation, KBID, USDA, NASS and then to review  
2 the Kansas report itself?

3 A. Yes. I would also augment that by  
4 saying that obviously I have a grasp of the  
5 economic literature on agricultural water use, so  
6 I also did some reviewing and some researching of  
7 the literature to see whether or not methods  
8 employed by Kansas had ever appeared in a peer  
9 review journal.

10 Q. Could you summarize to begin with  
11 what you felt were the most significant problems  
12 with the Kansas analysis?

13 A. Sure. I'd offer a couple. The  
14 analysis appears to rely heavily on what's known  
15 as the IPYsim model which is a model developed by  
16 some faculty members in the agricultural  
17 economics department at Kansas State. That  
18 model, in my opinion, is not being used for an  
19 appropriate purpose here. I think even the  
20 authors of that model would tell you, and  
21 certainly they've written that that model is  
22 intended to be used by farmers at a very micro  
23 level, at a field level or a farm level, and it's  
24 to be used for them to get some information about  
25 recommended input application. In particular

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1 given certain user inputted soil qualities and  
2 other environmental conditions, the model will  
3 spit out a recommendation about how much  
4 fertilizer to use and how much irrigation water  
5 to use and will indirectly calculate a profit  
6 level.

7 So it's a spreadsheet-based program that's  
8 intended to be used at a micro level and it's  
9 intended to give guidance to farmers about how  
10 much input to apply. It's not a policy analysis  
11 tool, it's not a predictive tool. And to my mind  
12 that's not appropriate. So that was the major  
13 deficiency I saw.

14 I also noticed a whole series of what I  
15 would characterize as ad hoc adjustments to data  
16 that went into the report that were done without  
17 really any justification at all. Maybe a little  
18 verbiage around it, but without much careful  
19 research, frankly. And all of those adjustments  
20 or, if you will, fudge factors have a material  
21 impact on the final results.

22 A third, as I wrote in the report, I think  
23 the technique used for calculating direct impacts  
24 is not really state of the art. It's commonly  
25 used, but I wouldn't characterize as state of the

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1 art. And I think the notion of indirect damages  
2 is not appropriate in this case, given the  
3 context.

4 I'll say as sort of a threshold comment  
5 related to all of those opinions, I haven't been  
6 provided with an actual electronic copy of the  
7 model that the Kansas economist used. So all I  
8 have to rely on are the words on the page. The  
9 calculations are complicated enough that just  
10 reading the report and downloading the IPYsim  
11 model off the Internet, which I've done, I can't  
12 recreate what they've done. So again, I'll put  
13 that out there as again just sort of a threshold  
14 comment. Once I get a copy of that model, I  
15 might, I might modify some of my opinions or add  
16 some new ones.

17 MR. DRAPER: Just for the record, we  
18 have agreed in this proceeding to provide  
19 underlying data, if requested. We have not been  
20 requested to provide that. Another comment for  
21 the record, as far as this arbitration proceeding  
22 is concerned, the expert reports have now been  
23 submitted and aren't subject to being  
24 supplemented and that kind of thing. At least  
25 that's how I understand the situation.

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1 MR. WILMOTH: For the record, we'll  
2 make that request now then, John.

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3 MR. DRAPER: Okay.

4 Q. In terms of a summary of the major  
5 problems that you saw, have we covered all of  
6 them at this point?

7 A. In terms of problems with the model,  
8 I think those are very general comments, and sort  
9 of -- if you think of my opinion as being like a  
10 pyramid. That would be sort of the top of the  
11 pyramid and there are supporting opinions and  
12 facts that I would draw on below that, that I'm  
13 sure we'll go into in our remaining time today,  
14 if you'd like. But I think that would be, that  
15 would be the couple of most important points that  
16 I would bring out about the Kansas analysis.

17 Q. Okay.

18 MR. DRAPER: Well, I think this is a  
19 good time for a short break, and as I mentioned  
20 earlier, if at any time you need a short break,  
21 just let me know.

22 THE WITNESS: I appreciate that.

23 (A short recess was taken.)

24 MR. WILMOTH: Mr. Draper, yesterday  
25 you requested some materials of Dr. Ahlfeld

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1 regarding some proofs, I believe is the word you  
2 utilized, and this is what we've received in  
3 response to that request and I'll give that to  
4 you now. My understanding is that that is  
5 essentially all of the remaining materials from  
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6 Dr. Ahlfeld, at least that I am aware of at this  
7 point. As you may recall Dr. Ahlfeld was going  
8 to go back and look for anything else, but I  
9 believe that satisfies your request.

10 MR. DRAPER: Okay. With this, you  
11 believe you have provided us all the underlying  
12 data and analysis that hasn't already been  
13 provided?

14 MR. WILMOTH: I believe that's  
15 correct, with the exception I mentioned.

16 MR. DRAPER: Okay. This is a six-  
17 page document, unnumbered pages, but it says at  
18 the top Proposed Method As an Average of Group  
19 Base Conditions.

20 MR. WILMOTH: For the record, so  
21 there's no confusion, we would go ahead now and  
22 clarify that we would request all underlying data  
23 not previously provided by Kansas in support of  
24 any of its experts' reports, including but not  
25 limited to the specific information we requested

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1 about the IPYsim runs.

2 MR. DRAPER: Okay.

3 BY MR. DRAPER:

4 Q. Dr. Sunding, let's pick up again with  
5 some of the subjects we were talking about before  
6 the break.

7 A. Sure.

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8 Q. The first item that you mentioned as  
9 among the most significant problems with the  
10 Kansas analysis in your view was the use of the  
11 IPYsim model. Now, what kind of model is that,  
12 in your opinion?

13 A. IPYsim is a model that is intended to  
14 provide recommendations to farmers about profit-  
15 maximizing combinations of inputs, including  
16 water and fertilizers, in particular. It  
17 operates -- it's an Excel spreadsheet. When you  
18 download it off the Internet, it has some  
19 formulas in particular cells. It relies  
20 extensively on what I would characterize, and I  
21 think what the authors would characterize as  
22 user-provided parameters. I guess I would  
23 characterize it this way: The way it's intended  
24 to be used is a farmer would have this model, put  
25 in inputs related to conditions that are specific

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1 to his or her farm, and then the model would spit  
2 out recommendations about input application. But  
3 it's not, it's not a predictive model in the  
4 sense that it's not based on market data. It's  
5 not a model that typically is used in policy  
6 analysis. It has a purpose, I just think not the  
7 purpose that is relevant to this proceeding.

8 Q. You think a model used in this  
9 proceeding should be a policy analysis model?

10 A. I think it should be a model that  
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11 applies at a large geographic scale, as opposed  
12 to a model that applies to the level of an  
13 individual farm, and I'll explain that a little  
14 bit.

15 Q. If you would, please.

16 A. As I mentioned earlier, one of the  
17 kinds of inputs that goes into IPYsim is a  
18 description of soil conditions that are  
19 particular for a given farm, or a given field,  
20 applied at that level. Well, clearly within  
21 KBID, not all farms have the same soils  
22 conditions.

23 Q. How did you reach that conclusion?

24 A. From looking at USDA information,  
25 USGS maps, soil quality maps. That's true of

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1 agriculture virtually every place in the United  
2 States that I've ever worked.

3 Q. Describe the variation that you found  
4 in the KBID area in soils.

5 A. I'm not sure I could sit here now --  
6 that's not in my report. I'm not sure I could  
7 sit here and cite you facts. I gave you some  
8 reference sources for that, but I couldn't sit  
9 here and cite you facts on, say, variations and  
10 soil carbon or other factors that would be  
11 relevant.

12 Q. Do you have any recollection of what

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13 caused you to raise the criticism? Was it just  
14 the general idea that obviously you can't assume  
15 that one farm has the same soil conditions, or  
16 was it something specific to KBID?

17 A. I think it's obvious. I think also  
18 that notion appears in the technical  
19 documentation that's available on the Internet  
20 from the authors of the KBID model. They make it  
21 very plain that this is a farm level model.

22 Q. Now, it's not clear to me. If you  
23 have a farm level model, maybe some can be  
24 extrapolated to cover regions and some can't.  
25 what's your feeling on that?

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1 A. I don't think an extrapolation can  
2 take place legitimately unless there's a lot more  
3 background research provided. I don't think the  
4 Kansas report refers to this point barely at all,  
5 or acknowledges it barely at all, even though  
6 it's clearly using a farm level model that is not  
7 intended to predict farmer behavior, but make  
8 recommendations to farmers about how they should  
9 be behaving, and there's a difference.

10 And the difference stems from two sources.  
11 The model can be wrong, the model could not be  
12 incorporating every factor that affects profit  
13 for a specific enterprise, and it can sometimes  
14 be the case that farmers aren't completely  
15 rational. There's another problem with the

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16 IPYsim model, too, that's relevant to this  
17 proceeding, which is that my understanding is  
18 that the underlying crop production function, so  
19 the relationship between output and input, crop  
20 output and water input or fertilizer input, that  
21 relationship which was taken from a fellow named  
22 Stone, I believe, was not even developed for  
23 North Central Kansas. That relationship, I  
24 believe, came from Western Kansas and then is  
25 scaled up or down by use of these, I would

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1 characterize as ad hoc procedures, to get numbers  
2 that correspond roughly to what's happening in  
3 North Central Kansas. And while that may be  
4 expedient, I don't think it's justified.

5 Q. How far could the Stone model be  
6 moved? You're saying that from Western Kansas to  
7 North Central Kansas is too far, how far could  
8 you move it? Could you move it a few miles or  
9 how do you tell whether you can move it at all?

10 A. I say we couldn't know without more  
11 research.

12 Q. So --

13 A. But let me say it this way: But I  
14 think the Kansas analysis is based on an  
15 assumption, that the IPYsim model is based on an  
16 assumption that does not appear to me to be  
17 tested. Which is that that production function

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18 can be moved a distance of several hundred miles  
19 to an area with different weather conditions,  
20 different soil conditions. It may be similar in  
21 some ways, but it may be different in important  
22 respects, too.

23 Q. And how would you go about  
24 determining whether it was appropriate to  
25 translate the model from Western Kansas to North

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1 Central Kansas?

2 A. Well, just for the record, that's not  
3 the approach I would take in determining lost  
4 profits from a water shortage. I would take an  
5 approach more similar to what I've done in my  
6 report.

7 Q. And how would you describe your  
8 approach?

9 A. My approach is based more on market  
10 observations, observations of how farmers and  
11 other market participants actually behave, as  
12 opposed to what I would characterize as largely a  
13 theoretical approach based on derived or  
14 constructed data, which is what I think the  
15 Kansas report does. Remember, we have  
16 observations on important economic variables  
17 before, during and after the 2005, 2006 period.

18 Q. What are the factors that you  
19 consider important that we have the information  
20 on?

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21 A. Well, the ones that I looked at in my  
22 report --

23 Q. And in general those --

24 A. Sorry, I was trying to finish. Let  
25 me have a drink of water. The ones I look at in

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1 my report --

2 MR. WILMOTH: Can we take a minute.

3 MR. DRAPER: Sure.

4 (An off-the-record discussion was  
5 held.)

6 THE WITNESS: Would you mind  
7 repeating my question?

8 (An off-the-record discussion was  
9 held.)

10 A. Were irrigated acreage in the KBID,  
11 yield, crop yield in KBID and more fundamentally  
12 the market price of irrigated versus nonirrigated  
13 land. Which I believe the authors of the Kansas  
14 report have provided information about as part of  
15 their university job. So I relied on their  
16 reports.

17 Q. Just to make sure that we're seeing  
18 things the same way. The IPYsim model is a model  
19 that you referred to as containing a crop  
20 production function?

21 A. Yes.

22 Q. And I would -- another way of saying

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23 that, I believe, is that it contains or is a crop  
24 yield response model?

25 A. Yes. It's a mathematical equation

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1 describing a relationship between inputs and  
2 output. Where output is defined in terms of  
3 yield per acre, and inputs -- they're different  
4 equations in the IPYsim model but there would be  
5 one equation describing the relationship, say,  
6 between application of irrigation water and crop  
7 output per acre and another one for nitrogen and  
8 so on.

9 Q. Just to make sure we don't lose your  
10 point on the translation of the crop production  
11 function, the IPYsim model from Western Kansas,  
12 if that's where it was developed for and its use  
13 in KBID. What is the test, in your opinion, of  
14 whether that use at KBID is appropriate to make  
15 with the IPYsim?

16 A. I think ultimately you test the  
17 coefficients of that crop production equation, or  
18 of the crop production equations to see if  
19 they're similar.

20 Q. And how would you go about doing  
21 that?

22 A. Well, I think that's largely a job  
23 for an agronomist. I think an economist can  
24 evaluate that, can use it in the context of, you  
25 know, a sim model like IPYsim, but I think that's

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1 largely a job for an agronomist.

2 Q. Now, another problem that you  
3 indicated you had with that IPYsim model use is  
4 that it was constructed for the purposes of  
5 single farm use and it was being used for a  
6 regional purpose.

7 A. Yes.

8 Q. And why would it be improper to take  
9 a farm scale model and aggregate the region that  
10 you're interested in, whether it's four farms or  
11 six or a hundred, what theoretically, to start  
12 with, what is the problem with that?

13 A. Well, I think the problem with that  
14 is ultimately profits per acre are not the same  
15 on every plot of land within a region the size of  
16 KBID. Some land has more inherent productivity  
17 than other land, and if farmers are making  
18 rational decisions, if they're profit maximizing,  
19 which I think is the assumption of the IPYsim  
20 model, then back to the problem at hand. In  
21 response to a water shortage, one would expect  
22 the least productive land to come out of  
23 production first. So if a model is based on sort  
24 of a generic average condition for a region, that  
25 may not represent the actual response to a water

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1 shortage.

2 Q. Does a regional model capture that  
3 better than that one can be adjusted on a farm  
4 level basis?

5 A. If it's done properly, yes.

6 Q. And it does it better than one that  
7 can be adjusted on a farm-by-farm basis, is that  
8 fair?

9 A. Yes. A regional model that's based  
10 on -- well, "regional model" is probably not the  
11 term that an economist would use for that.  
12 There's all kinds of regional models. A model  
13 that's based on observed data, observed behavior,  
14 as opposed to theoretical or recommended  
15 behavior, I think is in a position to capture  
16 response better.

17 Q. Let me make sure I'm tracking your  
18 thinking on this. If you have, if we say okay,  
19 we've got an IPYsim model that starts out on an  
20 individual farm and maybe our purpose is to do a  
21 certain neighborhood, say 10 farms.

22 A. Okay.

23 Q. That's kind of a paradigm of what  
24 we're talking about, and certain inputs are  
25 required for that to be applicable to an

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1 individual farm. If you, if you find the  
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2 appropriate translation of those inputs to cover  
3 and represent the neighborhood --

4 A. Okay.

5 Q. -- why doesn't that, why doesn't that  
6 use of the model give you appropriate results for  
7 that aggregation of, in our example, 10 farms?

8 A. I think even if this case were about  
9 four farms that were right next to each other,  
10 the IPYsim approach is not the appropriate method  
11 to calculate damages. The IPYsim model is  
12 telling you what the researcher recommends, or  
13 what the researcher thinks will maximize profit  
14 and that could be wrong for a couple of reasons,  
15 most likely because the model doesn't capture  
16 everything that actually determines profit for  
17 that farm. So you have a model  
18 mis-specification, that's very likely. Another  
19 possibility is that the farmer may be irrational  
20 or maximizing something that's more complicated  
21 than the researcher realizes.

22 The IPYsim model is based on a proposition  
23 that farmers will maximize accounting profit.  
24 That may or may not be true. There may be a  
25 number of farmers that do that. But they're

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1 farmers who behave in ways that may be rational  
2 to them, but are different or more complicated  
3 than what an economist can write down in a

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4 mathematical model.

5 Again, just to summarize, my basic problem  
6 with IPYsim, whether it's four farms or a  
7 thousand farms, is that it's a model that's  
8 intended to provide recommendations to farmers  
9 about how to behave. It's not a model that's  
10 intended to be used for policy analysis.

11 Q. So if I understand your point. The  
12 aggregation is not really the problem of one too  
13 many. It's the problem that you're starting with  
14 the wrong model to begin with?

15 A. I think those are -- they're both  
16 problems. I mean I think this is, this is not  
17 appropriate for several reasons. You know, one  
18 of them being it's not appropriate to use a model  
19 that's intended to make recommendations.

20 Q. That's your first point.

21 A. That's my first point. Then the  
22 second point would be that it does not appear to  
23 me that the Kansas economists have made much of  
24 an attempt to look at variations in soil quality  
25 or other environmental conditions across KBID.

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1 That is not apparent from their report.

2 Q. And did you --

3 A. And I would say, just to finish my  
4 point --

5 Q. Please.

6 A. -- is a third issue. I have a number  
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7 of questions about the appropriateness of the  
8 underlying crop production functions, equations  
9 describing the relationship between inputs and  
10 outputs. I can't find evidence that the Kansas  
11 economists have made sure that those functions  
12 apply to North Central Kansas, other than to  
13 apply, I think, these very ad hoc fudge factor  
14 type corrections to make the yields come out  
15 somewhere in the neighborhood of what's observed  
16 in North Central Kansas.

17 Q. Just offhand, it sounds to me like  
18 that's how you might adjust a crop production  
19 function. You might compare it to your local  
20 fields and if the model that has the correct  
21 general principles in it has the coefficients  
22 adjusted so that it meets the local conditions,  
23 that that might, theoretically, might be an  
24 appropriate way to approach the problem?

25 A. Well, I think -- I would agree with

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1 you insofar as if the model is predicting yields  
2 that aren't close to reality, that's an  
3 indication there's a problem. Now, the specific  
4 method by which the correction was done, which is  
5 essentially, as I understand it from reading the  
6 technical memoranda, and again, you know, I'll  
7 put a threshold comment in here, I haven't seen  
8 an electronic copy of the model. So until I see

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that, I can't make absolutely definitive  
10 conclusions about what they did. But what it  
11 appears they did is to make the yields come out  
12 something close to reality. Just proportionally  
13 adjusted all coefficients in the crop production  
14 function, up or down, and I think that's, that's  
15 entirely without justification.

16 It's rigged to produce a particular result.  
17 Mathematically, it will come out with the answer  
18 you want, but to scale that whole function, that  
19 whole curve or linear or quadratic function, each  
20 parameter up or down by the same factor, is I  
21 think without justification.

22 Q. Well, I'm catching up with all of you  
23 guys as far as some of the details of the  
24 economic situation. But in general, I mean we  
25 talk about rigging models in hydrologic

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1 situations, which actually is a pejorative way of  
2 talking about calibration. We have to calibrate  
3 models in order to make sure that one, we start  
4 out with the processes that are correct, in that  
5 case it might be physical processes, here it  
6 might be economic processes. And then you  
7 calibrate it to real world data, in that case it  
8 might be water levels and in this case it might  
9 be yields. How is that improper?

10 MR. WILMOTH: Could you repeat  
11 that, there was an awful lot of information

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12 there.

13 (The requested portion of the  
14 testimony was read back.)

15 A. The process that I was describing  
16 that appears to me was followed to develop IPYsim  
17 is guaranteed to produce a particular result,  
18 mathematically guaranteed. But that doesn't mean  
19 the way the coefficients were adjusted, to  
20 translate it from Western Kansas to North Central  
21 Kansas, or to make any other kind of adjustment  
22 that's necessary, doesn't mean that that specific  
23 correction is proper because those coefficients  
24 are representing a particular agronomic  
25 relationship between inputs and outputs. For

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1 Western Kansas it may be proper, I haven't, you  
2 know, I haven't, I haven't, you know, gone back  
3 and done a third decomposition of Stone's work.  
4 But just assume for argument's sake it's correct,  
5 you will have to do some calibration, but this  
6 specific procedure that was followed to make the  
7 model come out with a particular result, I think  
8 is without justification. It lacks an agronomic  
9 foundation.

10 Q. How do you know specifically that the  
11 adjustment that was made to adapt it to this area  
12 was wrong?

13 A. Well, again the first place I looked

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14 was the technical memoranda that accompanied the  
15 IPYsim model, or the crop budgets that are  
16 available on the Internet at the Kansas State  
17 website because that's where IPYsim resides. So  
18 to figure out exactly what they did or develop an  
19 opinion about what they did, I read the technical  
20 memoranda. And it indicates to me that the  
21 coefficients were all scaled up or down by the  
22 same percentage to get a particular mathematical  
23 result.

24 Q. Now, the mathematical result is  
25 yield; is that right?

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1 A. Yes. That the model produces this  
2 user-provided parameter of the target yield.

3 Q. And if that adjustments were made,  
4 let's say, to match local yields, what would be  
5 improper about that?

6 A. Just because it comes up with the  
7 answer you want doesn't mean the relationship  
8 between inputs and outputs is correct. All those  
9 coefficients in the quadratic equation between  
10 inputs and outputs have an agronomic meaning, and  
11 simply scaling each of them up or down by the  
12 same proportion, I think, again mathematically  
13 will produce a particular result. But unless  
14 it's tied to actual field conditions and real  
15 world data in that region, I don't think you can  
16 say it's legitimate.

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17 Q. So it's your thought that, say, with  
18 respect to the coefficients in the quadratic  
19 relationship that you need to go in and  
20 individually adjust each parameter based on local  
21 conditions that can be measured.

22 A. I think that would be ideal, yes.

23 Q. And there is a way of measuring what  
24 the coefficient of one of those constituent terms  
25 is in the marketplace?

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1 A. I believe that's what Stone did for  
2 Western Kansas, and what's being in IPYsim is a  
3 translation of that to a different region.

4 Q. And at least by implication, what  
5 you're saying is you would expect those  
6 coefficients in a new setting, let's say a few  
7 hundred miles away, to all have varied in  
8 different degrees and not necessarily in the same  
9 proportion?

10 A. I think it's possible and I think the  
11 analysis has to be done.

12 Q. Do you know what the target yield was  
13 that the model was calibrated to?

14 A. It's listed in the report, I believe.  
15 And again, I only know what was represented in  
16 the report. I don't know what was actually done.  
17 You know, I'm not making an implication that  
18 there's anything underhanded at all, it's just

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that I only know what's on the paper --

20 Q. Okay.

21 A. -- in the report. Table 10 on page  
22 17 of the Kansas report lists the trend yield and  
23 the yield goal and the model yield.

24 Q. I think we've talked, at least a good  
25 bit, about your first two points. One, problems

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1 with the IPYsim model and the series of ad hoc  
2 adjustments that you refer to; is that correct?

3 A. Yes. There are other ad hoc  
4 adjustments besides the ones that we've  
5 discussed.

6 Q. What are those?

7 A. Well, there's a series of statements  
8 in the report where certain input prices were  
9 adjusted up or down by certain percentages for  
10 irrigated or nonirrigated land and I didn't find  
11 any of that to be very fully explained. There's  
12 certain cases where input parameters were taken  
13 as averages over certain time periods, and it  
14 wasn't clear to me why those time periods were  
15 chosen. I think most of those assumptions relate  
16 to, at least some of them relate to input prices.  
17 But also yields, as I remember.

18 Q. Anything else in that area which you  
19 see as ad hoc adjustments?

20 A. I think those are the major points.

21 Q. Then the third point had to do with  
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22 the indirect impact analysis.

23 A. I'm sorry, just so I remember. When  
24 we're talking about first point, second point,  
25 third point, these were points in relation to

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1 what?

2 Q. These are the points that you gave me  
3 when I asked you to identify what you consider to  
4 be the most significant problems with the Kansas  
5 analysis.

6 A. All right. Yes. I'm tracking you  
7 now.

8 Q. Okay. The third of those was the  
9 subject of the indirect impact analysis, and I  
10 believe you said that it is a commonly-used  
11 analysis, but that the particular form that was  
12 used here was not state of the art and you didn't  
13 consider it appropriate?

14 A. Yes.

15 Q. Okay. Could you explain that more  
16 fully, please?

17 A. Sure. Well, there are a couple of  
18 points in there, so I can unpack it a little bit.  
19 Let's stick to what I think is the easiest point  
20 and that's with respect to the use of the IMPLAN  
21 framework for this purpose, and then we can also  
22 move on to the more general conceptual point  
23 about whether or not indirect damages result in a

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double accounting.

25 IMPLAN is an example of what economists

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1 refer to as an input/output model based on a  
2 social accounting matrix. And that's a, I think  
3 as I said, a common technique, but at this point  
4 sort of an old-fashioned technique for  
5 calculating the indirect impacts of some change  
6 in resource allocation. In this instance a  
7 change in water availability. IMPLAN, like all  
8 input/output models is based on a number of  
9 assumptions that may or may not correspond with  
10 reality.

11 Among those assumptions are that the  
12 technological relationship between inputs and  
13 outputs is fixed. That prices don't change. It  
14 also assumes an awful lot of knowledge about  
15 expenditure coefficients and flows of money  
16 around, in this case, a rural economy, which in  
17 my judgment is stretching the limits of the  
18 available data.

19 Q. You say the use of IMPLAN is a common  
20 technique, but it's kind of old fashioned at this  
21 point. Can you say more about that? What is  
22 the -- what is the new fashion in this area that  
23 perhaps in your view should have been used?

24 A. Sure. A newer technique is the use  
25 of what's known as computable general equilibrium

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1 models, which I think are based on a more  
2 sophisticated view of how the economy responds to  
3 changes in resource allocation.

4 Q. That's one of the new techniques.  
5 What are the others that come to mind?

6 A. That's the major, the major new one.

7 Q. And --

8 A. I would characterize it as the major  
9 alternative that's based on a more modern theory.

10 Q. When was this theory developed?

11 A. The theory behind computable general  
12 equilibrium models?

13 Q. Yes.

14 A. They were really developed extensive  
15 -- I mean the basic theory is, you know, back to  
16 Arrow and Debreu but the mechanics of computable  
17 general equilibrium models were really developed  
18 in the 1980s. Whereas, input and output modeling  
19 goes back to the 1930s.

20 Q. As I recall, Leontief got a Nobel  
21 Prize in connection with some of the secondary  
22 impact theory?

23 A. Yes.

24 Q. And that he founded the theory, at  
25 least, that the IMPLAN mechanics are based on.

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1 Is the, is this alternative theory also based on  
2 Leontief's work, or is it on a separate  
3 theoretical track?

4 A. I don't think it's based on work that  
5 Leontief would disagree with. The real  
6 intellectual grandfathers of computable  
7 equilibrium general modeling also won Nobel  
8 Prizes.

9 Q. Were they contemporaries of Leontief?

10 A. I don't remember everybody's age, but  
11 Arrow and Debreu are, for my money, the greatest  
12 economists of the 20th century.

13 Q. When were they active?

14 A. I think Debreu -- Arrow is still very  
15 active, he's quite elderly now but he's very  
16 active. And Debreu who is at Berkeley died a few  
17 years ago, but he was active really through the  
18 '80s, professionally active through the '80s.

19 Q. When did they develop the underlying  
20 theory for the computable general equilibrium  
21 model?

22 A. Oh, my gosh, I think that would have  
23 been, say, in the mid '60s, publication of the  
24 book called Theory of Value. But that, you know,  
25 the Theory of Value definitely is the theory of

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1 how economies respond or how markets clear to  
2 equate supply and demand. That, in all honesty,  
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3 is fairly far removed from the mechanics of the  
4 computable general equilibrium model, which as I  
5 said got developed more in the 1980s.

6 Q. And who developed the mechanics?

7 A. I don't know if you could point to  
8 one person. A lot of the work that I know of  
9 that got done in computable general equilibrium  
10 modeling is the World Bank.

11 Q. Have the, have the mechanics of  
12 computable general equilibrium models been  
13 accepted by the courts in any case that you're  
14 aware of?

15 A. I'm not aware of any instance. I'll  
16 tell you, honestly, indirect impacts don't  
17 usually come up in court cases. So this is an  
18 unusual situation in my experience.

19 Q. Have you dealt with indirect impacts  
20 yourself?

21 A. Yes, I have.

22 MR. WILMOTH: Can we take a quick  
23 break, John.

24 MR. DRAPER: Sure.

25 (A short recess was taken.)

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1 (The requested portion of the  
2 testimony was read back.)

3 Q. Would you please describe your work  
4 in the area of secondary impact?

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5 A. Sure. Where -- the subject matter  
6 where I dealt with it the most has been with  
7 respect to changes in agricultural water use.

8 Q. All right. What techniques have you  
9 relied on to quantify secondary impacts?

10 A. Well, just to be clear, I have not --  
11 I don't want to misrepresent what I've done. I  
12 have been part of research projects where one of  
13 the team members estimated secondary impacts. I  
14 don't typically use IMPLAN or any other model to  
15 estimate secondary impacts. I'm familiar with  
16 them, I'm familiar with how they're calculated,  
17 but say if I pointed you, you know, to a report  
18 that I participated in where someone -- or where  
19 secondary impacts were discussed, I wouldn't have  
20 had my finger on the button actually producing  
21 the results, but I was part of the team that  
22 produced them.

23 Q. Okay.

24 (Deposition Exhibit Number 17 was  
25 marked for identification.)

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1 Q. Exhibit 17 to the deposition is, I  
2 think, an example of what you're talking about.

3 A. Yes.

4 Q. Would you describe what this is?

5 A. Sure. This is a report that my firm  
6 did for the San Luis Delta Mendota Water  
7 Authority, which is a group of agricultural water

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8 contractors in California.

9 Q. What part of California is that in?

10 A. The San Joaquin Valley. They receive  
11 water from the Federal Central Valley Project.

12 Q. And who are the authors of this  
13 report?

14 A. I would have been one of the authors.  
15 Let me take a second and get familiar with this.

16 Q. Sure.

17 MR. WILMOTH: Do you have a date on  
18 this.

19 MR. DRAPER: I'm about to ask the  
20 good professor here when he's had a chance to  
21 look at it.

22 A. Okay. I've looked through it.

23 Q. What is the date of this report?

24 A. I can't give you an exact date. I  
25 think it would have been, I want to say last

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1 summer. It was recent for sure, because the  
2 reason I know that is, you know, we're referring  
3 here to water year 2008 right in the beginning.  
4 This was done in response to some very dramatic  
5 water cutbacks that occurred in California last  
6 year. Those happened last summer, so it would  
7 have been done somewhere around that time period.

8 Q. Since we're on the subject of  
9 secondary impacts, what was the -- what was the

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analysis of secondary impacts in this study?

11 A. I don't think there are. I don't  
12 think there is an analysis of secondary impacts  
13 here.

14 Q. Let me back up a second. When I  
15 asked you who the authors were with you on this,  
16 you asked to take a look at it. Did you  
17 determine who the other authors other than  
18 yourself are?

19 A. Sure. On page 12 appears a list of  
20 the authors, and it's myself and a fellow named  
21 David Mitchell, who is an agricultural economist  
22 who works in California.

23 Q. Is he at Berkeley, also?

24 A. No.

25 Q. He's a private consulting economist?

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1 A. Yes, he is.

2 Q. Okay. Then to the question of  
3 secondary impact. I was looking at footnote  
4 number 1 on page 3.

5 A. Okay.

6 Q. Do you see the reference to the  
7 secondary impact analysis on footnote 1?

8 A. Yes, I do.

9 Q. Does that refresh your recollection  
10 about that part of this study?

11 A. No, it doesn't -- okay, you're right.  
12 I'm sorry. Now that I look through this, I see

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13 there are some secondary impacts measured here,  
14 and that -- to the point I was making earlier,  
15 and this is a very good example of what I was  
16 talking about. David Mitchell's specialty is  
17 secondary impact analysis, so he would have been  
18 the one, you know, who had his finger on the  
19 button for that. So this was part of a project  
20 that I was associated with and my name is on the  
21 report, but David would have been primarily  
22 responsible for the IMPLAN model.

23 Q. And that's the model that was used to  
24 assess secondary impacts by this paper?

25 A. That's correct. That's correct.

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1 Q. And the results of the secondary  
2 impact analysis are actually shown on page 5,  
3 table 3; is that right?

4 A. Among other places, yes.

5 Q. Where else does that show up?

6 A. Table 2, right above it.

7 Q. Okay. Anywhere else?

8 A. I think that's it.

9 Q. Were those results part of the  
10 ultimate conclusions that you reached in this  
11 report?

12 A. Yes.

13 Q. So you relied on the IMPLAN analysis  
14 for the purposes of this report?

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15 A. For the purposes of this report, yes.

16 Q. What was the purpose of this report?

17 A. This was a policy study to give some  
18 rough sense of what the impacts of water shortage  
19 might be, short-term water shortage. So it was  
20 really to inform policymakers about the  
21 consequences of their actions.

22 Q. What were the elements of this study  
23 that you did?

24 A. Primarily the assessment of the  
25 direct impacts.

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1 Q. In other words, the --

2 A. And also just to finish.

3 Q. Yes.

4 A. Some of the more conceptual analysis  
5 related to groundwater.

6 Q. You said the purpose of this study  
7 was, or that it was a policy study. What do you  
8 mean by that?

9 A. It was an economic analysis of a  
10 policy decision, a particular cutback on water  
11 supplies that was implemented by the Bureau of  
12 Reclamation in California. So this was an  
13 economic assessment of that change in resource  
14 allocation.

15 Q. Who was it prepared for?

16 A. Again, it was prepared for the  
17 San Luis Delta Mendota Water Authority who were

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18 the federal contractors that export water out of  
19 the San Joaquin Delta.

20 Q. How were they going to use the  
21 report?

22 A. I don't know.

23 Q. If we look at this in relation to the  
24 present work that you're doing here, this seems  
25 to be an analysis of the economic impact of the

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1 water shortage?

2 A. Uh-huh.

3 Q. Can you describe the ways in which  
4 it's similar and perhaps dissimilar to the work  
5 that you're doing here in Nebraska?

6 A. Well, it's similar in that the  
7 underlying subject is the economic impacts, the  
8 change in water availability to agricultural  
9 water users. Having said that, obviously there  
10 are differences in agriculture between California  
11 and Kansas, which I don't think would surprise  
12 anybody here. In particular, the notion of  
13 nonirrigated production. Given the arid climate  
14 is California, it's just not something that is  
15 economically feasible. So there would be some  
16 differences in terms of, you know, the underlying  
17 nature of agricultural water use similarities  
18 too. This was a one-time shortage that had to do  
19 with very unusual weather conditions experienced

20 2009.02.27 - Deposition of David Sunding  
21 in California that year. So it was really a one  
22 off event and was unanticipated by both the  
23 government and farmers.

23 Q. How do you think that feature  
24 compares to the issue we're analyzing here?

25 A. Well, we're not looking at something

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1 that happened just one year. As I indicated  
2 earlier, I looked at both 2005 and 2006. So to  
3 that extent, the duration of this was less than  
4 what we're talking about in the present case.

5 Q. So one year versus two years?

6 A. Yes.

7 Q. Is that a significant difference, in  
8 your opinion?

9 A. It can be.

10 Q. But in this specific comparison, is  
11 it?

12 A. I think the kind of -- the underlying  
13 policy change that we were talking about in this  
14 report that we're referring to, it unfolded very  
15 quickly and it was very dramatic. You know, I  
16 certainly haven't experienced anything like that  
17 in California before. It was just a really,  
18 really, really unusual situation that had to do  
19 with a particular pattern of precipitation. So  
20 how generalizable it is, I wouldn't say it's  
21 terribly generalizable.

22 Q. What was the policy choice that you  
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23 were analyzing?

24 A. I suppose ultimately how much water  
25 to be provided on the Central Valley project.

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1 Q. Based on your report, a decision  
2 would be made as to how much water to provide to  
3 the project?

4 A. I didn't say that. I think I said I  
5 didn't know how our water user clients were  
6 intending to use this report. They asked an  
7 interesting and economically valid question and I  
8 felt like I was in a position to answer it.

9 Q. On that basis, a decision could be  
10 made as to how much to curtail water deliveries?

11 A. Yes.

12 Q. On the secondary impact question, you  
13 didn't insist that your co-author use a  
14 computable general equilibrium model?

15 A. No.

16 Q. Why not?

17 A. This was something that had to be  
18 done very quickly and for a very limited budget  
19 and it was also for the purposes of a policy  
20 analysis, you know, as opposed to a situation  
21 where money would be changing hands directly. So  
22 for quick -- I don't want to say quick and dirty,  
23 but for a quick turnaround policy analysis, given  
24 the way IMPLAN has been developed in California,

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25 I thought was acceptable.

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1 Q. Now, water supply conditions, water  
2 supply deliveries could be determined based on  
3 this report; right?

4 A. People can do anything they want with  
5 this. I can't control that.

6 Q. Right, but if someone goes without  
7 their water, that's also an economic event  
8 similar to money changing hands; isn't that  
9 right?

10 A. It can have profit implications, yes,  
11 I would agree with that.

12 Q. In this study did you use a monthly  
13 economic agricultural production model?

14 A. No -- yes, I'm sorry, we did, yes.  
15 I'm sorry. I have to get my head back in this  
16 report. Yes, we did.

17 Q. Okay. Would you take a look at the  
18 report and explain how you did that?

19 A. Sure. If you go back to page 10,  
20 this is only going to be meaningful to the  
21 economists in this room, but this is a technical  
22 description, a mathematical description of what  
23 the model does.

24 One of the questions that was important  
25 here was when the cutback occurred. So we felt

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1 like we needed to add some degree of detail about  
2 timing. And in particular if a farmer had put a  
3 crop in the ground, had expended some money to,  
4 you know, to prepare the soil and bring the plant  
5 up to that particular point, the economic loss  
6 then would be the difference between revenue and  
7 the remaining variable costs. The costs already  
8 suspended would be sunk, and for some crops that  
9 difference can be large. So the timing aspect  
10 had to do more with the timing of the outlays on  
11 the cost side.

12 Q. How did you determine the constraints  
13 that you used?

14 A. Well, the groundwater pumping  
15 constraint was given to us, as I remember, by the  
16 water districts that we worked for. They survey  
17 farmers with respect to pump capacity, and I  
18 believe, and again, this is just my recollection,  
19 I believe they provided us that information.

20 Q. Did you assume that farmers would  
21 maximize profit?

22 A. Yes.

23 Q. I'm sorry. There were other  
24 constraints that I think you were going to  
25 address?

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1           A.    Sure.  The water balance constraint I  
2 think is just an adding-up constraint.  It's a  
3 mathematical identity, or almost like what we  
4 would call an equation of motion.  There may be  
5 others.  Again, I haven't looked at this report  
6 for some time.

7           Q.   How did you determine the storage  
8 surface water?

9           A.    I don't remember.

10          Q.    Is sufficient information given here  
11 in the report to determine that?

12          A.    Perhaps.

13          Q.    I know it's been a number of months  
14 since you finished this, but do you see any other  
15 explanation, other than what we see at the bottom  
16 of page 10, top of page 11 on the surface water  
17 aspect?

18          A.    Yeah, looking through here, I'm  
19 remembering a few things.  I think a lot of the  
20 hydrologic and water supply parameters were  
21 provided by the districts that are part of this,  
22 San Luis Delta Mendota Water Authority.  The  
23 information, for example, on monthly supply  
24 allocations.

25          Q.    How were the cost functions developed

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1           using the groundwater information?

2           A.    Sorry.

3           Q.    How were the cost functions developed  
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4 using the groundwater information?

5 A. The groundwater pumping is a  
6 component of cost of production. On page 11 we  
7 describe that the variable cost of additional  
8 groundwater pumping is a function of the amount  
9 of drawdown, or the distance between the land  
10 surface and the upper extent of the aquifer.

11 Q. Can you describe your production  
12 model specifications?

13 A. Page 10, which is part of the  
14 technical appendix, lays out the mathematical  
15 equation that we maximized as part of the  
16 production Delta model which was used in this  
17 case. It's an example of what I would  
18 characterize as the micro parameter, or a  
19 rationing production function. So in economic  
20 terms, all of the responses assumed to take place  
21 on the extensive margin.

22 Q. The model that you used here, is this  
23 a farm level model?

24 A. It's a regional model.

25 Q. With respect to the groundwater

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1 issue. In your criticism of the Kansas report in  
2 this case, I believe you had some criticisms that  
3 were related to the groundwater issue. What were  
4 those?

5 A. It didn't appear to me that the

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6 Kansas report considered the existence of  
7 commingled acres. The availability of  
8 groundwater as a substitute supply wasn't really  
9 mentioned in the report.

10 Q. Did you determine whether there was  
11 any need to get into that subject area?

12 A. I obtained some information that  
13 indicated to me that groundwater, at least on  
14 some acreage, is available as a substitute supply  
15 and can be used to compensate or mitigate losses  
16 in surface water deliveries.

17 Q. How much acreage did you determine  
18 that groundwater was available on?

19 A. I can't say that I have anything  
20 definitive on that score, but just to name one  
21 document -- it's going to take me a minute to  
22 find this. Here's an April 2nd, 2008 document  
23 from the Kansas Department of Agriculture that  
24 refers to -- it's a series of responses to  
25 questions, and one of the questions has to do

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1 with number of acres within KBID that may be  
2 irrigated by the supplemental groundwater. And  
3 Kansas answer, it's very short, it says  
4 groundwater from wells is authorized to be voted  
5 on 13,912 acres within KBID.

6 Q. Did you check to determine whether  
7 any of those 13,000 acres were acres that were  
8 also receiving surface water?

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9 A. I attempted to but was not able to  
10 find information that was that detailed.

11 Q. So your criticism in this area  
12 depends upon the degree to which those acres were  
13 surface water acres, receiving the kind of water  
14 that's being analyzed, the economic effect of  
15 which is being analyzed here; isn't that right?

16 A. Well, the Kansas report not  
17 necessarily, perhaps but not necessarily. The  
18 Kansas report refers to the aggregate amount of  
19 irrigated acreage in KBID, and then it adjusts  
20 that up or down or refers to adjustments, up or  
21 down, based on water availability. So this is an  
22 area that I think has to be investigated further.

23 Q. Do you know what the number of  
24 authorized acres is in KBID?

25 A. I can look through my binder and find

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1 it for you if you want me to.

2 Q. Well, there's no need to. But the  
3 issue that you're raising depends on the degree  
4 to which groundwater could be applied to  
5 supplement the missing surface water; isn't that  
6 right?

7 A. Yes, hence the term, commingled.

8 Q. In addition to your assertion that  
9 Kansas analysis -- well, secondary impacts was  
10 wrong because it didn't use the computable

11 2009.02.27 - Deposition of David Sunding  
general equilibrium models?

12 A. I think that overstates my testimony.

13 Q. Okay.

14 A. I wouldn't say it was wrong. As I  
15 mentioned at the outset, IMPLAN is a  
16 commonly-used technique, certainly not unique to  
17 this situation. I think it was some well-known  
18 problems, theoretically and otherwise. We  
19 haven't talked much about the data issues  
20 associated with IMPLAN, but I think those are  
21 well-known. Computable general equilibrium  
22 modeling is in my view a preferable technique. I  
23 think it's more theoretically justified, but  
24 again IMPLAN is certainly commonly used.

25 Q. And in fact you have used it?

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1 A. Yes.

2 Q. But in addition to the particular  
3 technique, you had a further criticism and what  
4 was that?

5 A. That requiring Nebraska to make a  
6 payment for indirect impacts has the potential to  
7 result in overcompensation for the simple reason  
8 that Nebraska's payment of damages to Kansas, if  
9 it ever comes to that, will create its own  
10 positive indirect impacts.

11 So just to be clear, I'm not arguing that  
12 indirect impacts don't exist, they do. What I'm  
13 questioning is whether or not it's appropriate as

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14 an economic matter for Kansas to recover for  
15 indirect impacts in addition to direct impacts.  
16 In my judgment, it's not.

17 Q. Does your position have any support  
18 in the literature?

19 A. This isn't an issue that usually  
20 comes up in economics literature. I can't think  
21 of a paper that touches on this subject at all.

22 Q. And your thought is that if there's a  
23 payment it will create its own secondary impact,  
24 perhaps positive in a way that would cancel out  
25 some or all of the negative impacts of the

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1 secondary impacts that were the basis of the  
2 award itself?

3 A. Yes.

4 Q. I think you point out that that  
5 depends critically on what happens to any  
6 payment?

7 A. You mean how Kansas spends the money?

8 Q. Right.

9 A. Yes.

10 Q. If it were returned to the same  
11 farmers in the same time frame and used in the  
12 same way as the money that was lost, then you  
13 would have the kind of congruency that would be  
14 needed to satisfy your condition; right?

15 A. As a practical matter, I think it's

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16 impossible to achieve a situation where every  
17 individual citizen of Kansas is compensated. So  
18 I, in a sense, reject the premise of your  
19 question.

20 Q. Well, let me ask it this way: It's  
21 clear, isn't it, that the conditions for having  
22 similar secondary impacts, but with the sign  
23 changed --

24 A. Uh-huh.

25 Q. -- don't exist; is that right?

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1 A. You're going to have to explain that.

2 Q. It can't be returned and fed into the  
3 economy to cancel out the ripple effects that  
4 have been produced by the alleged shortfall in  
5 water deliveries?

6 A. Do you mean individual by individual?

7 Q. Or some equivalent of that, yes.

8 A. I don't know what an equivalent of  
9 that means, but I think my earlier point I'll  
10 stand by, that I think it's impossible to achieve  
11 compensation at the level of the individual. I  
12 think that's just not something that's feasible.

13 Q. And just on the idea that you're  
14 suggesting, such a payment would simply be part  
15 of restoring the status quo in Kansas; wouldn't  
16 it?

17 A. The payment per direct impacts?

18 Q. Direct and indirect.

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19 A. No, it would result in an  
20 overcompensation. That's my point.

21 Q. Wouldn't this simply be restoring the  
22 status quo in Kansas, and therefore not producing  
23 some independent secondary impact that Kansas  
24 owes Nebraska for?

25 A. No. It would produce independent

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1 secondary impacts. That's my point.

2 Q. But those are the ripple effects that  
3 normal economic activity which has been removed  
4 by the Nebraska violations stopped simply  
5 restoring those?

6 A. I understand. But the act of  
7 restoration generates its own multiplier effects,  
8 resulting in a situation where Nebraska is being  
9 asked to overcompensate.

10 Q. So you're suggesting that the  
11 recovery, if there is one, should be limited to  
12 the direct impacts?

13 A. That's exactly what I'm suggesting.

14 Q. And that the negative impacts that  
15 were suffered by the State of Kansas should go  
16 uncompensated?

17 A. They will be compensated by the  
18 payment of direct impacts.

19 Q. So there's no net secondary impact  
20 between the, if you have a, if you have a payment

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21 of direct impact, in your opinion?

22 A. I think that depends to some degree  
23 on how the money is spent. But that's not, as I  
24 point out in my report, that's not something that  
25 Nebraska can control. It would create a

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1 situation of what we economists call moral  
2 hazards. For how Kansas acts determines what  
3 Nebraska is required to pay and that's  
4 fundamentally unfair in my view.

5 MR. DRAPER: I think I've got your  
6 view straight. Thank you. May we take a short  
7 break and we can come back and finish this up.

8 (A short recess was taken.)

9 Q. Doctor, let me ask you to turn to  
10 page 14 in your report which we've identified as  
11 Exhibit 16 to the deposition. That's your report  
12 for Nebraska?

13 A. All right. Which page again?

14 Q. Page 14.

15 A. Yes.

16 Q. This is under your section, actually  
17 it starts at the bottom of page 13 entitled  
18 analysis of market data?

19 A. Yes.

20 Q. You have a section on page 14  
21 entitled land rents?

22 A. Yes.

23 Q. Is your discussion here part of your  
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24 investigation, or describe part of your  
25 investigation on market, of market data?

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1 A. Yes, sir, it does.

2 Q. Are land rents one of the more  
3 important elements of the market data that's  
4 available?

5 A. Yes.

6 Q. And would you describe your analysis  
7 regarding land rents and your conclusions?

8 A. Sure. The basic task here was to  
9 look at publically available information at, you  
10 know, some level of disaggregation on land rents,  
11 or what farmers paid to landowners to produce on  
12 irrigated versus nonirrigated land. The prime  
13 source of information that I was able to locate  
14 was a, as I mentioned earlier, a Kansas State  
15 University publication by, I believe it's  
16 pronounced Dhuyvetter and Kastens on Kansas land  
17 prices and cash rental rates.

18 Q. Looking at footnote 8 on page 14.

19 A. Yes, that's correct.

20 Q. And what information did you find  
21 from the report by Dr. Dhuyvetter and Dr.  
22 Kastens? And Dhuyvetter by the way is spelled  
23 D H U Y V E T T E R.

24 A. I got the pronunciation right.

25 Q. Perfect. Right on.

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1           A.    So the most important information,  
2   empirical information is in the third paragraph  
3   and that relates to information on market prices  
4   for irrigated and nonirrigated cropland in the  
5   years in question here, 2005 and 2006.

6           Q.    What conclusions did you draw about  
7   the value of water from that analysis?

8           A.    That there was a small, but  
9   consistent premium farmers were willing to pay on  
10   a market basis for access to irrigated cropland.  
11   \$33 in 2006, \$34 in 2005.

12          Q.    And that's per acre?

13          A.    That's correct, per acre per year.

14          Q.    And did you translate that to a per  
15   acre foot value?

16          A.    Yes.

17          Q.    What was that?

18          A.    Using 15 inches per acre in KBID. A  
19   simple division. Price per acre per year divided  
20   by acre foot per acre. Once you do all the  
21   canceling, gives you price per acre foot.

22          Q.    Canceling your units there?

23          A.    Right, exactly.

24          Q.    What was your final result on that?

25          A.    It came out to \$26.8 per acre foot.

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1 Q. Okay.

2 A. Not worrying about the small  
3 difference in observed land rents between '05 and  
4 '06.

5 Q. Did you include in your analysis of  
6 the market values the purchases that the State of  
7 Nebraska has made of blocks of water across the  
8 state line in Nebraska in recent years?

9 A. No. No, just what's on the page  
10 here.

11 Q. Did the people from Nebraska explain  
12 those transactions to you?

13 A. We may have discussed it. I can't  
14 recall anything in too much detail.

15 (Deposition Exhibit Number 18 was  
16 marked for identification.)

17 Q. Let me hand you what has been marked  
18 as Exhibit 18 to the deposition. This is a  
19 memorandum from one of the officials at the  
20 Department of Natural Resources in Nebraska  
21 discussing purchases of water from the irrigation  
22 districts. And you can see there's a table on  
23 the first page that relates to purchases from  
24 various irrigation districts, Frenchman Valley,  
25 Riverside and Bostwick and the amount of water

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1 purchased and the cost and the calculated cost

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per acre foot and -- do you see that?

3 A. Yes, I do.

4 Q. On the next page we see a similar  
5 table for 2007, slightly different mix of  
6 irrigation districts, and again the water  
7 available and the cost to buy that water and the  
8 calculated cost per acre foot.

9 A. Yes.

10 Q. Are these kind of values, the kind of  
11 values that would be relevant to your market  
12 analysis?

13 A. It's impossible for me to say at this  
14 point. I mean you just gave this to me.

15 Q. Well, what would you need to know?

16 A. I couldn't give you a comprehensive  
17 list of things I would need to evaluate now. I  
18 would need to spend some time with this to  
19 determine how relevant it is.

20 Q. It's in a slightly different area, so  
21 that might be a reason; right? For instance, in  
22 the first table you can see what's listed as the  
23 Bostwick project. That would be the Nebraska  
24 Bostwick project?

25 A. Again, I haven't had sufficient time

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1 to analyze this. I can't offer an opinion one  
2 way or another.

3 Q. But its values of, just as a general  
4 matter, its values of transactions in water as a

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5 general rule are things that should be  
6 investigated to see how relevant they are to the  
7 market analysis, would you agree?

8 A. That would be something to take a  
9 look at, yes.

10 Q. And up to this point, you haven't  
11 been aware of these transactions?

12 A. No. I'm certainly not aware of this  
13 memo, whatever this is.

14 Q. On page 14 of your report where we  
15 were before, your report for Nebraska, you're  
16 critical, if I understand your words in the  
17 fourth paragraph of the Kansas experts' values  
18 for water of \$85 and \$121 per acre foot,  
19 depending whether it was 2005 or 2006; is that  
20 right?

21 A. Yes. As I indicate there, I think  
22 the fact that those are so far out of line with  
23 real world market data, indicates to me that  
24 there's a problem with their model. That there's  
25 something overstated about their results.

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1 Q. If it turns out these are relevant in  
2 the latest exhibit, documentation, if it were  
3 relevant, which I understand you haven't had a  
4 chance to determine, but it's showing values in  
5 the range of the Kansas experts; isn't it?

6 A. Again, I haven't had adequate time to

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7 analyze any of this information. I see numbers  
8 that are all over the place in here. So I'll  
9 have to take a look at this.

10 Q. Well, for instance, on the front page  
11 for 2006, the calculated average appears to be a  
12 little in excess of a hundred dollars per acre  
13 foot and it's not calculated on the second page,  
14 but most of those values on the second page for  
15 2007 are well in excess of a hundred dollars,  
16 especially when compared to the amounts of those  
17 transactions?

18 A. Again, I have no idea what this is,  
19 how these numbers were calculated, how relevant  
20 they are to what we're discussing here. I can't  
21 offer any opinion on it right now.

22 Q. If it were to turn out hypothetically  
23 that you didn't disagree with the Kansas experts  
24 evaluation on the rents, just hypothetically, you  
25 would still have objections to their analysis

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CROSS - SUNDING (Wilmoth)

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1 with respect to the secondary impact, and what  
2 other areas?

3 A. Well, they're really are only two  
4 basic areas. There's a calculation of direct  
5 losses and a calculation of indirect losses. I  
6 think the calculation of indirect losses is  
7 flawed conceptually and fundamentally, no matter  
8 what model is used, whether it's IMPLAN or a  
9 computable general equilibrium model. So in my

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10 view that's easy to get rid of. The direct  
11 losses we've been through already. Those rely on  
12 the calculations based on IPYsim and I have told  
13 you why I don't think those are appropriate.

14 MR. DRAPER: I think that will do it  
15 Professor Sunding, thank you very much.

16 THE WITNESS: You're most welcome.

17 MR. WILMOTH: I have a couple of  
18 questions for Dr. Sunding. I don't need to take  
19 a break unless you want to.

20 MR. DRAPER: There's no need.

21 CROSS-EXAMINATION

22 BY MR. WILMOTH:

23 Q. Dr. Sunding, I would like to direct  
24 your attention back to Exhibit 17, please.

25 A. All right.

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CROSS - SUNDING (Wilmoth)

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1 Q. I believe you indicated earlier that  
2 this study was conducted essentially in  
3 anticipation of a potential water loss; is that  
4 accurate?

5 A. Yes, that's correct, it's forward  
6 looking.

7 Q. In the case in which we're having our  
8 discussion today, do you understand that to be a  
9 forward looking or retrospective view?

10 A. It's a retrospective analysis.

11 Q. One of the things that you mentioned

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12 in response to Mr. Draper's questions about  
13 indirect impact was a potential that if a damages  
14 payment were made based on direct impacts, there  
15 would be some indirect benefit from that, is that  
16 an accurate statement?

17 A. Yes.

18 Q. And do I understand you correctly  
19 that essentially because of that, regardless of  
20 whether an IMPLAN model or a -- the other model  
21 that's used --

22 MR. DRAPER: CGE.

23 Q. -- to calculate the indirect damages  
24 essentially, the concept, you don't agree with  
25 the potential for those damages?

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CROSS - SUNDING (Wilmoth)

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1 A. Right.

2 Q. The specific question that I'm about  
3 to ask you essentially relates to your views with  
4 respect to Exhibit 17 and how they might change  
5 if the entity involved essentially provided a  
6 subsidy on the front end in order to offset the  
7 damages you anticipated. You understand what my  
8 hypothetical is?

9 A. I think I do.

10 Q. So in other words, whatever direct  
11 damages you anticipated, before those damages  
12 were incurred the entity provided a subsidy to  
13 offset those?

14 A. Yes.

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15 Q. You understand my hypothetical?

16 A. I do.

17 Q. My question specifically is how do  
18 you believe that if that were to occur, it would  
19 affect the conclusions in this report, Exhibit  
20 17?

21 A. Well, it would net things out to  
22 zero. If a subsidy were provided that netted out  
23 the direct impacts to zero, the indirect impacts  
24 would net out to zero, as well. If it were given  
25 to the exact -- if the subsidy were given to the

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CROSS - SUNDING (Wilmoth)

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1 exact same individual who was suffering the  
2 direct losses in exactly the magnitude that they  
3 were suffering them, then the indirect impacts  
4 would net out to zero.

5 MR. WILMOTH: Thank you. That's  
6 all I have.

7 MR. DRAPER: No further questions.

8 (The deposition was concluded at the  
9 hour of 11:27 a.m.)

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1                                   - C E R T I F I C A T E -

2       STATE OF NEBRASKA    )  
3       COUNTY OF DOUGLAS   ) ss.

4               I, Gary Thibault, General Notary Public  
5       within and for the State of Nebraska, do hereby  
6       certify that I served as the Court Reporter for  
7       the within cause on the date aforesaid and that  
8       the within transcript is a true and correct  
9       extension of my stenotype notes taken at the  
10       aforesaid time and place and reduced to writing  
11       by means of computer aided transcription.

12                   Dated this 2nd day of March, 2009.

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