

1 Indianapolis, Indiana  
2 November 9, 2009  
3 1:00 P.M. (EST)  
4  
5 (Reporter marked documents for  
6 identification as Petitioner's  
7 Exhibit Nos. C, D, D-Confidential,  
8 E, F, F-1 through and including  
9 F-6, G, G-1 through and including  
10 G-5, J, K, L, and M)  
11  
12 JUDGE STORMS: Let's go ahead and  
13 go back on the record.  
14 Petitioner, you may call your next  
15 witness.  
16 MS. HERRIMAN: Thank you, Your  
17 Honor.  
18 Petitioner calls Robert D.  
19 Moreland.  
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1     **ROBERT D. MORELAND**, a witness appearing on behalf  
2                                   of the Petitioner, having  
3                                   been first duly sworn,  
4                                   testified on Direct and  
5                                   Rebuttal as follows:

6

7     **DIRECT EXAMINATION,**

8             **QUESTIONS BY MS. HERRIMAN:**

9     Q   Good afternoon, Mr. Moreland.   Could you  
10        please state your name for the record?

11    A   Robert D. Moreland.

12    Q   Could you please state your employer and  
13        position?

14    A   Duke Energy Business Services, and I'm the  
15        Vice President of Analytical and Investment  
16        Engineering.

17    Q   You have before you a document that has been  
18        marked for identification purposes as  
19        Petitioner's Exhibit B.

20    A   Yes.

21    Q   Is that a copy of your prefiled direct  
22        testimony in this cause?

23    A   Yes, it is.

24    Q   Do you have any changes or corrections to that  
25        testimony?

1 A I have one change.

2 On Line 15 of the first page, I  
3 struck the words "marketing of combustion  
4 byproducts".

5 Q Have you marked the change on the Commission's  
6 version and initialed that change?

7 A Yes, I have.

8 Q Were there any other changes?

9 A No, that's it.

10 Q If I were to ask you the same questions today,  
11 taking into account the change that you just  
12 made, would your answers be the same?

13 A Yes, they would.

14 Q Do you adopt Petitioner's Exhibit B and your  
15 Confidential Sub-Exhibits B-1 and B-2 as your  
16 sworn testimony in this cause?

17 A I don't see the sub-exhibits. Are they in  
18 here?

19 Q Yes.

20 A Yes.

21 Q Okay.

22 MS. HERRIMAN: Your Honor,  
23 Petitioner offers into evidence Petitioner's  
24 Exhibit B, Confidential Exhibit B and  
25 Confidential Sub-Exhibits B-1 and B-2 into

1       this cause.

2                   JUDGE STORMS:  Is there any  
3       objection?  If not, we'll show Petitioner's  
4       Exhibit B and Confidential Exhibits B, B-1 and  
5       B-2 admitted into this cause.

6                   MS. HERRIMAN:  Thank Your Honor.

7  
8                   (PETITIONER'S EXHIBIT NO. B, BEING  
9       THE PREFILED DIRECT TESTIMONY OF  
10      MR. ROBERT D. MORELAND, ADMITTED  
11      INTO EVIDENCE.)

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1 (PETITIONER'S EXHIBIT NOS.  
2 CONFIDENTIAL B, CONFIDENTIAL B-1  
3 AND CONFIDENTIAL B-2, ALL BEING  
4 CONFIDENTIAL EXHIBITS, ADMITTED  
5 INTO EVIDENCE ON A CONFIDENTIAL  
6 BASIS. )  
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1     **DIRECT EXAMINATION OF MR. ROBERT D. MORELAND,**

2             **(Continuing)**

3             **QUESTIONS BY MS. HERRIMAN: (Continuing)**

4     Q   You also have before you a document that has  
5         been marked for identification purposes as  
6         Petitioner's Exhibit I.

7     A   Yes.

8     Q   Is that a copy of your prefiled rebuttal  
9         testimony and exhibits in this cause?

10    A   Yes, it is.

11    Q   Do you have any changes or corrections to your  
12         testimony?

13    A   No.

14    Q   If I were to ask you the same questions today,  
15         would your answers be the same?

16    A   Yes, they would.

17    Q   Do you adopt Petitioner's Exhibit I with your  
18         Confidential Sub-Exhibits I-1 and I-2 as your  
19         sworn testimony in this cause?

20    A   Yes.

21                     MS. HERRIMAN: Your Honor,  
22         Petitioner offers into evidence Petitioner's  
23         Exhibit I and Confidential Exhibits I, I-1 and  
24         I-2.

25                     MR. POLK: Your Honor, can I ask

1       some preliminary questions to determine  
2       whether I want to make an objection here?

3                   JUDGE STORMS:   Yes, you may.

4                   MR. POLK:   All right.

5

6       **PRELIMINARY QUESTIONS OF MR. ROBERT D. MORELAND,**

7       **BY MR. POLK:**

8   Q   Mr. Moreland, do you know when your testimony  
9       was filed with the Commission?

10  A   The direct testimony?

11  Q   The rebuttal testimony, sorry.

12  A   I don't recall the exact day.  It would have  
13       been a couple of weeks ago.

14  Q   Well, I think October 30th.

15  A   Okay.

16  Q   Okay.  Are you aware of whether the  
17       confidential exhibits were e-mailed to counsel  
18       for the other parties when your testimony was  
19       prefiled with the Commission, or were they  
20       delivered the following Monday on the 2nd?

21  A   I do not know.

22  Q   Okay.

23                   MR. POLK:   Your Honor, I'm going  
24       to object to the admission of the confidential  
25       exhibits.  They were, I think, hand delivered

1 to counsel that Monday, the 2nd, I believe,  
2 with five days for discovery. If we had been  
3 able to review it that day and perform -- and  
4 even serve discovery, we wouldn't be getting  
5 answers until close of business today, which  
6 makes it difficult to prepare for  
7 cross-examination of those exhibits.

8 JUDGE STORMS: Is there a  
9 response?

10 MS. KARN: Your Honor, I think --  
11 I have to go back and check our records, but I  
12 think that is accurate that the confidential  
13 stuff was submitted or hand delivered the next  
14 day, but even if it had been mailed, it  
15 wouldn't have been received until that time  
16 period, which is, I think, what was specified  
17 for service in this case, and, you know,  
18 regardless of when they would have gotten  
19 discovery, no discovery was issued to Duke  
20 Indiana, and we certainly would have made  
21 every effort to expedite that and get it done  
22 in time for the hearing in this cause as we  
23 have done in numerous other proceedings in the  
24 past.

25 MR. POLK: Specifically looking



1       at -- And the real objection here is with  
2       Exhibit I-2, which is a net present value  
3       analysis. Testimony was raised by CAC  
4       witnesses about not having done a cost benefit  
5       analysis as part of the case-in-chief, and  
6       having it submitted as part of the rebuttal  
7       without ample time to do discovery, which we  
8       knew when we received it that we wouldn't have  
9       ample time to get discovery responses on this,  
10      you know, again, raises questions about  
11      whether that exhibit should be admitted  
12      because we don't have time to prepare for the  
13      cross-examination of that exhibit.

14               Some of the rebuttal testimony,  
15      which directly deals with, you know, what was  
16      raised by other witnesses, is one thing, but  
17      having essentially new evidence on a cost  
18      benefit analysis that previously had not been  
19      done, had not been supplied to us and which  
20      our testimony was based on that not being in  
21      the record, creates a problem.

22               JUDGE STORMS: Mr. Polk, is there  
23      a reason this issue wasn't raised with the  
24      Commission prior to the hearing this  
25      afternoon? If you were having difficulties

1 with service, that certainly would be a  
2 concern to the Presiding Officers that -- and  
3 I am just wondering if there is a reason that  
4 wasn't presented to us or raised to us -- what  
5 was that, last week? Is that when it would  
6 have been, October the -- November 2nd?

7 MR. POLK: You're right. It would  
8 have been -- it was hand delivered on the 2nd.  
9 I was out of the office that day and didn't  
10 realize confidential exhibits were going to be  
11 in there. I didn't take a look at the  
12 testimony until that evening and looked at the  
13 exhibit.

14 You know, I checked the Prehearing  
15 Conference Order and didn't see anything in  
16 the Prehearing Conference Order about raising  
17 any objections in advance, and it just skipped  
18 my mind with everything going on last week and  
19 this week and prepping over the weekend for  
20 this.

21 JUDGE STORMS: Okay. I'll rule on  
22 the objection. A couple of things come to  
23 mind, and I think we touch on a couple of them  
24 with respect to the objection, but the first  
25 one is to the extent the parties are having

1 difficulties with either submitting documents  
2 in a timely manner or having concerns with  
3 discovery, particularly with the compressed  
4 time frame that was available, there are  
5 provisions in the Prehearing Conference Order  
6 that contemplate objections being made to the  
7 Commission, and we did not hear any  
8 objections, and it's my understanding that  
9 discovery was not submitted and did not result  
10 in the compressed time frame or the inability  
11 to respond that Mr. Polk indicated would have  
12 been the problem if, perhaps, it would have  
13 been submitted to Duke Energy Indiana.

14 At any rate, if any of these steps  
15 would have been taken, it would have been  
16 brought to the Presiding Officers' attention  
17 prior to this afternoon, which I think would  
18 have been useful and would have been  
19 consistent with the Prehearing Conference  
20 Order.

21 Therefore, we are going to show  
22 Petitioner's Exhibits I, Confidential I, I-1  
23 and I-2 admitted into this cause over CAC's  
24 objection.

25 MS. KARN: Your Honor, I need to

1       make one correction to the confidential  
2       exhibits.  There's actually just Exhibits I,  
3       Confidential I-1 and I-2.  There is no I  
4       Confidential.  I apologize for that  
5       misstatement.

6                       JUDGE STORMS:  Okay.

7  
8                       (PETITIONER'S EXHIBIT NO. I, BEING  
9                       THE PREFILED REBUTTAL TESTIMONY OF  
10                      MR. ROBERT D. MORELAND, ADMITTED  
11                      INTO EVIDENCE.)

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1 (PETITIONER'S EXHIBIT NOS. I-1 AND  
2 I-2, BEING CONFIDENTIAL EXHIBITS,  
3 ADMITTED INTO EVIDENCE ON A  
4 CONFIDENTIAL BASIS.)  
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1 MS. HERRIMAN: Your Honor, Mr.  
2 Moreland is available for cross-examination.  
3 JUDGE STORMS: Okay. Mr. Hartley?  
4 MR. HARTLEY: No questions, Your  
5 Honor.  
6 JUDGE STORMS: Mr. Polk?  
7 MR. POLK: Thank you, Your Honor.  
8  
9 **CROSS-EXAMINATION OF MR. ROBERT D. MORELAND,**  
10 **QUESTIONS BY MR. POLK:**  
11 Q Good afternoon, Mr. Moreland.  
12 A Good afternoon.  
13 Q Now, you state in your rebuttal testimony on  
14 Page 2 at Line 8 that "We continue to be  
15 advised that the Mt. Simon sandstone formation  
16 found in the Illinois Basin remains a  
17 potentially robust storage reservoir. . ."  
18 When you say "we", that means Duke Energy?  
19 A Yes.  
20 Q All right, and who is advising Duke Energy  
21 that the Mt. Simon sandstone formation  
22 continues to be a potentially robust storage  
23 reservoir?  
24 A Our technical experts, Mr. Tombari and Mr.  
25 Rupp.

1 Q All right, and Edwardsport is part of the Mt.  
2 Simon -- is located over the Mt. Simon  
3 formation; correct?

4 A Yes, that is correct.

5 Q And the testing done at Edwardsport showed  
6 that it was more or less suitable for carbon  
7 storage at that location?

8 A The Mt. Simon formation?

9 Q No, at Edwardsport, within a, you know,  
10 10-mile radius of Edwardsport. That's over  
11 the Mt. Simon formation; correct?

12 A That is correct.

13 Q All right, and is it suitable to store carbon  
14 under Edwardsport?

15 A The question was there's more than one  
16 formation there, but the Mt. Simon -- our  
17 testing indicated that it was too little  
18 porosity and permeability to be a very good  
19 site for sequestration.

20 COMMISSIONER ZIEGNER: Mr.  
21 Moreland, could you move the mike closer?  
22 We're having difficulty hearing you. Thank  
23 you.

24 WITNESS MORELAND: Sorry.

25 Q So they found out that that particular part of

1 the Mt. Simon formation was not appropriate?

2 A Yes, that's correct.

3 Q And are those problems similar to what they  
4 found in, I think it was, Darke County over in  
5 Ohio?

6 A I'm not aware of there being a geological  
7 problem there.

8 Q Are you saying there was not a geological  
9 problem in Darke County?

10 A I'm not intimately familiar with that example,  
11 but I have -- what I have read and heard, I  
12 had not heard that there was any geological  
13 issues.

14 Q So, if the area underneath the Edwardsport  
15 plant, which is part of the Mt. Simon  
16 sandstone formation, isn't appropriate, it's  
17 quite possible that there are a lot of areas  
18 of the Mt. Simon sandstone formation that  
19 aren't appropriate; correct?

20 A Based upon the learnings that have taken place  
21 recently, it would appear that areas that are  
22 very far beneath the earth's surface, those  
23 portions of Mt. Simon, say, below 7,500 feet  
24 or so, may be too dense for them to be a good  
25 reservoir, so portions of the Mt. Simon would



1       not be where other portions would be.

2   Q   Okay, and is that based on your background as  
3       a geologist or based on what experts have  
4       advised you?

5   A   Based on what experts have advised me.

6   Q   Okay, and, in fact, it's not unusual to base  
7       your opinions on what other folks have -- what  
8       other experts have advised you of; correct?

9   A   In this particular case, we have to rely on  
10      people who have experience beyond our own  
11      because this is going beyond the normal  
12      generation of power and delivering it to our  
13      customers.

14   Q   All right, but you're not on the Witness Stand  
15      today saying that it's Duke position that you  
16      have to be a geologist to testify to any of  
17      the subject matters that you just talked  
18      about, that you can rely on the advice of  
19      others; right?

20   A   As long as it's founded, yes.

21   Q   Okay. Now, Duke has applied for federal money  
22      to help pay for the study; correct?

23   A   That is correct.

24   Q   All right, and Duke has also proposed  
25      modifying the study if it doesn't get the

1 federal dollars; correct?

2 A Correct.

3 Q Okay. Has Duke proposed modifying the study  
4 if it gets the federal dollars but doesn't get  
5 all of the ratepayer dollars it's asked for?

6 A I'm sorry, I didn't follow the question.

7 Q Well, if the study can be modified if the  
8 federal dollars don't materialize, would Duke  
9 proceed with a modified study if it had  
10 federal dollars but did not have ratepayer  
11 dollars?

12 A Ultimately, that would be a decision beyond  
13 myself whether we would proceed or not.

14 Q But do you think it's a reasonable idea to say  
15 we've got a modified proposal if we don't get  
16 the full amount of money, and regardless of  
17 where that money comes from, if we don't get  
18 the full amount, we should continue with the  
19 study, or is it only if you don't get federal  
20 dollars that you'll modify it?

21 A As we have currently proposed, it's based on  
22 only if we don't get federal funding.

23 Q Now, have you built in an escalation factor to  
24 the cost estimate for the study?

25 A Yes.

1 Q And what is that escalation factor?

2 A 2.5 percent.

3 Q Now, my recollection may be a little bit  
4 fuzzy, so I'm going to have to rely on yours  
5 here.

6 Was that the same escalation  
7 factor originally included in the Edwardsport  
8 cost estimate for the power plant itself?

9 A My -- it would probably depend upon at what  
10 point in time the estimate was put together.  
11 My recollection back that far is a little  
12 fuzzy, too.

13 Q Do you believe that once you actually get into  
14 the study, there will be a higher or lower  
15 likelihood of significant cost increases?

16 A We made our best attempt at putting the  
17 estimate together, not driving it where it was  
18 higher or lower, more likely to be higher or  
19 lower, so I don't think I can really estimate  
20 that.

21 Q Does the company have contracts with the folks  
22 who are doing the seismological testing?

23 A No, not yet.

24 Q Okay. Have you acquired the rights to any of  
25 the property that you would be doing testing

1       on?

2    A   No.

3    Q   Does the company have contracts with any of  
4       the vendors that would be doing the drilling  
5       of the wells?

6    A   No.

7    Q   All right.  Has the company performed a FEED  
8       study on what would be necessary to implement  
9       the study of long-term carbon waste storage  
10      that it proposes?

11   A   If by FEED you mean like a preliminary  
12      engineering study, is that what you're  
13      referring to?

14   Q   A comprehensive engineering study or --

15   A   No, that would -- the initial phases of that  
16      would be a part of this study, and then the  
17      final design work would come as a part of the  
18      implementation.

19   Q   Okay.  Do you recall how large an increase in  
20      the cost estimate occurred between when the  
21      FEED study was completed for the Edwardsport  
22      IGCC plant and when it had executed most of  
23      its contracts and came back in for CWIP  
24      approval?

25   A   No, I don't.

1 Q My recollection is it went up about 18 percent  
2 from a little under 2 billion to \$2.35  
3 billion. Is that your recollection?

4 A Again, I'm not sure. That seems reasonable,  
5 but, I mean, that's why we've added a  
6 contingency to our proposal.

7 Q But you would agree that an 18 percent  
8 increase is a whole lot more than a 2.5  
9 percent increase; right?

10 A Yes.

11 Q All right. Is the revised proposal inadequate  
12 to achieve the company's needs?

13 A Could you be more specific about needs?

14 Q Well, the company has originally proposed one  
15 study, and with the possibility of not getting  
16 federal dollars, proposed a revised study, and  
17 the question is: Is that revised study  
18 sufficient, or would it be a waste of time to  
19 perform that revised study?

20 A The revised study would bring us to a point in  
21 the process but not complete the site  
22 characterization, and as my testimony states,  
23 we would then need to come back to the  
24 Commission to -- based upon what we've learned  
25 so far to finalize the direction forward.

1 Q Would it be fair to say, then, that the  
2 revised study is not so much a revised study  
3 but a revised financing of the study?

4 A I don't think I would characterize it as  
5 financing; it's a phased approach, a portion  
6 of the study being done, and then another  
7 portion would have to be done subsequent to  
8 that.

9 Q So, essentially, it would be the same study,  
10 but it would be done in two different phases  
11 with a second regulatory proceeding to get  
12 cost recovery for the second phase.

13 A Unless by that time there had been some  
14 changes in the scope of the study.

15 Q Does that mean the scope of the study could  
16 increase?

17 A Potentially.

18 MR. POLK: Excuse me, Your Honor.

19 If I could have a minute here to --

20 Q Now, on Page 12 of your rebuttal testimony,  
21 you indicate that -- at Line 12, given the  
22 large number of uncertainties, the company has  
23 found it difficult to accurately calculate a  
24 net present value for the carbon management  
25 plan.

1                   Is that calculating a net present  
2     value or NPV of the implementation of carbon  
3     storage or of the study of carbon storage?

4    A   Both.

5    Q   Now, I think you also state somewhere that you  
6     think carbon capture and storage helps ensure  
7     that coal remains a viable option.

8                   If you can't calculate the NPV,  
9     how can you be sure that --

10   A   Where did I state that?

11   Q   Page 12, Lines 15 through 18. "Even so, Duke  
12   Energy Indiana would not embark on this study  
13   if it did not believe that carbon capture and  
14   sequestration remained an important and viable  
15   option to reduce costs to customers in a  
16   carbon constrained future."

17                   If you can't calculate the net  
18   present value, how can you be confident that  
19   it remains a viable option?

20   A   Well, again, we've tried to estimate the cost  
21   and the value of allowances and done our best  
22   job to try and estimate what the potential  
23   cost savings might be, but it still remains  
24   one of the technologies that is believed to be  
25   very important for addressing carbon in the

1 future.

2 Q Based on the -- and I'm looking at Page 13  
3 here of your rebuttal testimony, Line 5 and  
4 following there, "Given the accuracy of the  
5 cost and performance estimates for the project  
6 at this time. . ."

7 When you say "the project", does  
8 that mean the study or the implementation of  
9 long-term carbon waste storage?

10 A Both.

11 Q Now, you say "Given the accuracy of the cost  
12 and performance estimates. . ." You've also  
13 said you can't calculate accurately the net  
14 present value; correct?

15 A Well, what was -- we were trying -- what I  
16 tried to highlight earlier in my testimony is  
17 there still remain uncertainties, and we have  
18 attempted to assess the potential value going  
19 into the future by performing the study and  
20 implementing carbon sequestration including  
21 the contingency that was outlined in my  
22 testimony.

23 Q Well, just talking about the study here,  
24 there's a whole lot of uncertainties, aren't  
25 there?



1 A Yes.

2 Q Okay, and we just talked earlier that you  
3 don't have contracts with a number of the key  
4 vendors; you don't have a detailed engineering  
5 study, which is very reminiscent of where we  
6 were with the original cost estimate that the  
7 Commission approved for the Edwardsport IGCC,  
8 which then once the contracts were let, went  
9 up by 18 percent. That seems to be a whole  
10 lot of uncertainty that could occur here if  
11 the same thing happens here; correct?

12 A If that same thing happens, then we would be  
13 under our cost estimate.

14 Q But there at Lines 7 and 8, you indicate that  
15 on a stand-alone net present value basis, the  
16 cost of the project would be slightly higher  
17 than buying allowances, and yet with all of  
18 those uncertainties and the escalation factor,  
19 that would make it even less of a bargain,  
20 wouldn't it?

21 A Yes. I think you have to weigh the  
22 uncertainties against the available incentives  
23 today. You have to consider whether the risk  
24 of moving now while there are still more --  
25 while there are still some uncertainties given

1       that it's an early project, whether or not  
2       there's enough value in those incentives that  
3       you want to take that risk and move forward,  
4       and by incentives, I'm talking about the DOE  
5       funding and then the incentives that are in  
6       the current climate change legislation.

7   Q   Okay, but the DOE funding hasn't been  
8       approved; correct?

9   A   Not yet, no.

10  Q   And the climate legislation or climate change  
11       legislation hasn't been passed yet, has it?

12  A   No.

13  Q   All right.

14  A   Those are the uncertainties.

15  Q   And then there are also uncertainties about  
16       what the actual price will be for drilling  
17       wells, what the actual cost will be to acquire  
18       the land, what the actual cost will be for the  
19       contractors to do the seismic testing.

20  A   That's right, and that was one of the  
21       sensitivities that you see in that chart that  
22       we provided for if the capital cost was over  
23       and above the -- our estimate with the  
24       25 percent contingency. Then there is a  
25       30 percent range on top of that.

1 Q Now, there on Page 13 at Line 17 and  
2 following, you indicate that the company  
3 believes it is prudent to keep its options  
4 open and to maximize eligibility for the  
5 time-sensitive incentives. That's the DOE  
6 money and the potential legislative  
7 incentives.

8 A That's correct.

9 Q All right. How strongly does the company  
10 believe that it's prudent to keep its options  
11 open?

12 A I don't know that I can measure that. I think  
13 we feel like it's the right thing to do at  
14 this time.

15 Q Do you have any experience in purchasing  
16 options, financial or real estate options or  
17 anything like that?

18 A No.

19 Q Do you believe that if it's important to keep  
20 your options open, that sometimes you need to  
21 pay a deposit or have some skin in the game in  
22 order to keep those options open, that it's  
23 worth paying that price?

24 A Not necessarily, no.

25 Q When would you say it's not worth having some

1 skin in the game or paying part of the price  
2 in order to keep your options open?

3 A Well, in this particular case, the benefit  
4 flows back to the customer because if this  
5 project is implemented, the CO2 reduction that  
6 is taken reduces the cost of producing the  
7 electricity, and then that flows back to the  
8 ratepayer.

9 Q How does adding capture and sequestration to a  
10 power plant reduce the cost of generating  
11 electricity?

12 A By reducing -- under proposed climate change  
13 legislation, by reducing the cost of the  
14 allowances that we would have to use for that  
15 power plant, by reducing the number of  
16 allowances.

17 Q Okay, but if allowances are cheaper, it  
18 doesn't reduce the cost to customers, does it?

19 A Cheaper than --

20 Q Than the cost of capture and storage.

21 A No, it would not.

22 Q And in addition to the cost of allowances  
23 versus the cost of capture and storage, isn't  
24 it also important for the Commission to take  
25 into consideration that capture also reduces

1       the amount of power output that the plant has  
2       available for retail end use customers as does  
3       the energy needed to store carbon underground,  
4       doesn't it?

5   A   Yes, we took that into our analysis.

6   Q   So, there's a huge efficiency loss with  
7       capture and storage, isn't there?

8   A   For an IGCC at 50 to 60 percent capture rate,  
9       it's about a 7 percent loss.

10   Q   What were the -- what was the price of carbon  
11       allowances used in your NPV calculation?

12   A   It was a series of annual prices that were  
13       done by the Energy Information Administration  
14       most recently based upon the analysis of the  
15       Waxman Markey bill.

16   Q   So, when you say it's important for the  
17       company to keep its options open, and yet  
18       there are times when you shouldn't pay to keep  
19       those options open and the company doesn't  
20       have any skin in the game and the shareholders  
21       aren't paying for any portion of these  
22       studies, should that be taken as an indication  
23       that the company actually doesn't feel that  
24       strongly about keeping its options open, that  
25       it's unwilling to pay for any of the study

1       itself?

2    A   Well, it's keeping its options open so that it  
3       can provide the power to its customers at the  
4       least cost.

5    Q   Carbon capture and the long-term storage of  
6       carbon waste would require a huge capital  
7       investment, wouldn't it?

8    A   Yes, it's a lot of money.

9    Q   Yes, and the company gets a return on its  
10       capital investment, doesn't it?

11   A   Yes.

12   Q   All right. So, isn't this really about  
13       keeping the company's options open, about  
14       having increased capital investment because in  
15       the long run, larger capital investments  
16       creates a larger return for shareholders which  
17       increases the net present value of the  
18       company's stock?

19   A   Increases the net present value of our stock,  
20       is that what you said?

21   Q   Yes.

22   A   I don't know about the net present value of  
23       the stock. I'm not familiar with that.

24   Q   All right. On Page 13, Line 19 and following,  
25       you say "Once the studies are complete. . ."

1       Studies is plural there. Can you tell me --  
2       is there more than one study the company plans  
3       to do? Is there a study other than the one  
4       that's proposed in this proceeding that you  
5       are referring to there?

6   A   No, it is the studies that are a part of this  
7       proposal.

8   Q   Okay. Thank you, Mr. Moreland.

9                       MR. POLK: No further questions,  
10       Your Honor.

11                      JUDGE STORMS: Ms. Becker?

12                      MS. BECKER: None, Your Honor.

13                      JUDGE STORMS: Mr. Stewart, your  
14       witness.

15                      MR. STEWART: Thank you, Your  
16       Honor.

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1     **CROSS-EXAMINATION OF MR. ROBERT D. MORELAND,**

2             **QUESTIONS BY MR. STEWART:**

3     Q    Good afternoon.

4     A    Good afternoon.

5     Q    Now, I understand that if you get a  
6           significant amount of federal funding, your  
7           proposal is to go full speed ahead, but if you  
8           don't, that you're going to do a phase-in, and  
9           the first phase is 43 million -- Well, no, I  
10          take that back.

11                    If you get a substantial or  
12           significant amount of federal funding, you'd  
13           go with the full project as proposed, and then  
14           if you don't, that you would phase it in along  
15           the lines as described in your testimony;  
16           correct?

17    A    Yes, that's our recommendation.

18    Q    Okay, and when you say a significant CCPI  
19           funding at the bottom of Page 4, how much is  
20           significant?

21    A    Great question.  You know, I don't think -- we  
22           never drew like a line that says, well, if  
23           it's a dollar more than this, let's move  
24           forward; if it's a dollar less, let's not move  
25           forward.  You know, in my opinion, if it's



1 two-thirds of what we requested, in my  
2 opinion, then we should move forward, and if  
3 it's much less than that, then I think we need  
4 to come back and take a different approach.

5 Q So, if the Commission approved the, if you  
6 will, bifurcated approach that if it was  
7 significant, you would go forward, and if it  
8 wasn't, you'd phase it in, there's no line or  
9 anything for the Commission to know in advance  
10 what it would be that would trigger that;  
11 that's what you just said?

12 A I don't know the legal processes and how we  
13 communicate that information to the Commission  
14 about how much we got and whether we think  
15 it's the right amount or not. I think that's  
16 something we still need to resolve.

17 Q If you got 43 million, which I understand to  
18 be toward the top of what you think you would  
19 be eligible for; is that correct?

20 A No, the 40 -- that is just for the study  
21 portion.

22 Q Isn't that all we're talking about in this  
23 proceeding?

24 A Yes, sir. That's all we're requesting in this  
25 proceeding. We requested much more than that

1 as a part of the DOE application.

2 Q Okay. So your DOE application would also

3 cover implementation?

4 A Yes.

5 Q And what percentage of implementation would it

6 pay?

7 A It would be a similar portion to what's

8 contemplated in the study, probably in the

9 neighborhood of 35 to 40 percent.

10 Q Okay. I thought that the study got a full

11 50 percent of allowable costs.

12 A That is correct.

13 Q Okay. I'm still looking at Page 4. That's

14 where I get the 43 million from.

15 A 43 of the rebuttal?

16 Q Page 4 of the rebuttal, yes.

17 A Page 4 of the rebuttal.

18 Q Line 14.

19 So, for purposes of the study,

20 which is what is pending before the Commission

21 now, does it indicate that you would get up to

22 maybe 43 million, and that would leave

23 77 million left over for the ratepayers to

24 cover under your proposal?

25 A That's correct.

1 Q Okay. Do you have knowledge of what Duke's  
2 response would be if the Commission said,  
3 great, you know, let's say you got the 43  
4 million, and then they just split the 77;  
5 33-and-a-half each have to be paid for by Duke  
6 or shareholders and the other half to be paid  
7 for by the ratepayers and no recovery of the  
8 half paid for by Duke. Do you know what the  
9 attitude of Duke would be to that?

10 A No. That's not my position to make those  
11 calls.

12 Q Okay. Now, on Page 5, you indicate that in  
13 Confidential Exhibit B-2 -- and I don't  
14 believe that that number in the parentheses is  
15 confidential there, is it? Right after that  
16 at Line 3.

17 A I don't believe so, no.

18 Q Okay. You say -- assuming that you went  
19 forward with everything, I'm reading this to  
20 say approximately \$116 million excluding  
21 carrying costs; is that right?

22 A That's correct.

23 Q Okay. Is the difference between 116 and 121  
24 the carrying costs, or has the estimate come  
25 down?

1 A No. The original 121 estimate was based upon  
2 an assumption of a tracker and that we would  
3 collect then the allowance for funds, and that  
4 was the estimate for that, and so the 116 is  
5 the number without any of those dollars  
6 included.

7 Q Okay. Well, picking up that language right  
8 there, which I kind of like, what would you  
9 say if the Commission approved the project but  
10 excluded carrying costs? Would Duke continue  
11 on with the project in that circumstance?

12 A Those are questions for Mr. Stanley.

13 Q Well, your testimony goes into great detail  
14 about the project and what it costs and how  
15 much the company is asking to be allowed in  
16 rates; is that correct?

17 A That's correct.

18 Q Did you sit in meetings with people to -- when  
19 the determination as to what to ask for was  
20 made, or did somebody just come to you and say  
21 ask for 43 and 77 or however it comes out?

22 A No. I was a part of the group that developed  
23 the estimate of how much it would cost.

24 Q Were you part of the group that discussed how  
25 to proceed here at the Commission and what to

1 ask for?

2 A I was part of some of those discussions; I'm  
3 not sure I was part of all of them.

4 Q In all of those discussions, you never heard  
5 anybody address the possibility that the  
6 Commission might not give Duke every single  
7 thing it was asking for?

8 A I think there was -- not specifically that.  
9 I'm sure we recognized that, you know, it's  
10 possible that the Commission may not want to  
11 move forward with this project.

12 Q Or they may want to move forward with it but  
13 just not exactly the way you propose.

14 A I don't recall any discussion of that.

15 Q Okay. Let's turn back to Page 13 of your  
16 testimony.

17 At Line 9, there's a sentence  
18 talking about -- right where Mr. Polk left  
19 off. There's a significant improvement in  
20 project economics, early-mover incentives  
21 including bonus allowances, investment tax  
22 credits and CCPI Round 3 grant funding  
23 opportunity.

24 Is Duke going to flow all benefits  
25 received that are listed here back to

1       ratepayers including 100 percent of the value  
2       of all allowances, 100 percent of the value of  
3       all tax benefits and 100 percent of all  
4       benefits, whether known or unknown at this  
5       time, in exchange for the ratepayers funding  
6       100 percent of the cost and bearing  
7       100 percent of the risk of this project?

8    A   I don't think I can answer a question as broad  
9       as all benefits whether they're known or  
10       unknown at this time. I don't know what all  
11       that might include.

12   Q   Okay. Well, we'll go one at a time, then.  
13       What about bonus allowances?

14   A   That's my understanding, yes, that they would  
15       flow back to the customer.

16   Q   Tax investment credits.

17   A   Yes.

18   Q   All of the grant funding.

19   A   Yes, that would -- they would go against the  
20       cost of the project.

21   Q   Now, with respect to that, if you jump back to  
22       Page 5 for a second, at Line 4, you indicate  
23       that the customers will be credited with the  
24       DOE funding net of costs to comply with the  
25       grant requirements, and Jim Stanley and Diana

1 Douglas both said net of grant rules and  
2 regulations.

3 Can you tell me what the  
4 difference between the grant requirements and  
5 the grant rules and regulations are?

6 A I think they're the same thing.

7 Q Okay. Then can you tell me what we're talking  
8 about there? What are you taking away from me  
9 that you're going to define as a grant  
10 requirement?

11 A There's certain requirements under the  
12 granting process where -- that are spelled out  
13 in the request for grants like you have to use  
14 labor at the prevailing wage rate; you have to  
15 attempt to buy American products in order to  
16 construct the facility. Some of those will  
17 likely apply to our project.

18 Q Well, how would either of those impact the  
19 amount of the grant? I don't understand when  
20 we're saying net of costs to comply; help me  
21 understand that.

22 A Those are just costs that we will incur in  
23 order to perform the project, and there's  
24 certain obligations we will have, some  
25 reporting obligations back to the government,

1       certain obligations we will have to use  
2       certain things in which -- so, yes, that's it.

3   Q   Okay. Well, you hit one there that I want to  
4       follow up on. Reporting obligations, who's  
5       going to do the reporting obligations?

6   A   We would have to do that.

7   Q   Why are you going to take money off the grant  
8       to cover that?

9   A   It would just be a part of the cost of doing  
10      the project.

11  Q   But you came in for rates at some point in the  
12      past, and you included in those rates the cost  
13      of your employees, the cost of your services  
14      company. Aren't those the same people who  
15      will be performing these tasks?

16  A   That's a better question for Diana Douglas. I  
17      don't believe all of our engineers are  
18      embedded in the base rates.

19  Q   Well, we don't -- do we follow and monitor all  
20      of your engineers and track that? Is that one  
21      of the Duke trackers? It's not, is it?

22  A   Not that I am aware of.

23  Q   No. You just get the same amount in rates,  
24      and then if it's not adequate, you come back  
25      in, right, for a rate case?



1 A Right.

2 Q Well, why does it say that in here net of cost

3 to comply if you can't explain to me -- I

4 mean, why did you testify to that?

5 A Because there are some things that we will

6 have to do as a part of the project, and we

7 just wanted to make sure that that was known.

8 Q The project meaning the implementation?

9 A The study and the implementation.

10 Q Okay. Well, when you talked about the costs

11 for labor, would that be in the study as well?

12 A Possibly. We'd have to look at that.

13 Q That would just be part of the cost that you

14 flow through or that you account for later on;

15 right?

16 A Yes.

17 Q Okay, but the full amount of the grant would

18 be applied to that?

19 A That's my understanding.

20 Q Okay.

21 MR. STEWART: Thank you very much.

22 JUDGE STORMS: Mr. Tolliver, your

23 witness.

24 MR. TOLLIVER: Thank you, Your

25 Honor.

1     **CROSS-EXAMINATION OF MR. ROBERT D. MORELAND,**

2             **QUESTIONS BY MR. TOLLIVER:**

3     Q    Good afternoon, Mr. Moreland.

4     A    Good afternoon.

5     Q    You would agree that there is a high level of  
6           uncertainty surrounding this project, wouldn't  
7           you?

8     A    Yes, sir.

9     Q    And just based upon my own reading of the  
10          testimony, there's some uncertainty  
11          surrounding the storage resulting from an  
12          increase in the carbon capture rate from 20 to  
13          50 to 60 percent; there's issues regarding  
14          this 50-mile radius, whether there's anything  
15          there suitable for storage of this; there are  
16          other things I would say that are -- enhanced  
17          oil recovery is questionable; whether there's  
18          a CO2 pipeline that is available to transport  
19          this or whether somebody is willing to build  
20          the CO2 pipeline and transport this; there are  
21          a number of state and federal regulations that  
22          are just up in the air at this point.

23                    I think this is accurate; part of  
24          the reason for the 25 percent contingency is a  
25          result of all of these uncertainties, isn't

1       it?

2    A   That's correct.

3    Q   I think Mr. Stewart may have asked you this  
4       question before, but I don't -- where is the  
5       stopping point? At what point does Duke  
6       intend to say, you know what, there's just too  
7       many uncertainties here; there's nothing else  
8       for us to do. Is it after the 120 million has  
9       been spent?

10   A   No, not necessarily. I'd say it could happen  
11       at any time through the process if we really  
12       felt like something materially had changed; if  
13       there was some change in direction by the  
14       administration that they were not going to  
15       regulate CO2 emissions, though I think that's  
16       unlikely.

17                If we went down a path, for  
18       example, and learned early in the assessment  
19       that it was not going to be viable, that there  
20       wasn't a whole lot of interest, we would stop  
21       pursuing that piece of it and just focus on  
22       the balance, and so there -- it will be an  
23       evolving process as we go through this to  
24       define where the options -- where the value  
25       really is, and we will stop going down the

1 paths where there is not value.

2 Q Well, let's take it the next step further.

3 Let's say you're near the end; you're about  
4 ready to exhaust the 120 million. Is it  
5 possible that you could come back in and say  
6 you know what, we're really sure this time  
7 that we found something that's going to lead  
8 to success in this project, and we need more  
9 money. You're not ruling that out, are you?

10 A Well, though I certainly would hope that that  
11 doesn't happen, I mean, I can't say with  
12 100 percent certainty that we will be able to  
13 finish all of the studies with the money, but  
14 we certainly believe -- certainly hope and  
15 believe with what we know today that we can.  
16 If rules that get promulgated require that  
17 more testing is done than we have  
18 contemplated, I suppose that's possible.

19 Q Let's talk a little bit about the clean coal  
20 power initiative funding or CCPI.

21 On Page 4 of your rebuttal  
22 testimony, you discussed Duke's portion of the  
23 study costs if it receives CCPI funding, and  
24 the full 50 percent match from DOE is not  
25 guaranteed; correct?

1 A That is correct.

2 Q And Duke could receive less than the 43  
3 million that it has used for these estimated  
4 estimates.

5 A That's correct.

6 Q And the current request is that ratepayers  
7 would cover any of the additional direct costs  
8 that are not covered by CCPI.

9 A Yes.

10 Q I see on Line 17, you talk about the costs for  
11 Indiana, Duke Energy Indiana, customers --  
12 I've actually started on Line 15. It's  
13 approximately 77 million for total site  
14 assessment characterization activities. Do  
15 you see where I'm referring to?

16 A Yes.

17 Q But the full study itself is \$120 million.

18 A Yes. That was based upon the original  
19 proposal, original estimated cost of 121  
20 million before the deferral was envisioned.

21 Q But the ratepayers' costs include an  
22 additional -- out of that 120 -- 121 million  
23 that you're referring to, that includes 34  
24 million in indirect costs, overhead and other  
25 contingencies; correct?

1 A Yes, assuming that all of the contingency was  
2 used.

3 Q And a lot of this is within Duke's control;  
4 Duke has some control over indirect costs,  
5 overheads, but there's some steps that Duke  
6 can take to control that contingency factor,  
7 isn't there?

8 A And we will do the very best job we can in  
9 doing that.

10 Q What about if Duke does not receive the CCPI  
11 funding? You've agreed to scale back the  
12 request of \$42 million; is that correct?

13 A Correct.

14 Q And I believe the scaled back activities will  
15 take place within one year.

16 A Yes, approximately. It should be completed by  
17 approximately the end of next year.

18 Q And in addition -- Well, as part of that \$42  
19 million, that includes an escalation factor,  
20 doesn't it?

21 A One year's worth of escalation for those  
22 activities next year.

23 Q Do you expect inflation to significantly  
24 increase in the next 12 months?

25 A 2.5 percent does not seem unreasonable.

1 Q You're probably right, but isn't there also a  
2 25 percent contingency that's added on to  
3 that?

4 A There is -- Give me just a second.  
5 It appears that we did the  
6 escalation after the 25 percent was applied.

7 Q So, 2.5 percent inflation is probably not too  
8 far off, but you don't have a problem with 2.5  
9 percent plus 25 percent?

10 A It would have -- we would have escalated it  
11 after we had applied the contingency, so there  
12 was escalation on the contingency, that's  
13 correct.

14 Q Escalation on a contingency and escalation as  
15 well as the contingency; that is correct?  
16 There's an escalation factor and a contingency  
17 factor that's included in that amount?

18 A Right, yes.

19 Q Thank you.

20 A The contingency itself doesn't -- the percent  
21 of contingency doesn't escalate. It's just we  
22 applied the contingency to the direct cost,  
23 and then that direct -- then that value is  
24 escalated into the future.

25 Q Do you know -- does Duke's request incorporate

1       the jurisdictional allocation factor  
2       established in Duke's last rate case?  
3   A   In the -- I think this is what you're  
4       referring to. At the bottom of the  
5       confidential exhibit, and I'll try not to get  
6       into the confidential material, it shows the  
7       number, I think, with and without that  
8       jurisdictional allocation that you're  
9       referring to.

10                   MR. TOLLIVER: May I have a  
11       minute, Your Honor?

12                   JUDGE STORMS: If there's a need  
13       to address specific numbers, I mean, we can  
14       certainly go in camera. If you think you can  
15       ask the questions in such a way and provide  
16       the responses, Mr. Moreland, in such a way  
17       without needing to do that, that's fine, but  
18       please be careful with respect to your  
19       responses. There's no reason we can't go in  
20       camera if we need to.

21                   Please proceed.

22                   MR. TOLLIVER: Thank you, Your  
23       Honor, for reminding us of that. We don't  
24       think we need to go in camera. Actually, I'll  
25       just go ahead and move on.



1 Q Have you calculated the additional allowances  
2 that Duke has proposed for this study that  
3 includes the escalation contingency costs,  
4 indirect costs, internal engineering costs,  
5 overhead --

6 A We have calculated them, and they are shown on  
7 the exhibit.

8 Q Thank you, and we've had some of our people  
9 look at it. Would you agree that this  
10 factor adds up -- that these numbers add up to  
11 about 44.5 percent of the overall study costs?

12 A That's what I was trying to avoid. Yes.

13 Q Well, let's --

14 A Since these are numbers on the confidential  
15 exhibit, that's why I was not going into  
16 those.

17 MR. TOLLIVER: We're okay, aren't  
18 we?

19 JUDGE STORMS: I don't have the  
20 confidential exhibit in front of me, and  
21 that's why I cautioned the parties, but I  
22 don't know if the percentage is actually on  
23 there. I mean, you've said that, so that is  
24 no longer -- Confidential is on there, but I  
25 don't know that that specific number is on

1       there.

2                   MR. HELMEN:   Can we go off the  
3       record?

4                   JUDGE STORMS:   Yes, let's go off  
5       the record.

6

7                   (Off-the-Record Discussion)

8

9                   JUDGE STORMS:   Let's go ahead and  
10      go back on the record.

11                   We just had a brief discussion  
12      just to clarify for the record regarding the  
13      confidential information, and there was some  
14      concern with respect to what could be answered  
15      appropriately and what could not be answered  
16      appropriately, and we've determined that  
17      everything that could be answered  
18      appropriately was in public forum.  I, again,  
19      reminded the parties that if we needed to go  
20      in camera, we certainly can do that, and we  
21      will do it as necessary, but I think I've been  
22      assured that we can move on to additional  
23      questions, so please proceed.

24                   MR. TOLLIVER:   Thank you, Your  
25      Honor.

1 Q (Mr. Tolliver Continuing) As part of that  
2 44.5 percent figure that we discussed earlier,  
3 it includes internal engineering costs?  
4 A Internal engineering, yes, would be a part of  
5 either direct or indirect costs.  
6 Q Wouldn't internal engineering costs be a part  
7 of base rates and have already been paid for  
8 by ratepayers?  
9 A I would not think so, but that's a better  
10 question for Ms. Douglas.  
11 Q Are you aware of any study or just  
12 construction project in and of itself that's  
13 been given a 44.5 percent contingency or  
14 cushion?  
15 A Just to be clear, the numbers here that I see  
16 add up to 42 percent, so is the other 2.5  
17 you're referring to the escalation?  
18 Q I believe so; I believe that's accurate. Yes.  
19 A It is higher than our normal amount of  
20 escalation -- or of -- I'm sorry. It is  
21 higher than our normal amount of contingency  
22 that we might have for a project, and that is  
23 due to the various uncertainties that we've  
24 talked about already and the fact that this is  
25 a new project, a new technology, and there may

1       be things out there that we're going to have  
2       to do that we haven't contemplated yet, and  
3       that's the reason for adding a contingency to  
4       make everyone aware that it could be more than  
5       just the base amount.

6   Q   What's your typical contingency on a project  
7       or a study?

8   A   It depends upon the -- how far along you are  
9       in the process of engineering the project.  
10   Early in a project like this, it's obviously  
11   going to be higher. 15 percent is not  
12   unusual, and then as you've refined your  
13   engineering estimate, you start backing out  
14   that contingency.

15   Q   And here we have -- you know, 15 percent is  
16       not unusual; here we have 42, 44.5 percent  
17       contingency, and --

18   A   No. I'm sorry; go ahead and finish your  
19       question.

20   Q   Oh, no, go ahead. Correct me if I'm wrong.

21   A   The contingency is 25 percent.

22   Q   Contingency plus the indirects and --

23   A   Yes. Those are typical indirects, and that's  
24       a typical escalation rate that we would use  
25       for a project.

1 Q The 44.5 percent is typical?

2 A Well, the 44.5 percent has 25 percent  
3 contingency as a part of that number, and what  
4 I said was that for a project that we were  
5 doing, a mature technology that we've done  
6 many times before, at this point in the  
7 process, we might have about a 15 percent  
8 contingency, so that number -- your 44.5  
9 number might drop down to 34.5.

10 Q I have a question about the 3D seismic  
11 analysis. Do you know -- is this technique  
12 necessary to detect a potential study spot for  
13 enhanced oil recovery or EOR?

14 A If the reservoir for -- you're talking about  
15 for EOR?

16 Q Correct.

17 A I'm sure it's a technique that has been used  
18 in actual early characterization of the oil  
19 field. I don't know that we would have to do  
20 this now or that it would -- or that the oil  
21 field operator would have to do that. Mr.  
22 Rupp can probably answer those questions  
23 better than I can.

24 MR. TOLLIVER: May I have one  
25 minute, Your Honor?

1 JUDGE STORMS: Yes.  
2 MR. TOLLIVER: Thank you, Your  
3 Honor. We have no further questions.  
4 JUDGE STORMS: Thank you.  
5 Redirect for this witness?  
6 MS. KARN: Could we have just a  
7 minute or so, Your Honor, please?  
8 JUDGE STORMS: Yes.  
9 MS. KARN: Thank you.  
10 JUDGE STORMS: Let's go off the  
11 record.  
12  
13 (Off-the-Record Discussion)  
14  
15 JUDGE STORMS: Let's go ahead and  
16 go back on the record.  
17 Please proceed.  
18 MS. HERRIMAN: Just one redirect  
19 for Mr. Moreland.  
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1     **REDIRECT EXAMINATION OF MR. ROBERT D. MORELAND,**

2     **QUESTION BY MS. HERRIMAN:**

3     Q   You were talking with Mr. Polk, and during  
4         those questions, you stated that the scope of  
5         the study could decrease -- or you said, I  
6         believe, increase as we moved forward. Could  
7         the scope of the study also decrease?

8     A   Absolutely. As I mentioned later on in the  
9         questioning, as we go through this process, we  
10        have a number of different approaches we're  
11        looking at, and any of those we find that are  
12        not viable or do not appear to be economic,  
13        then we would eliminate that further scope.  
14        We would stop that activity and eliminate that  
15        scope.

16                   MS. HERRIMAN: Thank you. Nothing  
17        further.

18                   JUDGE STORMS: Thank you.  
19        Commissioner Ziegner.

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1     **QUESTIONS OF MR. ROBERT D. MORELAND,**

2             **BY COMMISSIONER ZIEGNER:**

3     Q   Mr. Moreland, what, if any, saline aquifer  
4         sequestration site research activities are you  
5         going to conduct in central Indiana?

6     A   Certainly, the -- Are you referring to just  
7         the saline or non-saline, also?  I'm sorry.

8     Q   Any.

9     A   Either one?  Okay.

10                 The reason I hesitate is just  
11         exactly what encompasses central Indiana.  Our  
12         study for deep saline will look about 50 miles  
13         north of the plant site and in an area that is  
14         basically -- we characterized it as a  
15         semi-circle to the north of the plant site  
16         because we believe the geology will be better  
17         moving north.

18                 On the non-saline side, we have  
19         taken a little broader view of potential sites  
20         because we wanted to capture existing oil  
21         fields and depleted oil and gas wells, and so  
22         that's a scope of about 150 miles that we  
23         would be looking at, but, again, there we're  
24         going to be focusing more on existing oil  
25         fields and gas fields.



1 Q And when you talk about -- you spoke in  
2 response to some cross-examination questions  
3 about long-term sequestration liability. What  
4 value did you use for that in your net present  
5 value analysis?

6 A That we did not try and estimate. That's not  
7 in there.

8 COMMISSIONER ZIEGNER: That's all  
9 I have. Thank you.

10 JUDGE STORMS: Mr. Moreland, thank  
11 you very much for your testimony. You are  
12 excused.

13 Let's take about a ten-minute  
14 break.

15

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18 (WITNESS ROBERT D. MORELAND EXCUSED

19 ON DIRECT AND REBUTTAL)

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25 (HEARING IN RECESS UNTIL 2:25 P.M., SAME DAY)

1 Indianapolis, Indiana  
2 November 9, 2009  
3 2:25 P.M. (EST)  
4

5 JUDGE STORMS: Let's go ahead and  
6 go back on the record.

7 Petitioner, you may call your next  
8 witness.

9 MR. DuMOND: Thank you, Your  
10 Honor. Petitioner calls Ms. Darlene  
11 Radcliffe.  
12

13 **DARLENE S. RADCLIFFE**, a witness appearing on  
14 behalf of the Petitioner,  
15 having been first duly  
16 sworn, testified on Direct  
17 and Rebuttal as follows:  
18

19 **DIRECT EXAMINATION,**

20 **QUESTIONS BY MR. DuMOND:**

21 Q Good afternoon.

22 A Good afternoon.

23 Q Please state your name for the record.

24 A Darlene Radcliffe.

25 Q Please identify your employer and your

1 position with your employer.

2 A Duke Energy, Director of Environmental  
3 Technology and Fuel Policy.

4 Q Do you have before you a document that has  
5 been previously identified as Petitioner's  
6 Exhibit C?

7 A Yes.

8 Q Can you identify that document, please?

9 A It's my direct testimony.

10 Q Do you have any changes or corrections in your  
11 direct testimony?

12 A Yes, I do.

13 The first is on Page 6, Line 7,  
14 and I'd like to change the sentence to read,  
15 "The MRCSP's primary Phase III project was  
16 expected to be hosted at an ethanol plant in  
17 Greenville, Ohio with an expected CO2  
18 injection date of 2010, but that project has  
19 been withdrawn from consideration. Battelle,  
20 on behalf of the MRCSP, is currently  
21 discussing projects with potential Phase III  
22 host sites.", and then I would delete the  
23 sentence that starts "The CO2. . ." to the end  
24 of the ". . .eligible for DOE Phase III  
25 funding."

1                           The second change is on --

2    Q   Excuse me, Ms. Radcliffe.

3    A   I'm sorry.

4    Q   Have those changes been marked on the

5       Commission's copy of your testimony?

6    A   Yes, they have.

7    Q   And have you initialed those changes?

8    A   Yes.

9    Q   And dated them?

10   A   Yes.

11   Q   Please proceed.

12   A   The next change is on Page 11, Line 5, and I

13       need to add the word "allowable" in front of

14       "costs".

15   Q   And, again, have you initialed that change and

16       dated it?

17   A   Yes.

18   Q   Do you have any further changes to your direct

19       testimony?

20   A   No.

21   Q   If I were to ask you the same questions today,

22       taking into account the changes you just

23       mentioned in this proceeding, would your

24       answers be the same?

25   A   Yes.

1 Q And do you adopt Petitioner's Exhibit C as  
2 your sworn testimony in this cause?

3 A Yes.

4 MR. DuMOND: Your Honor,  
5 Petitioner offers into evidence Petitioner's  
6 Exhibit C.

7 JUDGE STORMS: Is there any  
8 objection? If not, we'll show Petitioner's  
9 Exhibit C admitted into this cause.

10

11 (PETITIONER'S EXHIBIT NO. C, BEING  
12 THE PREFILED DIRECT TESTIMONY OF  
13 MS. DARLENE S. RADCLIFFE, ADMITTED  
14 INTO EVIDENCE.)

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1     **DIRECT EXAMINATION OF MS. DARLENE S. RADCLIFFE,**  
2         **(Continuing)**

3         **QUESTIONS BY MR. DuMOND: (Continuing)**

4     Q   And, Ms. Radcliffe, do you also have before  
5         you a document identified as Petitioner's  
6         rebuttal Exhibit J?

7     A   Yes.

8     Q   And is that your verified rebuttal testimony  
9         in this proceeding?

10    A   Yes.

11    Q   Do you have any changes or corrections to your  
12         rebuttal testimony?

13    A   No, I do not.

14    Q   And if I were to ask you the same questions as  
15         set forth therein, would your answers be the  
16         same?

17    A   Yes.

18    Q   And do you adopt Petitioner's rebuttal Exhibit  
19         J as your sworn testimony in this proceeding?

20    A   Yes.

21    Q   Okay.

22                     MR. DuMOND: Your Honor,  
23         Petitioner offers into evidence Petitioner's  
24         Exhibit J.

25                     JUDGE STORMS: If there's no

1 objection, we'll show Petitioner's rebuttal  
2 Exhibit J admitted into this cause.

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5 (PETITIONER'S EXHIBIT NO. J, BEING  
6 THE PREFILED REBUTTAL TESTIMONY OF  
7 MS. DARLENE S. RADCLIFFE, ADMITTED  
8 INTO EVIDENCE.)

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1                   MR. DuMOND: Your Honor, the  
2       witness is available for cross-examination.

3                   MR. HARTLEY: No questions.

4                   MR. POLK: No questions, Your  
5       Honor.

6                   MS. BECKER: No questions, Your  
7       Honor.

8                   JUDGE STORMS: Mr. Stewart?

9                   MR. STEWART: No questions.

10                  MR. TOLLIVER: We have no  
11       questions for this witness, Your Honor.

12                  JUDGE STORMS: Okay. Ms.  
13       Radcliffe, thank you very much for your  
14       testimony. You may step down. You are  
15       excused.

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20                  (WITNESS DARLENE S. RADCLIFFE EXCUSED

21                               ON DIRECT AND REBUTTAL)

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1 JUDGE STORMS: Petitioner, you may  
2 call your next witness.

3 MS. HERRIMAN: Petitioner calls  
4 Mr. John Tombari.

5

6 **JOHN TOMBARI**, a witness appearing on behalf of  
7 the Petitioner, having been first  
8 duly sworn, testified on Direct and  
9 Rebuttal as follows:

10

11 **DIRECT EXAMINATION,**

12 **QUESTIONS BY MS. HERRIMAN:**

13 Q Good afternoon, Mr. Tombari.

14 A Good afternoon.

15 Q Would you please state your name for the  
16 record?

17 A John Tombari.

18 Q Could you please state your employer and your  
19 position?

20 A I'm President of Schlumberger Carbon Services.

21 Q You have before you a document that's been  
22 marked for identification purposes as  
23 Petitioner's Exhibit D. Is that a copy of  
24 your prefiled direct testimony in this cause?

25 A Yes, it is.

1 Q Do you have any changes or corrections to that  
2 testimony?

3 A Yes, I do.

4 On Page 2, Sentence 10, add "I  
5 became President of SCS in 2009."

6 Q Have you marked that change on the  
7 Commission's version of the testimony and  
8 initialed that change?

9 A Yes, I have.

10 Q If I were to ask you the same questions today,  
11 taking into account the change you just made,  
12 would your answers be the same?

13 A Yes, they would.

14 Q Do you adopt Petitioner's Exhibit D as your  
15 sworn testimony in this cause?

16 A Yes, I do.

17 Q Okay.

18 MS. HERRIMAN: Your Honor,  
19 Petitioner offers into evidence Petitioner's  
20 Exhibit D --

21 JUDGE STORMS: If there's no --

22 MS. HERRIMAN: -- and D-  
23 Confidential.

24 JUDGE STORMS: D-Confidential. If  
25 there's no objection, we'll show Petitioner's

1 Exhibits D and D-Confidential admitted into  
2 this cause.

3

4 (PETITIONER'S EXHIBIT NO. D, BEING  
5 THE PREFILED DIRECT TESTIMONY OF  
6 MR. JOHN TOMBARI, ADMITTED INTO  
7 EVIDENCE.)

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1 (PETITIONER'S EXHIBIT NO.  
2 D-CONFIDENTIAL, BEING A  
3 CONFIDENTIAL DOCUMENT, ADMITTED  
4 INTO EVIDENCE ON A CONFIDENTIAL  
5 BASIS. )  
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1 MS. HERRIMAN: Thank you, Your  
2 Honor.

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4 **DIRECT EXAMINATION OF MR. JOHN TOMBARI,**

5 **(Continuing)**

6 **QUESTIONS BY MS. HERRIMAN: (Continuing)**

7 Q Mr. Tombari, do you also have a document  
8 before you that's been marked for  
9 identification purposes as Petitioner's  
10 Exhibit K?

11 A Yes, I do.

12 Q Do you also have Confidential K?

13 A Yes, I do.

14 Q Is that a copy of your prefiled rebuttal  
15 testimony in this cause?

16 A Yes, it is.

17 Q Do you have any changes or corrections to that  
18 testimony?

19 A No, I don't.

20 Q If I were to ask you the same questions today,  
21 would your answers be the same?

22 A Yes, they would.

23 Q Do you adopt Petitioner's Exhibit D as your  
24 sworn testimony in this cause?

25 A Yes, I do.

1 MS. HERRIMAN: Your Honor,  
2 Petitioner offers into evidence Petitioner's  
3 Exhibit D and Confidential D.

4 JUDGE STORMS: K; we're on K.

5 MS. HERRIMAN: I'm sorry, K and  
6 Confidential K.

7 JUDGE STORMS: If there's no  
8 objection, we'll show Petitioner's Exhibit K  
9 and Confidential K admitted into this cause.

10 MS. HERRIMAN: Thank you, Your  
11 Honor.

12  
13 (PETITIONER'S EXHIBIT NO. K, BEING  
14 THE PREFILED REBUTTAL TESTIMONY OF  
15 MR. JOHN TOMBARI, ADMITTED INTO  
16 EVIDENCE.)

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1 (PETITIONER'S EXHIBIT NO.  
2 K-CONFIDENTIAL, BEING A  
3 CONFIDENTIAL DOCUMENT, ADMITTED  
4 INTO EVIDENCE ON A CONFIDENTIAL  
5 BASIS.)  
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1 MS. HERRIMAN: Mr. Tombari is  
2 available for cross-examination.  
3 JUDGE STORMS: Mr. Hartley?  
4 MR. HARTLEY: No questions.  
5 JUDGE STORMS: Mr. Polk?  
6 MR. POLK: No questions, Your  
7 Honor.  
8 MS. BECKER: No questions.  
9 MR. STEWART: No questions.  
10 MR. TOLLIVER: We have no  
11 questions for this witness, Your Honor.  
12 JUDGE STORMS: Okay, thank you.  
13 Mr. Tombari, thank you very much  
14 for your testimony. You are excused.  
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20 (WITNESS JOHN TOMBARI EXCUSED ON  
21 DIRECT AND REBUTTAL)  
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1 JUDGE STORMS: Petitioner, you may  
2 call your next witness.

3 MS. HERRIMAN: Thank you, Your  
4 Honor.

5 Petitioner calls David C. Julius.

6  
7 **DAVID C. JULIUS**, a witness appearing on behalf of  
8 the Petitioner, having been  
9 first duly sworn, testified as  
10 follows:

11

12 **DIRECT EXAMINATION,**

13 **QUESTIONS BY MS. HERRIMAN:**

14 Q Good afternoon.

15 A Good afternoon.

16 Q Please state your name for the record.

17 A David C. Julius.

18 Q Please state your employer and position.

19 A Duke Energy Business Services. I'm a  
20 Consulting Engineer.

21 Q Do you have before you a document that has  
22 been marked for identification purposes as  
23 Petitioner's Exhibit E?

24 A I do.

25 Q Is that a copy of your prefiled direct

1 testimony in this cause?

2 A It is.

3 Q Do you have any changes or corrections to that  
4 testimony?

5 A I do.

6 On Page 2, where it says -- where  
7 it ends with the sentence "In March 2008, I  
8 transferred to Generation Engineering  
9 supporting the Edwardsport IGCC Project, which  
10 is my current role, as Consulting Engineer.",  
11 "In September 2009, I transferred to the  
12 Analytical Engineering Group, still supporting  
13 the Edwardsport IGCC Project, as a Consulting  
14 Engineer."

15 Q Have you made that change in the Commission's  
16 official copy?

17 A I have.

18 Q And initialed and dated that change?

19 A I have.

20 Q If I were to ask you the same questions today,  
21 taking into account the change you just made,  
22 would your answers be the same?

23 A Yes.

24 Q Do you adopt Petitioner's Exhibit E as your  
25 sworn testimony in this cause?

1 A I have one more correction. I'm sorry.

2 Q I'm sorry; please go ahead.

3 A On Page 18 of my testimony where it states --  
4 where it originally stated "Since that time,  
5 the Company contracted with -- or, excuse me.  
6 "Since that time, the Company has received an  
7 alternative proposal from Burns and McDonnell  
8 that is currently under review.", change that  
9 statement to "In August 2009, the Company  
10 contracted with Burns and McDonnell for those  
11 activities."

12 Q Have you made that change on the Commission's  
13 version and initialed that change?

14 A Yes, I have.

15 Q Do you have any other changes?

16 A That is all.

17 Q If I were to ask you the same questions today,  
18 taking into account both changes that you just  
19 made, would your answers be the same?

20 A Yes, they would.

21 Q Do you adopt Petitioner's Exhibit E as your  
22 sworn testimony in this cause?

23 A I do.

24 MS. HERRIMAN: Your Honor,  
25 Petitioner offers into evidence Petitioner's

1       Exhibit E.

2                   JUDGE STORMS:  Is there any  
3       objection?

4                   If not, we'll show Petitioner's  
5       Exhibit E admitted into this cause.

6                   MS. HERRIMAN:  Thank you, Your  
7       Honor.

8  
9                   (PETITIONER'S EXHIBIT NO. E, BEING  
10       THE PREFILED DIRECT TESTIMONY OF  
11       MR. DAVID C. JULIUS, ADMITTED INTO  
12       EVIDENCE.)

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1 MS. HERRIMAN: Mr. Julius is  
2 available for cross-examination.

3 JUDGE STORMS: Mr. Hartley?

4 MR. HARTLEY: No questions.

5 MR. POLK: No questions, Your  
6 Honor.

7 JUDGE STORMS: Ms. Becker?

8 MS. BECKER: No questions.

9 JUDGE STORMS: Mr. Stewart?

10 MR. STEWART: Thank you.

11

12

13 **CROSS-EXAMINATION OF MR. DAVID C. JULIUS,**

14 **QUESTIONS BY MR. STEWART:**

15 Q Good afternoon.

16 A Good afternoon.

17 Q On Page 5 of your testimony at Line 19, you  
18 reference the risks associated with a  
19 potential loss of integrity of the caprock  
20 formation.

21 A Yes.

22 Q Who does Duke anticipate will bear that risk?

23 A This sentence stipulates that we would analyze  
24 the risks associated with geological  
25 sequestration such that we would do testing

1       and analysis to evaluate what the potential  
2       risk would be.

3     Q   And if that risk turned out to happen, would  
4       Duke be assuming all responsibility associated  
5       with the loss of the integrity of the caprock  
6       formation?

7     A   As part of the project, we have a risk  
8       management process that would evaluate the  
9       potential risk associated with any loss of  
10      integrity of any caprock layer and evaluate  
11      whether or not that was a good -- whether or  
12      not that's -- that formation below the earth  
13      would be a good formation to support  
14      geological sequestration. That is going to be  
15      an evaluation point with Duke as well as our  
16      experts that we'll take into account as we  
17      would determine whether or not that would be a  
18      likely sequestration location.

19    Q   I understand that, and once you have selected  
20       a place, if there was a loss of the integrity  
21       of the caprock formation, notwithstanding your  
22       best effort to locate a place where that  
23       wouldn't happen, is Duke assuming the  
24       responsibility for all costs associated with  
25       that?

1 A Duke would be evaluating that risk associated  
2 with the potential loss to determine whether  
3 or not -- that would be a management decision  
4 of whether or not we would want to assume that  
5 risk.

6 Now, saying that we would  
7 undertake that risk with -- as far as our  
8 customers, that is something we would have to  
9 determine as part of our overall analysis of a  
10 particular site.

11 Q But you're still looking in the planning  
12 stage, and I'm looking at the  
13 post-implementation stage. Do you see the  
14 distinction?

15 A But we're not to that point at this time.

16 Q I realize that, but as part of your analysis,  
17 is it your goal to get to a  
18 post-implementation stage?

19 A Yes.

20 Q Okay, and you are assessing risks that --  
21 along the path to get you to that point?

22 A That is correct.

23 Q Once you're at that point, if there was a  
24 breach that created problems, whether it's  
25 just damage to the water or whether it comes

1 up to the surface and injures people, is Duke  
2 assuming liability for that, or would they be  
3 looking for ratepayers to bear that risk?

4 A I can't answer whether or not we would assume  
5 all complete liability. That is something  
6 that, you know, our management would have to  
7 evaluate and determine.

8 Q Okay. If you turn to Page 12 of your  
9 testimony, can you tell me where you're  
10 referencing here toward the top of the page a  
11 discussion about the enhanced oil recovery?

12 A Could you identify the specific lines you're  
13 referring to?

14 Q Top third of the page.

15 A Top third of the page? Okay. Okay, your  
16 question?

17 Q Yes. If Duke ultimately decides that enhanced  
18 oil recovery is a viable option, would all of  
19 the proceeds from the sales of carbon to those  
20 who are using it in their oil recovery be  
21 credited to ratepayers?

22 A Again, that would probably have to be  
23 something I would direct to Ms. Douglas as far  
24 as how ratepayers would be -- how those would  
25 be recovered.



1 MR. STEWART: Thank you.

2 JUDGE STORMS: Mr. Tolliver, your  
3 witness.

4 MR. TOLLIVER: Thank you, Your  
5 Honor. We have no questions for this witness  
6 at this time.

7 JUDGE STORMS: Okay. Any  
8 redirect?

9 MS. HERRIMAN: One moment, Your  
10 Honor.

11 No redirect, Your Honor.

12 JUDGE STORMS: Mr. Julius, thank  
13 you very much for your testimony. You are  
14 excused.

15 MR. HELMEN: We're rolling now.

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21 (WITNESS DAVID C. JULIUS EXCUSED)

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1 JUDGE STORMS: Petitioner, you may  
2 call your next witness.

3 MR. DuMOND: Thank you, Your  
4 Honor. Petitioner calls John Rupp.

5

6 **JOHN A. RUPP**, a witness appearing on behalf of  
7 the Petitioner, having been first  
8 duly sworn, testified on Direct and  
9 Rebuttal as follows:

10

11 **DIRECT EXAMINATION,**

12 **QUESTIONS BY MR. DuMOND:**

13 Q Good afternoon, Mr. Rupp.

14 A Good afternoon.

15 Q Please state your name for the record.

16 A My name is John A. Rupp.

17 Q Please identify your employer.

18 A I work for the Indiana Geological Survey.

19 Q What is your position?

20 A I'm the Assistant Director for Research at  
21 that institution.

22 Q The Court Reporter has presented before you a  
23 document that has been identified as

24 Petitioner's Exhibit F. Do you see that?

25 A Yes.

1 Q Can you identify that document?

2 A Yes, this is my primary testimony, my direct  
3 testimony.

4 Q Do you have any changes or corrections to your  
5 direct testimony?

6 A I do not.

7 Q And if I were to ask you the same questions as  
8 set forth in that testimony, would your  
9 answers be the same?

10 A They would.

11 Q Do you adopt Petitioner's Exhibit F including  
12 Sub-Exhibits F-1, F-2, F-3, F-4, F-5 and F-6  
13 as your sworn testimony in this proceeding?

14 A I do.

15 MR. DuMOND: Your Honor, at this  
16 time, we move for the admission of  
17 Petitioner's Exhibit F and each of the  
18 Sub-Exhibits F-1 through F-6.

19 JUDGE STORMS: Is there any  
20 objection?

21 MR. POLK: No objection, Your  
22 Honor.

23 JUDGE STORMS: If not, we'll show  
24 Petitioner's Exhibit F with Sub-Exhibits F-1  
25 through F-6 admitted into this cause.

1 (PETITIONER'S EXHIBIT NO. F, BEING  
2 THE PREFILED DIRECT TESTIMONY OF  
3 MR. JOHN A. RUPP, WITH  
4 PETITIONER'S EXHIBIT NOS. F-1  
5 THROUGH AND INCLUDING F-6 ATTACHED  
6 THERETO, ADMITTED INTO EVIDENCE.)  
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1     **DIRECT EXAMINATION OF MR. JOHN A. RUPP,**

2             **(Continuing)**

3             **QUESTIONS BY MR. DuMOND: (Continuing)**

4     Q   Mr. Rupp, do you also have before you a  
5         document that has been marked as Petitioner's  
6         rebuttal Exhibit L?

7     A   I do.

8     Q   And is that your rebuttal testimony in this  
9         proceeding?

10    A   It is.

11    Q   Do you have any changes or corrections to your  
12         rebuttal testimony?

13    A   I do not.

14    Q   If I were to ask you the questions set forth  
15         in Petitioner's rebuttal Exhibit L, would your  
16         answers be the same?

17    A   They would.

18    Q   Do you adopt Petitioner's rebuttal Exhibit L  
19         as your sworn testimony in this proceeding?

20    A   I do.

21                     MR. DuMOND: Your Honor,  
22         Petitioner offers into evidence Petitioner's  
23         rebuttal Exhibit L.

24                     JUDGE STORMS: If there's no  
25         objection, we'll show Petitioner's rebuttal

1       Exhibit L admitted into this cause.

2

3                       (PETITIONER'S EXHIBIT NO. L, BEING  
4                       THE PREFILED REBUTTAL TESTIMONY OF  
5                       MR. JOHN A. RUPP, ADMITTED INTO  
6                       EVIDENCE.)

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1                   MR. DuMOND: Your Honor, this  
2       witness is available for cross-examination.

3                   JUDGE STORMS: Mr. Hartley?

4                   MR. HARTLEY: No questions, Your  
5       Honor.

6                   JUDGE STORMS: Mr. Polk?

7                   MR. POLK: Thank you, Your Honor.

8

9       **CROSS-EXAMINATION OF MR. JOHN A. RUPP,**

10       **QUESTIONS BY MR. POLK:**

11   Q   Good afternoon, Mr. Rupp.

12   A   Good afternoon.

13   Q   I see you have a Masters Degree, but you don't  
14       have a Ph.D; correct?

15   A   That's correct.

16   Q   All right, and that Masters was in 1980.

17   A   That's correct.

18   Q   Almost 20 years ago.

19   A   That's correct.

20   Q   All right. Have you learned anything in  
21       recent years that they didn't teach you in  
22       graduate school?

23   A   Thankfully, yes.

24   Q   Did you have to take college courses to learn  
25       that?

1 A Partially, but being an institute of Indiana  
2 University is part of the academic  
3 environment. It's a very fruitful place for  
4 learning, and obviously with the Survey being  
5 in place where there's a lot of applied  
6 research, there's a lot of learning going on  
7 constantly.

8 Q And I imagine you've also learned a lot from  
9 conversations with colleagues in and outside  
10 of the discipline that you specialize in.

11 A I have.

12 Q All right, and I remember one of my college  
13 professors used to say that there was an old  
14 saying, I learned much from my teachers, more  
15 from my colleagues and most from my students.  
16 Is that a saying you've ever heard or  
17 something that you find some grain of truth  
18 in?

19 A No.

20 Q Fair enough. Are you a trained chemist?

21 A No.

22 Q All right. So, would it be fair to ask you  
23 chemistry questions?

24 A Yes, because geology has chemistry in it.

25 Q All right. Now, looking -- I'm looking at



1       your rebuttal testimony now, Lines 11 through  
2       14. This one should be easy.

3                   MR. DuMOND: What page are we on?

4                   MR. POLK: Page 1 of the rebuttal  
5       testimony, Lines 11 through 14.

6   Q   Where you talk about most often, this work  
7       that you do is associated with determining and  
8       characterizing the products and processes that  
9       are associated with fossil fuel systems  
10      including oil, gas and coal deposits.

11                  A lot of your work involves fossil  
12      fuel, doesn't it?

13   A   Yes, it does.

14   Q   You've been involved in a lot of studies about  
15      oil, gas and coal and have testified on coal  
16      in Indiana and using coal in Indiana on more  
17      than one occasion, haven't you?

18   A   Yes, I have.

19   Q   Were you compensated for your testimony in  
20      this proceeding?

21   A   Yes, I was.

22   Q   By Duke?

23   A   Yes, I was.

24   Q   All right. Is this the first time that Duke  
25      has retained you to testify on their behalf?

1 A It is the first time I've worked with Duke,  
2 yes.

3 Q All right. Now, moving on a little bit to  
4 Page 2 of your rebuttal, in Line 17 and  
5 following, you talk about how residents should  
6 not be concerned about having millions of tons  
7 of carbon dioxide stored at high pressure  
8 beneath their property.

9 What pressure would that carbon  
10 dioxide be stored at?

11 A It depends on the depth, but if minimum  
12 miscibility pressures or minimum pressures for  
13 supercritical CO<sub>2</sub> were maintained, that would  
14 be in excess of 1,080 psi.

15 Q Okay. So, at the supercritical CO<sub>2</sub> or SCCO<sub>2</sub>.

16 A That's correct.

17 Q Is that also the type of CO<sub>2</sub> that's used in  
18 enhanced oil recovery?

19 A That's correct, yes, some enhanced oil  
20 recovery; that would be miscible enhanced oil  
21 recovery. You can have immiscible, which is  
22 sub-critical.

23 Q Okay, and part of that is because the SCCO<sub>2</sub> is  
24 an excellent solvent, isn't it?

25 A Relative to enhanced oil recovery?

1 Q Well, it's a commercially used solvent; it's  
2 used and increasingly looked at in a number of  
3 production methodologies to be used as a  
4 solvent; isn't that correct?

5 A I don't know about beyond -- In oil and gas  
6 operations, it's used both as a pressure  
7 maintenance medium as well as a solvent in an  
8 EOR operation.

9 Q Now, when the SCCO<sub>2</sub> is being injected, the  
10 idea under -- using it as a mitigation  
11 strategy for the carbon waste stream from  
12 power plants, is it being injected into a  
13 large empty chasm?

14 A Are you referring to saline aquifer injection?

15 Q Yes.

16 A No, it's into the pore space of the reservoir,  
17 which is not a chasm. I think it denotes  
18 scale there; we think of the Grand Canyon or  
19 something like that. It's not a cave or a  
20 chasm; it's a small, microscopic pore system.

21 Q Right, and those pores, the microscopic pores,  
22 do they already have something else in them  
23 before the carbon is injected?

24 A Yes, all pores in the subsurface have  
25 something in them.

1 Q So, when you inject the SCCO<sub>2</sub>, when you inject  
2 the carbon waste into the ground, it has to  
3 displace something else that's under the  
4 ground.

5 A If you're referring to a saline aquifer,  
6 that's -- the name denotes the material that's  
7 in the pore space, and that's saline water,  
8 and so that saline water has to be displaced  
9 out of the pore system.

10 Q All right, and in enhanced oil recovery, it's  
11 displacing oil that's down there; right?

12 A It's a combination of water, oil and gas in  
13 EOR applications.

14 Q Now, in the case of the saline aquifer, is the  
15 saline liquid being displaced more or less  
16 volatile than the SCCO<sub>2</sub>?

17 A More or less volatile in a supercritical  
18 sense? We're at supercritical conditions, so  
19 there's -- nothing is volatile; we're in vapor  
20 phase --

21 Q Right, but if it were to migrate to the  
22 surface, would it be --

23 A If the salt water were to migrate to the  
24 surface, it would have to be elevated to 100 C  
25 to be volatile, to be a vapor.

1 Q All right, which would make it more or less  
2 volatile than the SCCO<sub>2</sub>?  
3 A In the reservoir?  
4 Q No, outside of the reservoir. We were talking  
5 about how it migrated to the surface, and then  
6 you gave me a temperature at which it became  
7 volatile at the surface --  
8 A Correct.  
9 Q -- and the question was: At that temperature,  
10 does that -- or at normal temperature on the  
11 surface, is it more volatile or less volatile  
12 than SCCO<sub>2</sub>?  
13 A Salt water versus supercritical CO<sub>2</sub>?  
14 Q That's correct.  
15 A If the CO<sub>2</sub> is supercritical by definition at  
16 the surface, it's still in liquid phase, so  
17 it's the same essentially as water.  
18 Q So, if it was released into the air, it would  
19 stay in liquid phase.  
20 A No. If it were released into the air, it  
21 would no longer be supercritical; it would be  
22 vapor phase.  
23 Q There we go, all right. Not that difficult.  
24 Now, would you agree that  
25 long-term storage of carbon waste in its

1       supercritical state should not be undertaken  
2       in an area where the hazards are unacceptable  
3       or technically or operationally unmanageable?

4    A   Yes.

5    Q   Are you aware of any manufacturing, commercial  
6       or industrial processes that were deemed to be  
7       acceptable or technically or operationally  
8       manageable where accidents occurred?

9    A   Am I aware of accidents occurring in  
10       industrial systems? What is this? Can you  
11       repeat the question?

12   Q   Okay. I'm trying to stick to the language  
13       from your testimony here to help phrase this  
14       question.

15               Are you aware of any commercial or  
16       industrial facilities or processes that were  
17       deemed acceptable and/or technically or  
18       operationally manageable where accidents  
19       occurred?

20   A   I'm certainly not an expert on industrial  
21       processes or operations, and I can't think of  
22       any off the top of my head where geological  
23       things were part of the system in which there  
24       was failure.

25   Q   Are you aware of any coal mines or injection

1 wells that were deemed acceptable or  
2 technically or operationally manageable at one  
3 point where later there was some sort of  
4 catastrophic failure?

5 A I'm not aware of the deeming of them being  
6 acceptable. I'm certainly aware of accidents  
7 that have happened in coal mines or gas  
8 storage fields that have had problems, but I  
9 don't know about the criterion by which they  
10 were deemed acceptable or not prior to that  
11 accident.

12 Q All right, but would you expect that most of  
13 those facilities when they were undertaken  
14 were deemed acceptable or technically or  
15 operationally manageable at the time they were  
16 undertaken?

17 A Again, because I'm a geologist, not an  
18 operations person, I can't comment on whether  
19 or not the proper protocols from an  
20 engineering and operations standpoint were  
21 followed or entered into the design of those  
22 relative to their subsequent history.

23 Q Well, you do suggest that sequestration, the  
24 long-term storage of carbon waste, should take  
25 place where it's technically or operationally

1       manageable, and I thought that was backed up  
2       by some engineering expertise that related to  
3       some way to understanding of what is  
4       operationally manageable or technically  
5       manageable or acceptable, or is it simply an  
6       assumption on your part that those would be  
7       the conditions?

8    A   The assumptions on my part and the  
9       conditions -- the understanding on my part  
10       when I made that statement was based on my  
11       understanding of how Class I, Class II and  
12       other classes of wells have operated in the  
13       past and how the design criterion have been  
14       used and followed for operating those  
15       facilities, and to my knowledge, the ones that  
16       I'm aware of have been designed appropriately  
17       and have operated well and without incident in  
18       our state.

19   Q   Have any of the one's operating -- Well, let  
20       me get back to your -- did you read -- are you  
21       familiar with Mr. Tombari's testimony?

22   A   Yes.

23   Q   All right, and I believe at one point he  
24       refers to storing 200 million tons of carbon.  
25       Does that sound vaguely familiar?



1 A Relative to what now?

2 Q As to what's necessary for a power plant over  
3 the life of the power plant.

4 A That is a -- one of the numbers that's cited,  
5 yes.

6 Q How many injection wells in Indiana are you  
7 familiar with that have stored  
8 200 million tons of SCCO2?

9 A I'm not aware of any.

10 Q Okay. How about 200 million tons of anything?

11 A I'm not aware of any.

12 Q All right. Now, in your testimony, you make  
13 reference to the April 18, 2008 earthquake,  
14 which was -- I believe the epicenter -- I'm  
15 looking at your testimony here at -- rebuttal  
16 testimony at Page 4, Lines 1 through 4. You  
17 indicate that the epicenter was about 20 miles  
18 southwest of Vincennes.

19 Do you know the general relative  
20 location of Edwardsport to Vincennes?

21 A Yes, I do.

22 Q About how far is that? In what direction?

23 A 25 miles east northeast.

24 Q Okay. I did a Map --

25 A Perhaps 30.

1 Q -- Quest. It only came up 19 miles, but I  
2 guess it depends where you count the city  
3 center to city center from. So, it's roughly  
4 about 40 miles from the epicenter of that  
5 earthquake.

6 A That's correct.

7 Q All right. Now, you indicate in your  
8 testimony -- I'm here looking at Page 5, Line  
9 3 and following, that the seismic hazard from  
10 a properly selected, implemented and managed  
11 carbon sequestration site would be low.

12 What if that site were not  
13 properly selected? Would the hazard still be  
14 low?

15 A No. The hazard is quantitatively depicted by  
16 the U.S.G.S. earthquake hazard maps, and those  
17 are a function of locations relative to  
18 intensity of seismicity in the past, so they  
19 are gradations of seismicity, and they are  
20 ranked as a probability of exceedence of  
21 ground motion.

22 Q Now, this has been a question I've been  
23 meaning to ask a geologist for years. Twenty  
24 years ago or so, I lived in Evansville, and  
25 there was a horse racetrack on the Indiana

1 side of the river that they said was located  
2 in Kentucky, and I could never figure that  
3 out, and somebody told me that's because the  
4 river changed boundaries due to an earthquake  
5 in the late 1800s. Do you know if that's an  
6 accurate --

7 A I don't know about that particularly, but I do  
8 know that the boundary between Indiana and  
9 Kentucky was established in about 1790 as the  
10 north edge of the Ohio River, and through  
11 time, through 200 years of natural migration  
12 of a river cutting off of meanders and the  
13 like, that that boundary has changed.

14 Q Now, do you remember at what depth the  
15 epicenter of that April, 2008 earthquake was?

16 A I am not aware exactly of that depth, but  
17 typically the earthquakes that happen in this  
18 portion of the nation are at depths of 10, 12,  
19 15 kilometers.

20 Q About how many miles would that be?

21 A Multiply it times three-and-a-half. I don't  
22 know, it's -- you know, it's 15 miles,  
23 18 miles, 20 miles.

24 Q I'm looking at a press release from -- it says  
25 I.U. investigates earthquake; said it was a

1 depth of 7.2 miles in the Wabash Valley  
2 Seismic Zone. Does that sound familiar?

3 A I'm not aware of the press release.

4 Q Did you study that seismic event?

5 A I did not, no.

6 Q Are you involved in those earthquake studies,  
7 or does that fall with somebody else?

8 A No. That's another discipline within geology.

9 Q All right. Looking at your testimony on  
10 page -- your rebuttal testimony on Page 6,  
11 Lines 3 through 8, you talk about numerous  
12 industrial processes in the region -- and I  
13 believe we've already covered this one --  
14 where you talk about them being significantly  
15 much more hazardous than CO2 sequestration  
16 that have been successfully engineered and  
17 operated to withstand the hazards of seismic  
18 activity in the region.

19 Are most of those injection wells  
20 at 1,080 psi or greater?

21 A I am not aware of the pressures that operate  
22 at those facilities if they have injection  
23 operations.

24 There is an injection well at GE's  
25 facility in Mt. Vernon, Indiana, which is not

1       very far from the refinery, which operates,  
2       I'm sure, at a significantly less pressure.  
3       I'm not aware of wells operating at the other  
4       facilities.

5   Q   All right, and, again, I think we covered this  
6       earlier, none of those wells have been  
7       injected with 200 million tons of whatever,  
8       waste or product?

9   A   I'm not aware of wells in the State of Indiana  
10      that have injected 200 million tons of  
11      anything.

12   Q   All right. On Page 6 of your testimony at  
13      Lines 14 through 15, you talk about the  
14      examination of the U.S.G.S. 2008 National  
15      Seismic Hazard Maps for the 2 percent  
16      Probability of Exceedence in 50 years.

17               Can you explain what the 2 percent  
18      Probability of Exceedence in 50 years means?

19   A   It means that there's a 2 percent probability  
20      that the ground motion will exceed in this  
21      case 30 percent of -- "g" is gravity there, so  
22      the acceleration due to gravity, if you  
23      measured in horizontal, would exceed  
24      30 percent of one "g" in a period of 50 years.  
25      That's a metric of ground motion type of

1 acceleration.

2 Q Okay. Have they done studies of 100 years,  
3 1,000 years, 10,000 years?

4 A They being the U.S.G.S.?

5 Q Yes.

6 A These earthquake hazard evaluations that  
7 they've done take into account all of the  
8 known historical seismicity that they can have  
9 any kind of records for, so it's as long as  
10 the historical record exists, which is several  
11 hundred years.

12 Q Maybe I watch The Discovery Channel too much,  
13 but they always have these geologists talk  
14 about what happened, you know, thousands of  
15 years ago and tens of thousands of years ago.  
16 I was just wondering if there was any way to  
17 know what magnitude earthquakes have taken  
18 place in that area, you know, 500 years ago,  
19 1,000 years ago.

20 A That area being the area inside the 30%g  
21 contour? That's a very specific geographic  
22 area on the map, and the short answer to that  
23 is there are different ways of looking at  
24 paleoseismicity and effects of things that are  
25 beyond the historical observed basis for

1       determining earthquake happenings.

2   Q   On Page 7, Lines 14 through 16 --

3   A   14 through 16?

4   Q   Lines 14 through 16, you talk about that  
5       portion of the injected CO2 that does return  
6       to the surface is separated from the oil and  
7       reinjected.

8                   Does that mean there's some  
9       cycling of CO2 --

10  A   Correct.

11  Q   -- that the same CO2 is injected and  
12       reinjected, and some portion stays behind?

13  A   Yes. Rule of thumb on that is 35 to  
14       40 percent stay in the ground on an EOR  
15       operation; therefore, 60 to 70 percent of it  
16       is coming back out with the oil that has to be  
17       then separated from the oil and reinjected.

18  Q   Okay, and does that next time through -- is  
19       that another 30 percent the next time through  
20       and then over and over again? How many times  
21       can you cycle CO2 through an EOR -- in an EOR  
22       process in a particular oil well or gas well  
23       to get oil and gas out of there?

24  A   The reservoir doesn't care how many times it  
25       sees a CO2 molecule. If you're having to make

1 up 40 percent of the CO2 that you're losing  
2 each time one of those cycles happens, you're  
3 adding material to that cycle, so it's not  
4 a -- it's a circumstance where you're adding  
5 CO2 to the system, 40 percent each cycle.

6 Q I am a little confused there. The first cycle  
7 through, you inject -- and let's use simple  
8 numbers because I can only handle simple math.  
9 Say --

10 A 100 million tons.

11 Q 100 million tons.

12 A Easy number to work with.

13 Q Okay.

14 A 40 million will stay in the reservoir. 60  
15 will come back untrapped with the oil.

16 Q Okay. The next time you cycle through, do you  
17 put in another 100 million tons?

18 A Yes, because the amount that you started with  
19 is diminished by 40 percent, so you are  
20 effectively sequestering 40 percent of the CO2  
21 you inject into the reservoir.

22 Q So, the next time through, if you -- would you  
23 be able to put in 100 million tons, or would  
24 you only be able to put in 60 million tons?

25 A Reservoirs are site specific; they're region



1       specific, so there's a point at which it's  
2       going to be diminishing returns on actually an  
3       EOR operation. Is it worth your while to  
4       continue to put CO2 in there to try and sweep  
5       oil at some point? The concept is that you  
6       stop trying to sweep oil and just put CO2 in,  
7       and then plug the wells out, and you sequester  
8       it by not cycling it or producing it back out,  
9       so there's more than just the simple dynamic  
10      of multiple cycles.

11    Q All right, and would they normally then inject  
12      CO2 in without wanting to get oil back out to  
13      cap it up? I mean, is that part of the normal  
14      EOR process, or do they take that CO2 and move  
15      on to the next well?

16    A That process then would be using the pore  
17      space that's been evacuated by the oil; that  
18      would be using a depleted oil field as a  
19      sequestration site. It's not an enhanced oil  
20      operation at that point.

21    Q Is that currently being done, or is that what  
22      is being proposed to be done?

23    A I'm not aware of that happening anywhere in  
24      the world.

25    Q All right. Now, on Page 8, Lines 9 through

1        11, you -- again, this is your rebuttal. You  
2        talk about "To avoid that situation, the  
3        hydrostatic or pressure of the fluid -- in  
4        this case, the SCCO<sub>2</sub> -- within the pore system  
5        of the reservoir must be maintained below that  
6        pressure exerted by the column of rock."

7                    Is it correct that the pressure of  
8        the column of rock needs to be more than  
9        roughly 1,080 psi to keep the carbon in its  
10       supercritical state?

11    A    Yes. The lithostatic load or the lithostatic  
12        pressure needs to be higher than 1,080;  
13        otherwise, the supercritical fluid will  
14        migrate through it.

15    Q    Do water and saline aquifers migrate? I mean,  
16        can one area of the aquifer be lower than  
17        another so that if you injected something that  
18        was heavier than saline, it might migrate  
19        downwards, or if it was lighter than saline,  
20        it might migrate uphill?

21    A    Now you're talking about the fluid that's  
22        moving into the reservoir displacing out the  
23        saline water?

24    Q    Yes.

25    A    Yes. Does the water get displaced? Is that

1 the question?

2 Q Yes.

3 A Yes.

4 Q And once it's there, if there's a difference  
5 in the mass or the weight of the two liquids,  
6 would one rise to the surface through the  
7 other one or migrate over distance if the  
8 aquifer is not level?

9 A Yes. The general pattern for CO<sub>2</sub> in a saline  
10 aquifer, because of the salinity and the  
11 density associated with that saline water  
12 relative to CO<sub>2</sub>, is that the CO<sub>2</sub> is buoyant,  
13 and, therefore, it would float atop the water  
14 inside the reservoir.

15 Q And where does the saline liquid migrate to  
16 when you inject?

17 A It migrates out away from the zone of  
18 injection.

19 Q If the liquid you're injecting is at the same  
20 pressure as the liquid that's already there,  
21 can you displace the liquid that's already  
22 there, or do you have to basically inject  
23 something at a higher pressure than the liquid  
24 that's already in the aquifer?

25 A The latter.

1 Q All right, and so that forces migration of the  
2 saline outward or upward or downward?

3 A Outward through the reservoir, latterly  
4 through the reservoir.

5 Q Are there parts where the reservoir comes to  
6 the surface or comes reasonably close to the  
7 surface?

8 A In most cases, in sedimentary rock systems,  
9 yes. Those sediments ultimately do come to  
10 the surface at some point.

11 Q What kind of volume is 200 million tons of  
12 supercritical carbon dioxide likely to take up  
13 in porous rock? Are we talking, you know,  
14 100 cubic miles, five cubic miles, 1,000 cubic  
15 miles?

16 A This was a fundamental question that you may  
17 have noted in my direct testimony in which I  
18 simulated, along with Mark Person, the large  
19 scale deployment of industrial scale,  
20 commercial scale sequestration sites  
21 throughout the Illinois Basin to see if there  
22 would be a displacement of the salt water  
23 updip into the fresh water portions or out  
24 through the outcrops.

25 It turned out that those were

1 quite small, surprisingly small. Both the  
2 pressure signature and the actual  
3 sequestration plume or the CO2 plume were  
4 relatively small compared to the scale of that  
5 aquifer system throughout the basin.

6 Q You're talking like throughout the whole Mt.  
7 Simon basin.

8 A I'm talking about throughout the Illinois  
9 Basin.

10 Q Illinois Basin. Is the saline aquifer  
11 contiguous throughout the entire basin  
12 consisting of the same character, the same  
13 type of rock under the same pressure and the  
14 same formations, or are there pockets where  
15 you might not find a saline aquifer at the  
16 same depth as you would, say, two miles away?

17 A You could see the physical geometry of that in  
18 my exhibits in the back of my direct  
19 testimony. It shows both the structural  
20 position or the underground topography of that  
21 horizon as well as the thickness, and there's  
22 variability in that horizon across the basin  
23 as well as characteristics of it. It's not as  
24 porous and permeable in some places as in  
25 others as well as there's a mixture of other

1 things beside quartz in it that make it a  
2 little bit variable from here to there. So,  
3 generally, it's a contiguous aquifer, but it  
4 has different "petrophysical" or different  
5 porosity and permeability characteristics.

6 Q Well, and, for example, at Edwardsport, it's  
7 not porous enough to support long-term storage  
8 of SCCO<sub>2</sub>, is it?

9 A Those are the results of the preliminary  
10 interpretation.

11 Q And there could be quite a few other areas  
12 like that as well?

13 A Our initial work indicates that at depths  
14 greater than about 7,500 feet throughout the  
15 basin, that the porosity decreases to  
16 substandard or less than commercial levels.

17 MR. POLK: I'm almost done here.  
18 Just a another moment.

19 Q Thank you, Mr. Rupp.

20 MR. POLK: I have no further  
21 questions, Your Honor.

22 JUDGE STORMS: Thank you. Ms.  
23 Becker?

24 MS. BECKER: No questions, Your  
25 Honor.

1 JUDGE STORMS: Mr. Stewart?

2 MR. STEWART: Thank you.

3

4 **CROSS-EXAMINATION OF MR. JOHN A. RUPP,**

5 **QUESTIONS BY MR. STEWART:**

6 Q Good afternoon.

7 A Good afternoon.

8 Q Mr. Rupp, I pulled out of the Technical  
9 Conference document one of your maps that  
10 showed the depths. It's a structure map on  
11 top of the Mt. Simon sandstone, and I think  
12 that's comparable to one of the maps with your  
13 testimony; is that correct?

14 A Yes, that's correct. It's a little more  
15 refined and of a slightly different vintage, I  
16 think, but, generally, the patterns are the  
17 same.

18 Q Is it correct -- if you look at Page 9 of your  
19 testimony --

20 A 9 of my direct testimony?

21 Q Yes, and first of all, could you identify for  
22 the others here which map attached to your  
23 testimony this would correspond to? If I need  
24 to show this to you, I would be glad to do so.  
25 It's the August, 2009 Indiana Geological

1 Survey map.

2 A If you're holding up a structure map, it would  
3 be F-5, Petitioner's Exhibit F-5.

4 Q Thank you, and on Page 9, you indicate that  
5 the depth for carbon sequestration likely to  
6 occur -- I'm looking at Lines 13 to 14 -- I  
7 guess the preferred depths are between 2,500  
8 and 7,000 feet; is that correct?

9 A Between 2,500 and 7,000 feet is correct, yes.

10 Q Okay, and if you look at the map, is it  
11 correct that between 2,500 and 7,000 feet is  
12 pretty much -- you cut down at an angle on the  
13 southwest corner of Indiana or cut the boot or  
14 the point off, and then you basically go north  
15 and east from there through a good part of the  
16 state, and that's where that would be?

17 A That's a fair interpretation, yes. It's a  
18 tabular body of rock that's dipping down to  
19 the southwest and up to the northeast at a  
20 point at which it goes below about 7,500 feet  
21 or 7,000 feet. It's southwest of Knox County.

22 Q Remind me where Knox County is.

23 A Knox County is where Edwardsport is.  
24 Vincennes is the county seat. It's the  
25 largest county in southwest Indiana on the



1       Wabash River, kind of an incline trapezoid.

2   Q   Well, wouldn't it be northeast of there?

3   A   Northeast of there, it's less than 7,500 or  
4       7,000. It's inclined deeper to the southwest,  
5       shallower to the southeast.

6   Q   Yes, okay. So, you wouldn't be going  
7       southwest to try and find a spot?

8   A   No.

9   Q   Okay. On Page 18 at the top there carrying  
10       over from the other page, can you explain to  
11       me what it means here where it says the  
12       possibility of some storage volumes throughout  
13       the state, but the west and southwest have the  
14       concentration of high volume targets?

15  A   Yes. I'm talking about the entire  
16       stratigraphic column, the whole package of  
17       rock units that lie in our state, and bearing  
18       in mind that for supercritical, high density  
19       CO2 sequestration, you want to be below  
20       2,500 feet, and knowing that as we saw in the  
21       structure map on F-5, that those sediments --  
22       that package of sediments gets deeper and  
23       deeper as you go to the southwest. There's  
24       more of them preserved in the west and  
25       southwest portion of the State, so there's

1 more options for sequestration targets in that  
2 part of the state than northeast of there.

3 Q Okay. I thought that we just heard that the  
4 targets are northeast of Edwardsport, and I  
5 thought I just heard you say that the  
6 southwest is where the targets are.

7 A Previously, we were only talking about the Mt.  
8 Simon sandstone. That was a structure map on  
9 Mt. Simon. We were talking about the fabric  
10 or the porosity in the Mt. Simon only.

11 This series of sentences talks  
12 about other reservoirs that are not -- that  
13 don't include the Mt. Simon. Those would be  
14 the other reservoirs.

15 Q Other saline aquifers?

16 A Yes.

17 Q None of those are being explored as part of  
18 this plan, are they?

19 A Yes. There will be three other zones intended  
20 for evaluation in this plan.

21 Q I thought that the zone was 50 miles in a  
22 semi-circle north of Edwardsport.

23 A Yes. If you look at David Julius' exhibit,  
24 there's a picture of that semi-circle in  
25 there, and you put a 50-mile radius on it and

1 swing it out from Edwardsport and look within  
2 that half circle, there are three reservoirs  
3 that are going to be evaluated in that circle,  
4 half circle.

5 Q Okay. Now, Mr. Polk asked you I think at the  
6 bottom of 23 and the top of 24 -- perhaps he  
7 referenced another place -- where it said  
8 should residents be concerned about having  
9 millions of tons of carbon dioxide under high  
10 pressure stored thousands of feet below their  
11 property. Do you recall that?

12 A This is on 23 and 24 of the direct testimony?

13 Q 22 and 23, I'm sorry.

14 A 22 and 23. Yes, I recall the question.

15 Q Now, he asked you how much area  
16 200 million tons of supercritical carbon  
17 dioxide would take. I don't think I heard an  
18 answer. Are you able to answer that?

19 A I can give you a rule of thumb, and it's only  
20 that. It's not one that applies everywhere,  
21 but it takes into account an average of very  
22 thick and very porous zones and less thick and  
23 less porous ones, and a rule of thumb is a  
24 million tons per square mile, so 200 million  
25 tons, 200 hundred square miles. Could be

1 smaller, could be larger depending on the  
2 thickness and the quality of reservoir, but a  
3 rule of thumb to calculate with, and only  
4 that, is roughly a square mile per million  
5 tons.

6 Q Now, how deep is the saline aquifer in terms  
7 of miles?

8 A Well, it would be greater than 2,500 feet  
9 which is greater than a half a mile, and --

10 Q Well, that's the depth to get to where you  
11 would want it to be at least that deep.

12 A Right.

13 Q And then you wouldn't want it to be more than  
14 7,000?

15 A Correct.

16 Q Well, how deep -- how thick is that aquifer as  
17 it flows through all those stages that we've  
18 talked about on this map?

19 A Different aquifers are of different  
20 thicknesses, so if you want to talk about the  
21 Mt. Simon, we can go to the thickness map of  
22 the Mt. Simon --

23 Q Yes.

24 A -- and that would be F-6, I believe. Yes, F-6  
25 is the thickness map of the Mt. Simon, so one

1       can see from that map that it ranges in  
2       thickness from over 2,500 feet or almost 3,000  
3       feet in north central Illinois to less than  
4       1,000 down to several hundred feet in the  
5       regions outside of that depocenter.

6   Q   So, is that less than a mile thick?

7   A   Well, 5,280 feet is a mile, so 2,500 feet is  
8       about a half a mile thick.

9   Q   That's the thickness of it?

10  A   The thickness of it, correct.

11  Q   So, if you had 200 square miles at the  
12       thickest location, then that would actually  
13       take 400 square miles of surface area?

14  A   Bear in mind, when I gave you the rule of  
15       thumb, it was purely that, a rule of thumb.  
16       It did not take account -- it averaged  
17       thickness, and it averaged depth, so if one  
18       wanted to make an actual calculation at an  
19       area where, for example, the Mt. Simon was  
20       2,500 feet thick, one would have to look at  
21       the amount of porosity, the depth and make  
22       that calculation. It could be that you could  
23       put three million tons per square mile in an  
24       area of that thickness. So, when one makes a  
25       calculation about how much can be stored per

1 square mile or per acre or whatever, you have  
2 to bear in mind the thickness.

3 Q Well, you gave me a rule of thumb, and I  
4 suppose if you could put three million in, you  
5 could have places -- and let's take, for  
6 example, Edwardsport, where you couldn't put  
7 very much in at all, so that's why you have a  
8 rule of thumb; right?

9 A Correct.

10 Q So, with your rule of thumb, if I take a half  
11 a mile thick, and I need 200 square miles,  
12 that would cause me to double the surface  
13 area, wouldn't it?

14 A No, the rule of thumb does not take into  
15 account the best or the thickest part of the  
16 reservoir. I think that's where it's not  
17 working well. You would have to take an  
18 average of, say, 1,000 or 800 feet thick to  
19 make a meaningful extrapolation like that.

20 Q Okay. Well, that would make a -- you would  
21 need even more space, then?

22 A Each area -- this is -- one of the fundamental  
23 purposes of the study is to evaluate how much  
24 volume and what the character of the volume  
25 would be over what area for a reservoir to be

1       able to handle the amount of CO2 that's  
2       planned.

3   Q   I understand that, but I took the 2,500 feet  
4       because that was the thickest that you told  
5       me --

6   A   Yes.

7   Q   -- and if you make it thinner, then you have  
8       to have even a greater area of expanse for the  
9       CO2, don't you?

10  A   Then the 200 --

11  Q   All other things held equal?

12  A   Yes, the thinner, the larger area, that's  
13       correct, yes.

14  Q   Okay. Now, on Page 25, you reference the  
15       Indiana Geological Survey --

16  A   Yes.

17  Q   -- and how is it connected to Indiana  
18       University?

19  A   The Geological Survey is a research institute  
20       of the Indiana University.

21  Q   And is it a not-for-profit?

22  A   Yes.

23  Q   And what is its source of funding?

24  A   It's split between a line item that handles  
25       about -- a little less than half of the budget

1 comes from the state through the University's  
2 budget, and about a little more than half is  
3 soft money, external contracts.

4 Q And so that would be -- For example, you  
5 reference the Indiana Geological Survey has  
6 performed -- on Page 25 --

7 A Yes.

8 Q -- ongoing technical expertise for Duke. As  
9 an example, that would be soft money? I'm  
10 looking at Lines 13 and 14.

11 A Yes. "The IGS has provided ongoing technical  
12 expertise to Duke Energy Indiana as they have  
13 begun to consider the possibility of  
14 evaluating the subsurface for carbon  
15 sequestration in the vicinity. . ." That work  
16 was done in conjunction with the MGSC, the  
17 Midwest Geological Sequestration Consortium,  
18 which is one of those soft money, DOE-funded  
19 regional partnerships that we're part of.

20 Q The next sentence says the IGS did a carbon  
21 sequestration feasibility study for Duke.

22 A Yes.

23 Q Is that the same thing you were just talking  
24 about?

25 A Yes.



1 Q Okay. Has Duke itself engaged the Geological  
2 Survey in the sense that Duke compensated the  
3 Geological Survey?

4 A No.

5 Q Okay. Now, on the next page, you indicate  
6 that the survey -- its work is carried out --  
7 I'm looking at Line 4 -- the primary aspects  
8 include objectivity; correct?

9 A Yes.

10 Q Okay, and staff of the IGS can't endorse or  
11 condemn concepts or projects.

12 A That's correct.

13 Q Does that mean that if someone proposed to do  
14 something in the State of Indiana underground  
15 that the staff at the IGS thought could lead  
16 to terrible, terrible consequences, that it  
17 would be prohibited from speaking about that?

18 A I wouldn't interpret it that way. I see that  
19 fundamentally as our choice to not take an  
20 advocacy position with any project either for  
21 or against it.

22 Q Now, in this particular case and your  
23 testimony here that we've just looked at is  
24 not provided on behalf of the Indiana  
25 Geological Survey.

1 A That's correct.

2 Q In fact, it's provided by John Rupp  
3 Consulting?

4 A That's correct, yes.

5 Q So, John Rupp Consulting is who Duke would  
6 compensate for the testimony?

7 A That's correct.

8 Q Okay. Did the IGS have to review and sign off  
9 on your testimony?

10 A My director is aware of my testimony and has  
11 seen it and is endorsing my participation in  
12 this project.

13 Q Okay. What --

14 A Additionally --

15 Q Excuse me, go ahead. I apologize.

16 A Additionally, we have an ongoing relationship  
17 with Duke and many other people that ask  
18 fundamental questions about the geology and  
19 the applicability of concepts that they have,  
20 so it's -- there's a lot of interactivity. In  
21 fact, the history of the Geological Survey has  
22 always been one of interacting with industry  
23 to provide them technical geological  
24 information.

25 Q And they typically don't compensate the Survey

1       for that?

2    A   I'm not sure typically is -- I mean, if it's  
3       general, if it's a relatively small volume, if  
4       it doesn't cost a lot of staff hours, if it  
5       doesn't cost a lot of product, at some point,  
6       it breaks over into we have to recover costs,  
7       but much of the time not.

8    Q   Well, you indicated that slightly more than  
9       half comes from other sources other than the  
10       state; that's why I was curious.

11   A   Yes.

12   Q   Are those usually federal grants?

13   A   Those are a combination of federal and state  
14       contracts.

15   Q   Now, I was curious by something you just said,  
16       and that's why I was going to stop you because  
17       I didn't want to forget it, but it says here  
18       the staff can't endorse or condemn certain  
19       projects, and then we're going to get to your  
20       answer at the bottom of Page 26, but I was  
21       struck by the suggestion that you made that  
22       your supervisor at IGS was endorsing --

23   A   I'm sorry.  If I said endorsement, it was a  
24       mistake.  I meant to say that he endorsed my  
25       collaboration with Duke, not the project.  If

1 I meant to imply the project, that was wrong.

2 Q Does that mean that he, generally speaking,  
3 authorized you to do it?

4 A Oh, yes.

5 Q All right. Now, at bottom of Page 26, you  
6 were asked if Duke Energy's carbon storage  
7 plan seems reasonable to you, and your  
8 response is "Yes, very much so." Do you see  
9 that?

10 A Yes.

11 Q And then in the next sentence, you say "The  
12 investment necessary to carry out a reasonably  
13 sound exploration and development program such  
14 as outlined is not trivial but will be  
15 worthwhile as the risks are substantially  
16 reduced when such a program is carried out  
17 completely and comprehensively as outlined in  
18 the plan." That's your testimony?

19 A Yes.

20 Q Now, do you not consider that an endorsement  
21 of Duke's plan?

22 A No. The functional word there is reasonable,  
23 and reason is to look at the evidence, look at  
24 the technical aspects of the evidence and  
25 judge whether or not that is a well-reasoned

1 plan as opposed to one that advocacy can be  
2 without technical merit or an understanding of  
3 rational or reasonable parts of it, but that  
4 comment there is designed to talk about the  
5 components of an exploration and development  
6 program and what is a rational composition of  
7 the program, not whether or not it's a good  
8 thing or a bad thing. It doesn't have a value  
9 judgment; it's just the functionality of it or  
10 not.

11 Q Well, then, if a company other than Duke had  
12 come to you and wanted to establish a carbon  
13 sequestration business in Indiana, would you  
14 have advised them that it was reasonable to  
15 undertake the same type of plan that Duke has  
16 proposed here?

17 A If they had offered a plan that had the  
18 composition and the metrics and the mileposts  
19 that were similar to the one that has been  
20 proposed by Duke, we would work with them to  
21 give them the site-specific information so  
22 that they could carry that plan forth.

23 Q And so you're saying that it's reasonable  
24 here. You would have given Duke that very  
25 same answer and provided this very same

1 testimony before the Commission if Duke had  
2 come here and said we want to do this, and  
3 we're going to pay for it. We're not asking  
4 the ratepayers to pay for it, but we're going  
5 to pay for it. Your testimony would be  
6 exactly the same, wouldn't it?

7 A If I understand your question correctly, yes.  
8 It's not based on who's paying.

9 MR. STEWART: Thank you very much.  
10 No further questions.

11 JUDGE STORMS: Mr. Tolliver, your  
12 witness.

13 MR. TOLLIVER: Thank you, Your  
14 Honor.

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1     **CROSS-EXAMINATION OF MR. JOHN A. RUPP,**

2             **QUESTIONS BY MR. TOLLIVER:**

3     Q   Mr. Rupp, good afternoon.

4     A   Good afternoon.

5     Q   I didn't have an opportunity to look around  
6         this morning, but have you been in the hearing  
7         for most if not all day?

8     A   Today, have I been in the hearing?

9     Q   Yes.

10    A   Yes.

11   Q   You may have heard that there's an awful lot  
12       of benefits associated with this study; it may  
13       not only benefit Duke Indiana's ratepayers,  
14       but it can benefit the state or it could  
15       conceivably benefit the nation or the world.

16                 Do you know -- is there any  
17       commercial value to those benefits?

18   A   The benefits that could come out of this  
19       specific plan, which is a geologically and  
20       geographically specific plan, are relative to  
21       that area, so there may be some operational  
22       and procedural things that would be refined or  
23       potentially enhanced upon that are different  
24       from one, say, going in Australia or in the  
25       North Sea of Norway, but the specific plan is

1 a geological and geographically specific one,  
2 so the value of it is only good in that area;  
3 the fundamental value is only good in that  
4 area.

5 Q And that area is, I guess, limited to the  
6 50 miles around Edwardsport?

7 A That's correct, as well as the 150-mile radius  
8 for the EOR evaluation.

9 Q And just for my own benefit, you've done a lot  
10 of this work for others whether through the  
11 Indiana Geological Survey or as an independent  
12 consultant.

13 Who typically owns the research?  
14 Is it you or the IGS as the researcher, or is  
15 it the client?

16 A Which research are you referring to?

17 Q Just research in general. In the past, when  
18 you've done research for private entities --

19 A Well, if I was doing business as myself for  
20 another company, then they own the research.  
21 If I was doing business with the Survey, then  
22 it's public domain.

23 Q And when you're doing research for the --  
24 Well, let me rephrase that.

25 If you -- if the Indiana



1 Geological Survey does research on behalf of a  
2 company, the IGS retains ownership of the  
3 research?

4 A It's ultimately in the public domain.

5 Q Okay, and then if you do research  
6 independently, the client that compensates you  
7 owns that research?

8 A That's correct.

9 Q Okay, and in this particular case, you are  
10 acting as John Rupp -- on behalf of John Rupp  
11 Consulting in this particular case?

12 A The preparation of the testimony for this  
13 particular hearing I did because of the amount  
14 of time and effort involved in it. I did it  
15 as a consultant for Duke. All of the other  
16 work that we've done for Duke has been either  
17 gratis or part of the MGSC.

18 Q Okay, and which specific entity did you enter  
19 into -- or did John Rupp Consulting enter into  
20 a contract with?

21 A Duke Energy Indiana.

22 MR. TOLLIVER: We have no further  
23 questions, Your Honor. Thank you.

24 JUDGE STORMS: Redirect for this  
25 witness?

1                   MR. DuMOND: No redirect, Your  
2 Honor.

3                   JUDGE STORMS: Okay. Commissioner  
4 Ziegner?

5

6 **QUESTION OF MR. JOHN A. RUPP,**

7 **BY COMMISSIONER ZIEGNER:**

8 Q Just one question, Mr. Rupp -- well, depending  
9 on your answer, I guess.

10                   Are there locations in the State  
11 of Indiana that are outside of the 50-mile  
12 study zone that are potential saline sites for  
13 storage?

14 A Yes, certainly that's the case, yes. There  
15 are numerous sites outside of that 50-mile  
16 both to the southwest, as we were talking  
17 earlier, the shallower horizons, shallower  
18 than Mt. Simon, or deeper horizons further to  
19 the north and to the east.

20                   Generally, there's a zone from  
21 northwest to southeast across the state where  
22 the rocks are the shallowest, and those are  
23 probably some areas where the least potential  
24 is present, but, otherwise, there is potential  
25 outside of that, yes.

1 COMMISSIONER ZIEGNER: Thank you.

2 Nothing further.

3 JUDGE STORMS: Mr. Rupp, thank you  
4 very much for your testimony. You are  
5 excused.

6 MR. HELMEN: Your Honor, I would  
7 like to apologize to the Commission and all of  
8 the parties for jinxing that whole moving  
9 along thing.

10 JUDGE STORMS: Yes. You really  
11 can't say that. It doesn't work; I've tried  
12 it. You can make it up to us, though, Randy.

13

14

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18

19 (WITNESS JOHN A. RUPP EXCUSED ON

20 DIRECT AND REBUTTAL)

21

22

23

24

25

1 JUDGE STORMS: Petitioner, you may  
2 call your next witness.

3 MS. KARN: Thank you, Your Honor.  
4 Petitioner calls Diana Douglas.

5

6 **DIANA L. DOUGLAS**, a witness appearing on behalf  
7 of the Petitioner, having been  
8 first duly sworn, testified on  
9 Direct and Rebuttal as follows:

10

11 **DIRECT EXAMINATION,**

12 **QUESTIONS BY MS. KARN:**

13 Q Good afternoon. Could you please state your  
14 name for the record?

15 A Yes, my name is Diana L. Douglas.

16 Q By whom are you employed and in what capacity?

17 A I'm employed by Duke Energy Business Services  
18 as Director of Rates.

19 Q Do you have a document before you that has  
20 been marked for identification purposes as  
21 Petitioner's Exhibit G including Sub-Exhibits  
22 G-1 through G-5?

23 A Yes, I do.

24 Q Do you have any changes or updates to make to  
25 that testimony?

1 A I do have an update.

2 On Page 11, I have a question  
3 regarding the accounting treatment proposed by  
4 the company and whether it's in accordance  
5 with Generally Accepted Accounting Principles,  
6 and although the answer is still true, the  
7 accounting -- the Financial Accounting  
8 Standards Board that regulates accounting  
9 rules has codified the accounting rules and  
10 now has a different nomenclature and has kind  
11 of organized the rules differently.

12 The rules are still the same, and  
13 they have not changed, but how they are  
14 referred to has changed, so in my rebuttal  
15 testimony, I have this same question at the  
16 bottom of Page 5, and I use the new references  
17 there, and we should consider those references  
18 to be the case in place of this question at  
19 the bottom of Page 11 in the direct testimony.

20 Q Okay, thank you.

21 Given that clarification, if I  
22 were to ask you the same questions contained  
23 in Petitioner's Exhibit G today, would your  
24 answers be the same?

25 A Yes, they would, although we changed our

1 proposed ratemaking treatment between direct  
2 and rebuttal.

3 Q Okay, thank you.

4 Do you adopt Petitioner's Exhibit  
5 G including Sub-Exhibits G-1 through G-5 as  
6 your sworn testimony in this cause?

7 A Yes, I do.

8 Q Okay.

9 MS. KARN: Your Honor, I would  
10 like to enter into evidence Petitioner's  
11 Exhibit G and Sub-Exhibits G-1 through G-5.

12 JUDGE STORMS: Is there any  
13 objection?

14 MR. HELMEN: Your Honor, it's  
15 unclear to me whether -- was she orally  
16 amending her direct testimony?

17 MS. KARN: I guess I would call it  
18 more of just a clarification. I mean, both  
19 her direct and her rebuttal testimony will be  
20 in evidence, and so it was just kind of  
21 referring to -- the proper nomenclature is the  
22 one in the Q & A contained in the rebuttal as  
23 opposed to the direct, so --

24 MR. HELMEN: Okay. No objection.

25 JUDGE STORMS: Okay. We'll show

1       Petitioner's Exhibit G with Sub-Exhibits G-1  
2       through G-5 admitted into this cause.

3

4                       (PETITIONER'S EXHIBIT NO. G, BEING  
5                       THE PREFILED DIRECT TESTIMONY OF  
6                       MS. DIANA L. DOUGLAS, WITH  
7                       PETITIONER'S EXHIBIT NOS. G-1  
8                       THROUGH AND INCLUDING G-5 ATTACHED  
9                       THERE TO, ADMITTED INTO EVIDENCE.)

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1     **DIRECT EXAMINATION OF MS. DIANA L. DOUGLAS,**

2             **(Continuing)**

3             **QUESTIONS BY MS. KARN: (Continuing)**

4     Q   Do you also have before you a document that's  
5         been marked for identification purposes as  
6         Petitioner's Exhibit M?

7     A   Yes, I do.

8     Q   Is that a copy of your prefiled rebuttal  
9         testimony in this cause?

10    A   Yes, it is.

11    Q   Do you have any changes or corrections to that  
12         testimony?

13    A   No, I do not.

14    Q   If I were to ask you the same questions today,  
15         would your answers be the same?

16    A   Yes, they would.

17    Q   And do you adopt Petitioner's Exhibit M as  
18         your sworn rebuttal testimony in this cause?

19    A   Yes, I do.

20                     MS. KARN: Your Honor, Petitioner  
21         would offer into evidence Petitioner's Exhibit  
22         M, the rebuttal testimony of Diana Douglas.

23                     JUDGE STORMS: If there's no  
24         objection, we'll show Petitioner's rebuttal  
25         Exhibit M admitted into this cause.



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MS. KARN: Thank you, Your Honor.

(PETITIONER'S EXHIBIT NO. M, BEING  
THE PREFILED REBUTTAL TESTIMONY OF  
MS. DIANA L. DOUGLAS, ADMITTED  
INTO EVIDENCE.)

1 MS. KARN: The witness is  
2 available for cross.

3 JUDGE STORMS: Mr. Hartley?

4 MR. HARTLEY: No questions, Your  
5 Honor.

6 JUDGE STORMS: Mr. Polk?

7 MR. POLK: No questions, Your  
8 Honor.

9 JUDGE STORMS: Ms. Becker?

10 MS. BECKER: No questions, Your  
11 Honor.

12 JUDGE STORMS: Mr. Stewart?  
13

14 **CROSS-EXAMINATION OF MS. DIANA L. DOUGLAS,**

15 **QUESTIONS BY MR. STEWART:**

16 Q Good afternoon.

17 A Good afternoon.

18 Q I want to follow up on some deferrals, meaning  
19 from other people to you, not into the rates  
20 of our clients in the future. Thank you; I  
21 just came up with that.

22 Okay. On Page 5 of your direct  
23 testimony and then again -- I'm sure it's in  
24 your rebuttal as well, but at Lines 18 and 19,  
25 you're talking about getting funding from the

1 federal government net of costs to comply with  
2 the grant rules and regulations.

3 Are you in a better position to  
4 tell me what you're going to be taking away  
5 from us?

6 A When we use this terminology, we're talking  
7 about incremental costs that the company may  
8 need to incur in order to comply with the  
9 requirements of the Department of Energy  
10 grants.

11 It could be such things as having  
12 to pay a prevailing wage under the Davis Bacon  
13 laws, which would be a cost that was not  
14 included in the 121 million estimate, so it's  
15 an incremental cost to the company that is  
16 only due to taking the federal funds. So, the  
17 grant that we would receive would be net of  
18 that incremental cost.

19 Q Well, I could see where that one would just  
20 flow through either in a rate case or in a  
21 project cost that's being capitalized; that  
22 would just be part of the cost of the project,  
23 wouldn't it?

24 A It will have the net effect of being in the  
25 project cost and having all of the DOE funds

1 credited, but the net amount or the adjustment  
2 to the originally estimated project cost will  
3 be that net amount because you'll have the  
4 incremental cost, and then you'll have the DOE  
5 funds that we received.

6 Q Well, we face that risk just in the prospect  
7 that you could have significantly  
8 underestimated the cost of this project  
9 anyway, don't we? I mean, wouldn't that just  
10 reduce the value of the grant to us as well?

11 A These costs are just -- these are specific to  
12 the grants. They are extra costs that have  
13 nothing to do really with the project. The  
14 25 percent contingency that Mr. Moreland  
15 included are costs that are related to the  
16 project. This is costs related to obtaining  
17 the DOE grants, so there's a little bit of a  
18 distinction there. They both may end up being  
19 capitalized to a project, but it's two  
20 different types of costs.

21 Q Okay. Can you provide me with any other  
22 example other than prevailing wage?

23 A That's probably the best example, but there's  
24 some reporting requirements. I'm not sure  
25 what all might be involved, but, you know,

1       potentially, we could have incremental costs  
2       for printing. There may be meetings that are  
3       required to meet with the Department of Energy  
4       to discuss where we are, so those types of  
5       incremental costs.

6   Q   Who would be in those meetings?

7   A   I would assume Ms. Radcliffe and --

8   Q   Who does she work for?

9   A   Duke Energy Business Services, I believe.

10   Q   Don't we have an allocation of costs on Duke  
11       Energy Services already being paid for by  
12       ratepayers?

13   A   Well, I didn't say Ms. Radcliffe's salary  
14       would be included. I said any incremental  
15       costs that might be included. I don't know  
16       where Ms. Radcliffe's costs were budgeted and  
17       whether that's in O&M and base rates or not.  
18       If it were, we certainly would not include it  
19       again as an incremental cost because it  
20       wouldn't be incremental.

21   Q   Well, you've lost me there because surely  
22       you're not going to go back and say, well,  
23       these five people went to a meeting; those two  
24       people were in existence at the time of our  
25       last rate case, and part of their cost was

1 allocated to Indiana, and these three people  
2 are new, so we're going to charge the Indiana  
3 ratepayers for their expenses. Is that  
4 actually what you're proposing?

5 A Well, that's not what I said. You're trying  
6 to pin me down to too much detail, but if  
7 there are incremental costs, they would be  
8 netted against the grant.

9 I gave you an example, and maybe  
10 it wasn't a good one, of travel for a meeting  
11 and of Ms. Radcliffe being involved, but we  
12 would evaluate any incremental costs that we  
13 have, and if they are truly incremental, they  
14 would be netted against the DOE funding. If  
15 they are not incremental, they wouldn't.

16 Q Okay. Well, you're saying that I'm trying to  
17 pin you down to details. You are the Director  
18 of Rates employed by Duke Energy Business  
19 Services, LLC; correct?

20 A Yes, I am, but I haven't been involved in the  
21 team that is working on the CCPI Round 3  
22 application, and I'm not familiar with all of  
23 the requirements and what that team might  
24 expect the incremental cost to be.

25 Q How much cost have you already identified as

1 incremental costs that you would deduct from a  
2 grant as we sit here today on the work that's  
3 been done on this project?

4 A Well, the one that I know that has been talked  
5 about is the Davis Bacon prevailing wage  
6 requirements.

7 Q So, up to now, everything that's been done,  
8 there aren't any incremental costs that have  
9 been identified other than the possibility of  
10 the Davis Bacon?

11 A That's the only one that's been identified to  
12 me.

13 Q And how do you track incremental costs with  
14 respect to matters that you discussed like  
15 with Ms. Radcliffe's travel?

16 A We would decide -- the accounting group would  
17 set up some special codes that people would  
18 charge, and they would be instructed to charge  
19 those codes when they incurred an incremental  
20 cost.

21 At this point, I'm not aware that  
22 we have -- because we have not yet received a  
23 Department of Energy grant, I'm not aware that  
24 any special codes have been set up to track  
25 these costs.

1 Q Are indirect -- would your incremental costs,  
2 as you're referring to it here, be in the  
3 indirect and allocated overheads?

4 A No, I don't believe they would be. Those  
5 indirect and allocated overheads are generally  
6 engineering costs of engineers that are  
7 supporting projects and supervision and  
8 management of those engineers, and those  
9 employees generally charge their time to  
10 capital projects or a pool of a capital  
11 project that gets spread to multiple capital  
12 projects as overheads.

13 Q And those are Duke engineers?

14 A Yes, and it could be some outside consultants,  
15 but, generally, it's Duke employees that are  
16 in the indirect overhead pools.

17 Q And if it doesn't result in a project, how  
18 would those costs be allocated?

19 A If what doesn't result in a project?

20 Q If this study of carbon sequestration doesn't  
21 result in a project, how would those costs be  
22 allocated?

23 A At the time that a decision is made that no  
24 project will result, those costs would be  
25 expensed.



1 Q And has somebody gone and tried -- would  
2 somebody be going back and analyzing whether  
3 costs associated with the engineers are  
4 already included in rates?

5 A Somebody has already done that. The engineers  
6 are instructed to -- they're either an O&M  
7 type engineer or they're a capital engineer,  
8 and if they're capital, they are charging a  
9 construction overhead pool account whenever  
10 they're not working on a direct project.

11 If they're working on a direct  
12 project, whether it be a capital project or it  
13 be a study like this, a preliminary  
14 engineering and survey study, they charge  
15 specific accounting codes that track their  
16 time in that bucket of costs.

17 Q Okay, and Duke has asked for the Indiana  
18 ratepayers to fund, if you will, ballpark \$121  
19 million to study carbon sequestration that may  
20 or may not result in a project, and on top of  
21 that, if somebody from your staff needs to go  
22 to Washington to meet with DOE, you would add  
23 that on to us and have us pay their hotel room  
24 and their travel and those costs as well; is  
25 that right?

1 A You would also be credited for any DOE funds  
2 that we receive for the project as well.

3 Q That doesn't answer my question.

4 A The incremental costs to receive the DOE funds  
5 would be netted against the DOE funds that we  
6 receive.

7 Q Now, in your rebuttal testimony on Page 3 at  
8 Line 13, you say ". . .we are willing to forgo  
9 cash recovery of financing costs via our  
10 originally proposed Carbon Management  
11 Rider. . ." Do you see that?

12 A Yes.

13 Q Do you really mean that you're willing to  
14 forego requesting approval of the Commission  
15 because you don't have that right now, do you?

16 A We don't have what? I don't understand the  
17 question.

18 Q Well, you can't forego something that you  
19 don't have, can you? You can forego the  
20 opportunity to ask for it, but you aren't  
21 foregoing cash recovery because you haven't  
22 been authorized to get cash recovery.

23 A No, we have not been authorized to get cash  
24 recovery, but we requested it originally. Now  
25 we have changed our mind, and we have said we

1 do not need cash recovery of the financing  
2 costs.

3 MR. STEWART: Thank you. I have  
4 nothing else.

5 JUDGE STORMS: Mr. Helmen, your  
6 witness.

7 MR. HELMEN: Thank you, Your  
8 Honor.

9

10 **CROSS-EXAMINATION OF MS. DIANA L. DOUGLAS,**

11 **QUESTIONS BY MR. HELMEN:**

12 Q Good afternoon, Ms. Douglas.

13 A Good afternoon.

14 Q All right. That's a great place to --  
15 Mr. Stewart ended right where I wanted to pick  
16 up. In fact, if you go to Page 3 of your  
17 rebuttal testimony --

18 A I'm there; what line?

19 Q Line 15.

20 A Okay.

21 Q And I guess the point that -- I want to direct  
22 you to that area of your testimony, but the  
23 point is that you're seeking -- you are now  
24 seeking a deferral of the study costs for  
25 subsequent recovery with carrying costs equal

1 to Duke's AFUDC rates until such time as those  
2 costs are included in rates. Did I say that  
3 correctly?

4 A Yes.

5 Q And, presumably, the time that they are  
6 included in rates will be in your next base  
7 rate case?

8 A Or the next base rate case following the  
9 incurrence of the costs.

10 Q Okay, very good.

11 Now, do you know any of the  
12 statutes or rules that you rely upon in  
13 seeking these carrying costs? Is there -- is  
14 the concept of carrying costs or the words  
15 carrying costs or charges used in any of those  
16 statutes?

17 A I don't believe so. The concept of carrying  
18 costs has been -- or carrying costs have  
19 previously been approved for the carbon  
20 capture FEED study as an incentive --

21 Q But there's no --

22 A -- by the Commission.

23 Q Excuse me; I'm sorry, but there's no  
24 suggestion in any of those rules or laws that  
25 an AFUDC rate or any similar type rate should

1       be applied to this deferred cost, is there?

2   A   Not directly that I'm aware of.

3   Q   Now, AFUDC, that stands for allowance for  
4       funds used for construction. Do I have that  
5       right?

6   A   Yes.

7   Q   Okay, and this, in essence, says the cost of  
8       funds, whether it's debt or equity used in  
9       construction, they'll be capitalized to the  
10      construction project.

11   A   Yes.

12   Q   Okay, and in this case, there is no  
13      construction project approved or even  
14      underway, is there?

15   A   No. At this point, it's a preliminary  
16      engineering study, and AFUDC is also  
17      capitalized on preliminary engineering studies  
18      for other projects as well.

19   Q   The need to apply for carrying costs on a  
20      deferred balance outside of a construction  
21      project is generally limited to situations  
22      where there's some sort of financial hardship;  
23      isn't that correct?

24   A   I don't know.

25   Q   You would agree with me that in this case,

1 Duke has made no showing of financial hardship  
2 or any significant earnings erosion if you  
3 don't receive the carrying costs, have you?  
4 A We have not presented information in this case  
5 that shows a financial hardship.  
6 Q Haven't prepared any calculations that might  
7 help the Commission determine financial  
8 hardship or an earnings erosion?  
9 A No.  
10 Q You would agree with me that receiving  
11 deferred accounting treatment for this study  
12 cost is in and of itself a special ratemaking  
13 treatment, isn't it?  
14 A Yes, it is.  
15 Q And, in fact, deferred treatment of this -- of  
16 these study costs gives Duke financial  
17 statement relief by keeping these expenses off  
18 of the income statement; correct?  
19 A Yes, it does.  
20 Q Now, as we discussed earlier, there is an  
21 equity component to the calculation of AFUDC;  
22 is that correct?  
23 A Yes, there is.  
24 Q Now, wouldn't you agree with me that any  
25 equity return should only be applied to actual

1 investments in real assets that provide real  
2 services to ratepayers?

3 A No, I don't think I would agree with you.

4 If the company is investing  
5 capital to do this study with the anticipation  
6 that a capital project could result and the  
7 company has other alternatives that it could  
8 invest that capital in other parts of the  
9 company where it would earn an equity return  
10 and perhaps a higher equity return than it  
11 would earn on an investment in Indiana, it is  
12 only fair that an equity return be considered  
13 on this investment as well.

14 Q Just to be clear, you are -- Duke is seeking  
15 an equity return on a study cost; correct?

16 A An equity return and a debt return on a  
17 study -- on a preliminary engineering study  
18 that's intended to result in a capital  
19 project.

20 Q In your estimation, or maybe you've even  
21 calculated this, how much of a carrying charge  
22 will be deferred with the other costs  
23 associated with this study?

24 A I have not calculated that.

25 Q It's not a lot; right?

1 A It was -- about \$13 million was the cash  
2 financing charges under our first proposal  
3 during the term of this study project.

4 Q Okay, but since we're no longer doing the  
5 cash, can you estimate for me what the  
6 carrying charge would be on a \$121 million --

7 A Well, my estimate would be about the 13. The  
8 rates will be slightly different because the  
9 AFUDC rate includes short-term debt, and what  
10 we proposed initially did not, and -- but it  
11 should be fairly close.

12 Q Pretty small potatoes compared to the overall  
13 study costs of 121 million; correct?

14 A It's smaller than the overall study costs,  
15 yes.

16 Q Certainly smaller than relative to Duke's  
17 income before taxes in 2008, which we  
18 calculated at 408 million; pretty small  
19 compared to that, isn't it?

20 A It's small in comparison to that, yes.

21 Q Given the fact that Duke is seeking deferral  
22 of study costs, which are the bulk of the  
23 costs and which will help Duke's financials  
24 and which the OUCC is not opposing, doesn't  
25 inclusion of a carrying charge on top of that



1       seem a bit greedy?

2    A   No, I don't think it's greedy because it is  
3       intended to reimburse the company for costs  
4       that it's incurring to obtain financing.  A  
5       piece of that financing is debt; a piece of  
6       that financing is equity, and there are costs  
7       that are being incurred for the benefit of the  
8       customer embarking on this study that will  
9       hopefully enable us to continue to use  
10      low-cost Indiana coal and continue to operate  
11      our reliable generating units for the benefit  
12      of customers.

13   Q   I'm not sure that answered my question, but --

14   A   I think it did.

15   Q   -- we'll move along.

16                   Now, you are aware of many of the  
17      trackers that Duke Energy Indiana has, are you  
18      not?

19   A   Yes.

20   Q   In fact, you testify on many of them; you  
21       testify on Duke's ECR tracker filing, don't  
22       you?

23   A   Yes, I do.

24   Q   And in ECR13, which I think was the last ECR  
25       approved by the Commission, approximately \$177

1 million is being tracked and recovered by Duke  
2 in a six-month period.

3 A I don't recall the amount.

4 Q Whatever it is, it includes a rate of return  
5 on investment, accelerated depreciation and  
6 O&M expenses, also, does it not?

7 A Yes, it does.

8 Q And if the 177 million is correct for a  
9 six-month period, that would be roughly over  
10 350 million on an annual basis; correct?

11 A Yes.

12 Q And construction is not totally completed on  
13 these ECR projects, are they?

14 A For the most part, it's completed. There are  
15 a couple ash ponds and some catalyst beds, I  
16 believe, that are still yet to be complete and  
17 still a few dollars for projects that are in  
18 service currently.

19 Q So, what, ECR 14 will be your last filing?  
20 Can we count on that?

21 A No. We track up; we track down. Even though  
22 we're depreciating the equipment, we've got  
23 over a billion dollars' worth of capital  
24 investments that we have invested for  
25 pollution control facilities for the customers

1 of Indiana.

2 Q Yes, for which your customers are paying  
3 100 percent of.

4 A Our customers are paying for that, and they're  
5 receiving the benefit of that as well.

6 Q And accelerated depreciation and a return.

7 A Yes, and Indiana laws allow incentives such as  
8 that for qualified pollution control  
9 facilities and clean coal technology.

10 Q Yes, right, and you will agree with me that  
11 this study is neither.

12 A I don't know if I agree with that or not. I  
13 don't know when carbon becomes a regulated air  
14 emission. Is it when the EPA says they intend  
15 to regulate it? Is it when the EPA passes  
16 rules? Is it when the Legislature passes  
17 laws? I don't know, but it very well could be  
18 covered under that legislation, Senate Bill  
19 29.

20 Q But it's not right now because there is no  
21 carbon emission restriction, is there?

22 A There is no federal law that I am aware of.

23 Q And there's no state law.

24 A I don't believe so.

25 Q And there's no state law that allows you to

1 receive deferred accounting with carrying  
2 costs for non-construction, non-pollution  
3 control projects.

4 A I'm not a lawyer.

5 Q Now, you're also involved with the IGCC  
6 tracker; correct?

7 A Yes, I am.

8 Q And that has an earnings component, too,  
9 includes an incentive return?

10 A Ask me that question again.

11 Q Okay. It includes an incentive return as part  
12 of the tracked recovery.

13 A It included a different cost of capital  
14 treatment that was an incentive to the company  
15 in the return calculation, yes.

16 Q Okay. It also includes operation and  
17 maintenance expenses and depreciation when it  
18 comes into service; correct?

19 A Yes.

20 Q The last IGCC tracker filing in IGCC3 tracked  
21 approximately \$28 million in rate of return  
22 alone; correct?

23 A I'm not sure if that was just rate of return  
24 or whether that included the small amount of  
25 depreciation in Black & Veatch fees that we

1       had as well.

2   Q   That's fair enough; it may have.   Okay.

3                       That was calculated on a \$503  
4       million investment.

5   A   That sounds about right.

6   Q   In addition to the IGCC and ECR tracker, Duke  
7       has other trackers; correct?   FAC?

8   A   Yes, all Indiana utilities have a fuel clause  
9       tracker.

10   Q   RTO, DSM, purchased power.   Have I left out  
11       any?

12   A   DSM, RTO, reliability tracker; I assume that's  
13       what you're calling the purchased power  
14       tracker.

15   Q   Yes, ma'am.

16   A   Yes.

17   Q   So, do you think that a carrying charge in  
18       cases like this when your company is seemingly  
19       protected from almost every rise in any price  
20       or cost with incentive added, do you really  
21       believe that a carrying charge is justified in  
22       this case?

23   A   Yes, because we're incurring additional  
24       financing costs for the benefit of customers.

25                       MR. HELMEN:   Just a second, Your

1 Honor.

2 Q Thank you, Ms. Douglas.

3 MR. HELMEN: Thank you, Your  
4 Honor. I'm done.

5 JUDGE STORMS: Thank you.  
6 Redirect for this witness?

7 MS. KARN: Yes. I just have a  
8 couple, Your Honor.

9

10

11 **REDIRECT EXAMINATION OF MS. DIANA L. DOUGLAS,**

12 **QUESTIONS BY MS. KARN:**

13 Q When you were discussing the incremental costs  
14 that may be borne by the company for -- to  
15 comply with the DOE funding request, when we  
16 have a proceeding where we're passing back the  
17 benefits, assuming we get the DOE grant first,  
18 and there's a proceeding before this  
19 Commission where the benefits of that grant  
20 are passing back, would we identify and  
21 calculate what those incremental costs would  
22 be for the parties and the Commission?

23 A Yes, we would.

24 Q Mr. Stewart was trying to bring you through  
25 some examples of what some incremental costs

1       would be.

2                   If, say, the DOE requires a  
3       consultant to be hired for NEPA reviews, a  
4       National Environmental Policy Act review, and  
5       they require the company to pay for that,  
6       would that be a type of incremental cost?

7                   MR. STEWART: I'll object as  
8       leading.

9                   JUDGE STORMS: Any response?

10                  MS. KARN: I was just trying to  
11       provide another example for her consideration.

12                  JUDGE STORMS: I'll overrule the  
13       objection. The witness may answer.

14                  WITNESS DOUGLAS: I can answer?

15                  JUDGE STORMS: Yes.

16   A   Yes, it would.

17                  MS. KARN: That's it, Your Honor.  
18       Thank you.

19                  JUDGE STORMS: Ms. Douglas, thank  
20       you very much for your testimony. You are  
21       excused.

22

23

24                       (WITNESS DIANA L. DOUGLAS EXCUSED  
25                       ON DIRECT AND REBUTTAL)

1 JUDGE STORMS: Do you have cross  
2 for the remaining witnesses?

3 MS. KARN: We do not have cross  
4 for the other parties' witnesses.

5 JUDGE STORMS: Does anybody have  
6 cross for these witnesses? Okay. So, we'll  
7 be able to put this in without too much of a  
8 time constraint and finish up today.

9 MS. KARN: Your Honor, before we  
10 rest, could we go off the record just for a  
11 minute?

12 JUDGE STORMS: Yes. We're off the  
13 record.

14

15 (Off-the-Record Discussion)

16

17 JUDGE STORMS: Let's go ahead and  
18 go back on the record.

19 I think the plan of attack is  
20 to -- Duke has not rested their case-in-chief  
21 and rebuttal, but I think the next step is to  
22 put in the remaining testimony. Is that the  
23 agreement that we've been able to reach so  
24 far? Then we can talk about whatever  
25 remaining issues there are with respect to the



1 remainder of the proceeding. So, we'll go  
2 ahead and start with the OUCC, and please call  
3 your first witness.

4 MR. TOLLIVER: Thank you, Your  
5 Honor.

6 MR. HELMEN: Can we just stipulate  
7 it?

8 JUDGE STORMS: That's fine with  
9 me. Do you have any changes to be made or  
10 anything?

11 MR. HELMEN: Just one minor number  
12 that we can do on the record, if that's okay.

13 JUDGE STORMS: That's fine.

14 MR. HELMEN: She's already signed  
15 it.

16 JUDGE STORMS: Okay, that's fine.  
17 We can stipulate it in. Please proceed.

18 MR. TOLLIVER: Thank you, Your  
19 Honor.

20 At this time, the Public would  
21 move to admit Public's Exhibit No. 1, the  
22 prefiled testimony of Cynthia M. Armstrong,  
23 with one change that has been noted on Page  
24 10, Line 15. Ms. Armstrong has changed the  
25 date from August 24, 2009 to August 20, 2009,

1       and along with Public's Exhibit No. 1 and the  
2       attachments thereto is also Public's Exhibit  
3       No. 1-C and the attachments thereto, which is  
4       the confidential portion of Ms. Armstrong's  
5       testimony.

6               In addition, the Public would also  
7       move to admit Public's Exhibit No. 2, which is  
8       the prefiled testimony of Wes R. Blakley.

9               JUDGE STORMS:   Okay.   We'll show  
10       Public's Exhibits 1 and 1-C and Public's  
11       Exhibit 2 admitted into this cause pursuant to  
12       stipulation of the parties.

13              MR. TOLLIVER:   Thank you, Your  
14       Honor.   With that, the Public rests.

15  
16                       (PUBLIC'S EXHIBIT NO. 1, BEING THE  
17                       PREFILED DIRECT TESTIMONY OF MS.  
18                       CYNTHIA M. ARMSTRONG, AND PUBLIC'S  
19                       EXHIBIT NO. 2, BEING THE PREFILED  
20                       DIRECT TESTIMONY OF MR. WES R.  
21                       BLAKLEY, ADMITTED INTO EVIDENCE.)

22  
23  
24  
25

1 (PUBLIC'S EXHIBIT NO. 1-C, BEING A  
2 CONFIDENTIAL DOCUMENT, ADMITTED  
3 INTO EVIDENCE ON A CONFIDENTIAL  
4 BASIS. )  
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1 JUDGE STORMS: Mr. Polk?

2 MR. POLK: Thank you, Your Honor.

3 I would like to introduce on behalf of  
4 Intervenor, Citizens Action Coalition, the  
5 direct testimony of -- and exhibits of Kerwin  
6 L. Olson marked as CAC Exhibit A.

7 JUDGE STORMS: We'll show CAC  
8 Exhibit A admitted into this cause pursuant to  
9 stipulation of the parties.

10

11 (INTERVENOR'S - CAC EXHIBIT NO. A,  
12 BEING THE PREFILED DIRECT  
13 TESTIMONY OF MR. KERWIN L. OLSON,  
14 ADMITTED INTO EVIDENCE.)

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1 JUDGE STORMS: Does CAC rest?

2 MR. POLK: Yes, CAC rests.

3 JUDGE STORMS: Do we need to  
4 discuss the remaining issue off the record or  
5 on the record? Let's go off the record.

6 MS. KARN: I'll say off first.

7 MR. STEWART: Are they going to  
8 rest as well, then?

9 MS. KARN: After this issue.

10 JUDGE STORMS: Well, I think we  
11 need to discuss the issue first before we  
12 determine -- and then we'll go back on the --  
13 We're off the record.

14

15 (Off-the-Record Discussion)

16

17 JUDGE STORMS: Let's go ahead and  
18 go back on the record.

19 We have had a brief discussion  
20 with respect to a vehicle to get information  
21 with respect to the CCPI Round Three filing  
22 that has been submitted to the DOE, and we  
23 have reached essentially an agreement to allow  
24 for a late-filed exhibit with respect to that  
25 information and an opportunity for the

1       intervening parties and the Office of Utility  
2       Consumer Counselor to respond to that filing  
3       and then an opportunity for Duke Energy  
4       Indiana to file a document that replies to  
5       those responses. From what our discussion  
6       was, it does not anticipate filing necessarily  
7       additional testimony; it's just a means to  
8       convey that information into the record with a  
9       late-filed exhibit.

10               Following that, what we would also  
11       need from the parties is a procedural schedule  
12       or proposed schedule for the submission of  
13       proposed orders in this cause, and what our  
14       intention is now -- it's almost ten to five --  
15       is to give the parties an opportunity to  
16       develop that schedule and their agreement on  
17       that issue and submit that to the Commission  
18       tomorrow morning.

19               Does that sound fair so far? Have  
20       I missed anything?

21               MS. KARN: Yes, Your Honor.

22               JUDGE STORMS: Okay. Having said  
23       that, we will give the parties an opportunity  
24       to develop that schedule and that specific  
25       proposal with an identification of the

1 document appropriately as a late-filed  
2 exhibit, and I don't know what the next number  
3 or letter in the sequence is, but let's go  
4 ahead identify that and identify the  
5 responsive filings consistent with the  
6 parties' filings as well, and we will leave  
7 the record open, and I will continue this  
8 matter until tomorrow morning at 9:30, and  
9 assuming I will -- if I can get an electronic  
10 submission of the parties' agreement and the  
11 proposed schedule, what I will simply do is  
12 enter that into the record at that time. It's  
13 not necessary for the parties to return to the  
14 Commission tomorrow morning, and then we will  
15 just establish that as the schedule and then  
16 close the record.

17 MS. KARN: With that, Duke Energy  
18 Indiana rests.

19 JUDGE STORMS: Okay. I just  
20 wanted to make sure.

21 Are there any other concerns or  
22 anything the parties have raised with that? I  
23 will leave it to you to put in writing what  
24 your agreement is, and it's my intention to  
25 not deviate from that in any respect as far as

1 post-hearing -- or the late-filed exhibit and  
2 the procedural schedule for proposed orders.  
3 So, I'll simply enter that into the record.  
4 If it's necessary, I can put something out in  
5 writing in a Docket Entry that confirms that,  
6 but -- if the parties would like. Any  
7 attraction to that offer? If not, I'll just  
8 confine it to the record, and the parties will  
9 know what they have agreed to, and that will  
10 be reflected in the record tomorrow morning.

11 Having said that, this matter is  
12 hereby continued until tomorrow at 9:30.  
13 Thank you very much.

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23 (HEARING IN RECESS UNTIL NOVEMBER 10, 2009  
24 AT 9:30 A.M. (EST) IN ROOM 222 OF THE  
25 NATIONAL CITY CENTER, INDIANAPOLIS, INDIANA)



\$	200 square [1] 117/11 2008 [5] 74/7 97/13 99/15 101/14 152/17 2009 [9] 1/1 58/1 66/5 74/11 75/9 111/25 161/25 161/25 168/23 2010 [1] 59/18 22 [2] 115/13 115/14 222 [1] 168/24 23 [4] 115/6 115/12 115/13 115/14 24 [3] 115/6 115/12 161/25 25 [2] 119/14 120/6 25 miles [1] 97/23 25 percent [8] 26/24 42/24 47/2 47/6 47/9 52/21 53/2 140/14 26 [2] 123/20 124/5 29 [1] 155/19 2:25 [2] 57/25 58/2 2nd [4] 7/20 8/1 10/6 10/8	8 800 feet [1] 118/18
\$116 [1] 35/20 \$120 [1] 45/17 \$121 [2] 145/18 152/6 \$13 [1] 152/1 \$177 [1] 153/25 \$2.35 [1] 21/2 \$28 [1] 156/21 \$42 [2] 46/12 46/18 \$503 [1] 157/3	9 9:30 [3] 167/8 168/12 168/24	
- .eligible [1] 59/24 .we [1] 146/8	A A.M [1] 168/24 able [8] 8/3 44/12 104/23 104/24 115/18 119/1 160/7 160/23 about [82] 9/4 9/10 10/16 17/18 21/1 21/13 24/23 26/4 26/15 29/9 29/24 30/12 30/13 30/22 33/14 33/22 36/14 37/18 38/13 39/8 41/10 44/3 44/19 45/10 46/10 49/11 51/24 53/7 53/10 53/14 56/12 56/22 57/1 57/3 57/13 80/11 89/6 89/14 90/5 90/6 91/5 93/5 95/9 97/10 97/17 97/22 98/4 99/7 99/9 99/20 100/11 100/14 101/13 102/14 103/4 106/2 106/21 109/8 110/14 112/20 113/15 114/7 114/9 114/12 115/8 116/18 116/20 117/8 117/25 119/25 120/2 120/24 121/17 122/18 125/4 138/25 139/7 143/5 152/1 152/7 157/5 160/24 above [1] 26/23 Absolutely [1] 55/8 academic [1] 88/2 accelerated [2] 154/5 155/6 acceleration [2] 101/22 102/1 acceptable [7] 94/7 94/17 95/1 95/6 95/10 95/14 96/5 Accepted [1] 133/5 accident [1] 95/11 accidents [4] 94/8 94/9 94/18 95/6 accordance [1] 133/4 account [12] 3/11 41/14 60/22 66/11 74/21 75/18 78/16 102/7 115/21 117/16 118/15 145/9 accounting [10] 133/3 133/5 133/7 133/7 133/8 133/9 143/16 145/15 150/11 156/1 accounting -- the [1] 133/7 accuracy [2] 24/4 24/11 accurate [4] 8/12 42/23 51/18 99/6 accurately [2] 22/23 24/13 achieve [1] 21/12 acquire [1] 26/17 acquired [1] 19/24 acre [1] 118/1 across [2] 109/22 130/21 Act [1] 159/4 acting [1] 129/10 Action [1] 164/4 activities [5] 45/14 46/14 46/22 56/4 75/11 activity [2] 55/14 100/18 actual [7] 26/16 26/17 26/18 53/18 109/2 117/18 150/25 actually [9] 12/2 19/13 29/23 45/12 48/24 49/22 105/2 117/12 142/4 add [5] 49/10 51/16 60/13 66/4 145/22 added [3] 21/5 47/2 157/20 adding [4] 28/9 52/3 104/3 104/4 addition [4] 28/22 46/18 157/6 162/6 additional [6] 45/7 45/22 49/1 50/22 157/23 166/7 Additionally [2] 122/14 122/16 address [2] 37/5 48/13 addressing [1] 23/25 adds [1] 49/10 adequate [1] 40/24 adjustment [1] 140/1	
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