

## STATE OF NEW MEXICO

## ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

## OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING )  
 CALLED BY THE OIL CONSERVATION )  
 DIVISION FOR THE PURPOSE OF )  
 CONSIDERING: )  
 APPLICATION OF AMOCO PRODUCTION )  
 COMPANY )

CASE NOS. 11,051,  
 11,052, 11,053,  
 11,054, 11,055  
 and 11,056  
 (Consolidated)

**ORIGINAL**

REPORTER'S TRANSCRIPT OF PROCEEDINGSEXAMINER HEARING

BEFORE: MICHAEL E. STOGNER, Hearing Examiner

August 4, 1994

Santa Fe, New Mexico

- 2 1994

This matter came on for hearing before the Oil  
 Conservation Division on Thursday, August 4, 1994, at  
 Morgan Hall, State Land Office Building, 310 Old Santa Fe  
 Trail, Santa Fe, New Mexico, before Steven T. Brenner,  
 Certified Court Reporter No. 7 for the State of New Mexico.

\* \* \*

## I N D E X

August 4, 1994  
 Examiner Hearing  
 CASE NOS. 11,051, 11,052, 11,053, 11,054, 11,055 and 11,056  
 (Consolidated)

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## A P P E A R A N C E S

FOR THE DIVISION:

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FOR THE APPLICANT:

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By: WILLIAM F. CARR

\* \* \*

1 WHEREUPON, the following proceedings were had at  
2 10:38 a.m.:

3 EXAMINER STOGNER: Call Case Number 11,051, which  
4 is the Application of Amoco Production Company for a high  
5 angle/horizontal directional drilling pilot project and  
6 special operating rules therefor, San Juan County, New  
7 Mexico.

8 Call for appearances.

9 MR. CARR: May it please the Examiner, my name is  
10 William F. Carr with the Santa Fe law firm Campbell, Carr,  
11 Berge and Sheridan.

12 I represent Amoco Production Company in this  
13 case, and I have three witnesses.

14 Initially, Mr. Stogner, I would request that this  
15 case be consolidated for purposes of hearing with Cases  
16 11,052, 11,053, 11,054, 11,055, and 11,056.

17 All of these cases are Applications of Amoco for  
18 approval of high angle/horizontal directional drilling  
19 pilot projects. All of them are in the same formations, in  
20 the same area, and the testimony will be largely -- would  
21 be virtually identical in these cases, and for that reason  
22 I move that they be consolidated for purposes of testimony  
23 only.

24 EXAMINER STOGNER: And do you propose the same  
25 three witnesses?

1 MR. CARR: Yes, sir.

2 EXAMINER STOGNER: Are there any objections?

3 Are there any other appearances in Cases 11,051  
4 through 11,056?

5 With that, for purposes of consolidation, I will  
6 call Cases 11,052, 11,053, 11,054, 11,055 and 11,056, which  
7 are all the Applications of Amoco Production Company for a  
8 high angle/horizontal directional drilling pilot project  
9 and special operating rules therefor, all in San Juan  
10 County, New Mexico. They will now be consolidated.

11 And Mr. Carr, you may continue.

12 MR. CARR: Mr. Stogner, I have three witnesses  
13 who need to be sworn.

14 EXAMINER STOGNER: Will the three witnesses  
15 please stand to be sworn at this time?

16 (Thereupon, the witnesses were sworn.)

17 EXAMINER STOGNER: Mr. Carr?

18 MR. CARR: At this time we'll call Gary Weitz.

19 GARY WEITZ,  
20 the witness herein, after having been first duly sworn upon  
21 his oath, was examined and testified as follows:

22 DIRECT EXAMINATION

23 BY MR. CARR:

24 Q. Would you state your name for the record, please?

25 A. My name is Gary Weitz. Last name is spelled

1 W-e-i-t-z.

2 Q. And where do you reside?

3 A. Denver, Colorado.

4 Q. By whom are you employed?

5 A. Amoco Production Company.

6 Q. And what is your current position with Amoco?

7 A. As a landman.

8 Q. Mr. Weitz, have you previously testified before  
9 this Division and had your credentials as a petroleum  
10 landman accepted and made a matter of record?

11 A. Yes, I have.

12 Q. Are you familiar with the Applications filed on  
13 behalf of Amoco in each of these consolidated cases?

14 A. Yes, I am.

15 Q. Are you familiar with the status of the land  
16 surrounding each of the proposed project areas?

17 A. Yes, I am.

18 MR. CARR: Are the witness's qualifications  
19 acceptable?

20 EXAMINER STOGNER: They are.

21 Q. (By Mr. Carr) Initially, Mr. Weitz, could you  
22 just state what Amoco seeks in each of these Applications?

23 A. Okay, Amoco seeks approval of a 320-acre  
24 directional drilling pilot project area for each of the six  
25 horizontal wells.

1           We also seek authority to drill a high-angle  
2 horizontal well on each of the project areas, and we  
3 request special operating rules to permit the traverse of  
4 quarter and quarter-quarter section lines with horizontal  
5 wellbore within the project area, as well as to drill  
6 within 790 feet of the outer boundary of the project area.

7           Q.   And it's your understanding that 790 feet is a  
8 standard setback for the Mesaverde formation in this area?

9           A.   Yes, that's correct.

10           MR. CARR: Mr. Stogner, we have prepared an  
11 individual exhibit packet or booklet for each of these  
12 cases. To facilitate in presenting the case, I've asked  
13 Mr. Weitz to copy Exhibit Number 1, and so in presenting  
14 his testimony we will first refer to what you have as Amoco  
15 Exhibit A, which is the large plat, and then so we don't  
16 have to open each of the books and look for Exhibit Number  
17 1, I have stapled copies of that exhibit together, and that  
18 is the second item in the packet of material.

19           Q.   (By Mr. Carr) Mr. Weitz, would you now refer to  
20 what has been marked for identification as Amoco Production  
21 Company Exhibit Number A?

22           A.   Yes.

23           Q.   Identify this and review it for the Examiner.

24           A.   Yes. Okay, Exhibit A contains Townships 30  
25 North, Range 8 West, and a portion of Township 31 North,

1 Range 8 West.

2 Starting in the southeast corner of the map, the  
3 first well that we're taking a look at, we're bringing to  
4 the Commission, is the Thompson LS 2R. It's located in  
5 Township 30, Range 8 West, and it's a west-half spacing in  
6 Section 34.

7 Moving to the northeast, the next well we'll take  
8 a look at is the Gartner 8R -- or, excuse me, is the  
9 Gartner A 8. It's located in Township 30 North, Range 8  
10 West, the east half of 26.

11 Moving to the west is the Gartner A 2R. This is  
12 a well that the Commission has previously approved of.

13 Moving further to the west, we have the Lindsey A  
14 LS Number 1A. It's located in Township 30 North, Range 8  
15 West, the east half of Section 19.

16 From there, moving to the north, we move to the  
17 well called the Moore 5R. Originally this was the Moore 5.  
18 We ~~looked~~ at the casing, and the casing does not present us  
19 the opportunity to go ahead and re-enter, so now we're  
20 looking at drilling a replacement well, and this is located  
21 in Township 30 North, Range 8 West, the south half of  
22 Section 9.

23 Moving further to the north, we move to the  
24 Florance H 37R, located in Township 30 North, Range 8 West,  
25 the east half of Section 9 [sic].



1           And the final well to the north, which is located  
2   in Township 31 North, Range 8 West, the east half of  
3   Section 29, is the Kernaghan B 3A.

4           Q.   Mr. Weitz, if we look at this exhibit, what you  
5   have indicated and what you have identified with your  
6   testimony is the location of each of these six wells which  
7   are the subject of the consolidated cases?

8           A.   Yes, that's correct.

9           Q.   If we go through these wells and we look at the  
10   Gartner A 8, which is the subject of Case 11,051 --

11          A.   That's correct.

12          Q.   -- that well is located where?

13          A.   That well is located in the east half of Section  
14   26, Township 30 North, Range 8 West.

15          Q.   Is that to be a re-entry?

16          A.   Yes, it is.

17          Q.   Okay. And then we move from that to the next  
18   case, 11,052, which is the Moore Number 5. That's the well  
19   in -- ?

20          A.   That's located in Township 30 North, Range 8  
21   West, in the south half of Section 9.

22          Q.   And you've indicated or testified that that's to  
23   be a replacement well?

24          A.   Yes, that's correct.

25          Q.   Okay. If we go on, then, to the next case,

1 11,053, the Kernaghan Number 3, where is that well?

2 A. That's located in the east half of Section 29,  
3 Township 31 North, Range 8 West.

4 Q. And is that a re-entry?

5 A. Yes, it is.

6 Q. The Florance 37 is --

7 A. The Florance 37 is located in Township 30 North,  
8 Range 8 West, the east half of Section 6, and this is a  
9 replacement well.

10 Q. All right. The Thompson Number 2, the subject of  
11 Case 11,055, is located where?

12 A. Township 30 North, Range 8 West, the west half of  
13 Section 34, and this is also a replacement well.

14 Q. And then the Lindsey, the subject of 11,056, that  
15 well is --

16 A. -- located in Township 30 North, Range 8 West, in  
17 the east half of Section 19, and this is a new drill. It's  
18 an infill well.

19 Q. It's not a replacement; it's a new infill well?

20 A. That's right.

21 Q. Okay. Let's go to the next set of documents in  
22 the exhibit packet. This is a compilation of Exhibits  
23 Number 1 from each of these cases.

24 Could you simply identify those for the Examiner,  
25 please?

1           A.    Okay, Exhibit 1 is referred to as Case 11,051,  
2    and it's a land plat indicating the location of the Gartner  
3    A 8 Well.

4                   Exhibit Number 1, again related to Case Number  
5    11,052, is a land plat indicating the location of the Moore  
6    5R, which is Township 30 North, Range 8 West, the south  
7    half of Section 9, and this is a replacement well.

8                   Case Number 11,053, this is also a land plat  
9    indicating the location of the Kernaghan B 3A, which is a  
10   re-entry well, located in Township 31 North, Range 8 West,  
11   Section 29, the east half.

12                  The next Exhibit Number 1 is Case Number 11,054,  
13   again a land plat located in Township 30 North, Range 8  
14   West, the east half of Section 6, indicating the location  
15   of the Florance H 37R, which is a replacement well.

16                  The next plat is a land plat for Case 11,055, for  
17   the Thompson LS Number 2R well, located in Township 30  
18   North, Range 8 West, the west half of Section 34.

19                  And the last plat is also a land plat indicating  
20   Case 11,056, for the Lindsey A LS Number 1A, located in  
21   Township 30 North, Range 8 West, the east half of Section  
22   19.

23           Q.    Mr. Weitz, on each of these exhibits you have a  
24   code that identifies all the offsetting operators to each  
25   of the proposed project areas; is that correct?

1 A. Yes, we have.

2 Q. And how many offset operators, total, do we have  
3 we're required to provide notice?

4 A. We have three offset operators, them being  
5 Meridian Oil, Blackwood and Nichols Company and Conoco,  
6 Inc.

7 Q. And have actual copies of the letter Application  
8 and these plats been submitted by certified mail to each of  
9 those offsetting operators?

10 A. Yes, we have.

11 Q. If we go to the last page or the last Exhibit  
12 Number 1, we're looking at the Lindsey A LS Number 1A Well?

13 A. Yes.

14 Q. That well location was originally proposed 790  
15 from the south line and 1000 from the east line?

16 A. That is correct, and there's been a change on it.

17 Q. And what is the new location for that well?

18 A. The new location is 790 feet from the south line  
19 and 1100 feet from the east line.

20 Q. This is still easily within the 790-foot setback  
21 for the project window; is that right?

22 A. Yes, it is.

23 Q. You're proposing to dedicate or create a project  
24 area for each of these wells of 320 acres?

25 A. That is correct.

1           Q.   Is that a standard spacing unit for wells in this  
2 pool, the Blanco Mesaverde Pool?

3           A.   Yes, it is.

4           Q.   And notice has been provided to each of the  
5 affected offsetting operators?

6           A.   Yes, we have.

7           Q.   Will Amoco also be calling geological and  
8 engineering witnesses to review the technical portions of  
9 this case?

10          A.   Yes, we will.

11          Q.   Were Exhibits 1 in each of these exhibit booklets  
12 prepared by you or compiled at your direction?

13          A.   Yes, they are.

14               MR. CARR: At this time, Mr. Stogner, we move the  
15 admission of Amoco Exhibit Number 1 in each of these  
16 consolidated cases.

17               EXAMINER STOGNER: Exhibit 1 in each of the  
18 consolidated cases will be admitted at this time.

19               MR. CARR: And that concludes my direct  
20 examination of Mr. Weitz.

21                               EXAMINATION

22               BY EXAMINER STOGNER:

23           Q.   You have an additional one on the Gartner A 2R?  
24 You said that was an existing project --

25           A.   Yes, it is.

1 Q. -- that previously had been approved?

2 A. And has been approved, yes.

3 Q. You don't happen to know that order number, by  
4 chance, do you?

5 A. No, I don't.

6 Q. Okay, no problem. I can look it up. Just  
7 wanting a reference in here.

8 And you offset Meridian in all matters, and  
9 Blackwood and Nichols in the top two?

10 A. Yes.

11 Q. And --

12 A. -- Conoco also.

13 Q. In one?

14 A. Right.

15 Q. And in each instance, all these proration units  
16 are in existence; is that correct?

17 A. That's correct.

18 Q. With a producing well or it having a -- being  
19 helped by production?

20 A. Yes, that's correct.

21 Q. Are all these BLM or federal?

22 A. They're all federal.

23 EXAMINER STOGNER: I have no other questions of  
24 this witness, Mr. Carr. Thank you.

25 MR. CARR: Thank you, Mr. Stogner.

1           Mr. Stogner, the Division order approving the  
2           Gartner A Number 2 and 2A wells and the horizontal project  
3           area for those wells is Order Number R-10,108. It was  
4           entered by the Division on April 29th, 1994.

5           EXAMINER STOGNER: Thank you, Mr. Carr.

6           MR. CARR: At this time we call Mr. Craig.

7           And in Mr. Craig's presentation, Mr. Stogner, it  
8           would probably be most useful to refer to -- we'll be  
9           referring to two of the exhibit books, the first one, the  
10          one for Case 11,051, and then the one that I think is two  
11          back in the stack of exhibits is for Case 11,053. Those  
12          are the two books that -- exhibit booklets we'll be  
13          referring to.

14                               GERALD CRAIG,  
15          the witness herein, after having been first duly sworn upon  
16          his oath, was examined and testified as follows:

17                               DIRECT EXAMINATION

18          BY MR. CARR:

19               Q.    Would you state your name for the record, please?

20               A.    Gerald Craig.

21               Q.    Mr. Craig, where do you reside?

22               A.    Denver, Colorado.

23               Q.    By whom are you employed?

24               A.    Amoco Production Company.

25               Q.    What is your current position with Amoco?

1           A.    Petroleum geologist.

2           Q.    Have you previously testified before this  
3 Division?

4           A.    No.

5           Q.    Could you summarize your educational background  
6 for Mr. Stogner?

7           A.    I received my bachelor's of science in geology  
8 from the University of Texas in 1980, my master's of  
9 science in geology from Colorado State University in 1982.  
10 I started work for Amoco Production company in 1982 and I'm  
11 currently employed.

12          Q.    You've worked for Amoco throughout your  
13 professional career?

14          A.    That's correct.

15          Q.    Are you familiar with the Application filed by  
16 Amoco in each of the cases which has been consolidated in  
17 this hearing?

18          A.    Yes.

19          Q.    Have you made a geological study of the area  
20 surrounding each of the project areas in the Blanco  
21 Mesaverde Pool?

22          A.    Yes, I have.

23               MR. CARR:  Are the witness's qualifications  
24 acceptable?

25               EXAMINER STOGNER:  They are.



1           Q.    (By Mr. Carr) Initially, Mr. Craig, would you  
2 provide the Examiner a general summary of the  
3 characteristics of the Mesaverde formation in this area?

4           A.    The Mesaverde Group actually consists of three  
5 formations, the lowermost being the Point Lookout  
6 formation, which is primarily a sandstone-bearing unit.  
7 Above that is the Menefee formation, which consists of  
8 sandstones, shales, coals. And the uppermost formation,  
9 the Cliff House formation, which again, is primarily a  
10 sandstone-bearing unit.

11               All three formations are productive in the area,  
12 with a typical well making anywhere from 2 to 5 BCF over  
13 its lifetime. There are exceptions of some wells making  
14 anywhere from 10 to 50 BCF over their lifetimes. We  
15 attribute this increased production to the existence of a  
16 natural fracture system in the Mesaverde group in this  
17 area.

18           Q.    Now, in terms of the Applications for horizontal  
19 wells, you're looking at all possible intervals within the  
20 Mesaverde group?

21           A.    That's correct.

22           Q.    Have you prepared certain exhibits for  
23 presentation here today?

24           A.    Yes, I have.

25           Q.    Let's go to the exhibit book for the first case,

1 Case 11,051, and I'd ask you to go in that booklet to  
2 Exhibit Number 2, the combination cross-section and  
3 diagrammatic sketch. I'd like you to identify the exhibit  
4 and then review this for Mr. Stogner.

5 A. Okay, Exhibit Number 2 is a composite exhibit  
6 showing both the stratigraphy in the area and a one-section  
7 plat showing the location of the pertinent wells.

8 We focus on the one-section plat on the right-  
9 hand side of the exhibit, we show the legal drilling window  
10 shaded in the light blue color with the 790-foot setbacks  
11 marked around that window. The subject well, the Gartner A  
12 8, is in the northern portion of that window. This would  
13 fall on the left-hand side of the cross-section.

14 And then the other well on the cross-section, the  
15 Gartner A 8 A, is in the southern part of the window.

16 We've also indicated the proposed horizontal  
17 trajectory from the Gartner A 8 in the somewhat darker blue  
18 color.

19 Q. Let's go to the cross-section portion of this  
20 exhibit now. Can you identify the wells and review this  
21 for Mr. Stogner?

22 A. Okay. As I stated, the cross-section consists of  
23 the Gartner A 8 and Gartner A 8 A wells. We've used and  
24 gamma-ray and induction resistivity logs in both wells.  
25 The Mesaverde stratigraphy is shown on both wells.

1           Our primary interval of interest would be the  
2 Point Lookout formation, which is highlighted in yellow.  
3 It is a laterally persistent sandstone within this area.  
4 It's highly correlative between the two wells, and it  
5 ranges in gross thickness from about 100 feet on the  
6 Gartner A 8 on the left-hand side to about 80 feet in the  
7 Gartner A 8 A on the right-hand side of the cross-section.

8           Q.    So you've highlighted the Point Lookout?

9           A.    That's correct.

10          Q.    In terms of the thickness of the pay in this  
11 portion of the Mesaverde, do you have a reasonable  
12 candidate for a horizontal well from a geologic point of  
13 view?

14          A.    I believe so, given the lateral persistence and  
15 the thickness, that this is a good horizontal candidate.

16          Q.    Is it possible that other zones, either the  
17 Menefee or the Cliff House might, when you get down to the  
18 formation, be logical candidates also for horizontal  
19 development?

20          A.    That's correct, the Cliff House formation is  
21 another possible target. In fact, the Kernaghan B 3 well  
22 is the one well out of the package of six that we're  
23 actually proposing be drilled horizontally in the Cliff  
24 House.

25          Q.    Okay, let's go to Exhibit 2 in Case 11,053, and

1 I'd ask you to review the Exhibit Number 2 for Mr. Stogner.

2 A. Again, this is the same type of exhibit as in the  
3 Gartner A 8R case. In this situation, however, we felt  
4 that the development of the sand in the Cliff House  
5 formation was a little bit better than in the Point Lookout  
6 formation in the Kernaghan B 3A well on the left-hand side.  
7 For this reason, we wanted to target the horizontal well  
8 within the Cliff House formation.

9 Q. Again, you have high correlation across the  
10 interval?

11 A. That's correct.

12 Q. Sufficient pay thickness for a reasonable attempt  
13 at a horizontal well?

14 A. Yes, that's correct.

15 Q. Again in this well, if you got into it and were  
16 unsuccessful, or in the Cliff House, is it possible you  
17 would also want to go down and attempt a horizontal  
18 wellbore in the Point Lookout?

19 A. That's a possibility also, as the Point Lookout  
20 tends to be a little bit better developed towards the  
21 Kernaghan Number 3 well on the right-hand side of the  
22 display.

23 Q. In fact, Mr. Craig, the first horizontal well in  
24 the area, the Gartner A Number 2, the one that was  
25 previously approved, that was actually an attempt in the

1 Cliff House, was it not? Or was that also Point Lookout?

2 A. Actually, the very first well in the area, the  
3 Van Hook well, was a Point Lookout completion. The Gartner  
4 well you referred to is a Cliff House completion we're  
5 currently drilling.

6 Q. Now, we have consolidated cases for purpose of  
7 testimony, and you have shown one cross-section on the  
8 Point Lookout, one on the Cliff House.

9 Are the conclusions and the general geologic  
10 interpretations for all of the wells in the cases that have  
11 been consolidated for this hearing -- would those  
12 interpretations all be similar?

13 A. Yes.

14 Q. And in all of those cases you would find high  
15 correlation across the zone of interest within the  
16 Mesaverde formation?

17 A. Yes.

18 Q. And in each of those you have a good candidate  
19 for a horizontal well?

20 A. Yes.

21 Q. What information do you have on the general  
22 fracture orientations in this area?

23 A. We have run some fracture identification logs on  
24 some of the wells in the area, including the Van Hook well,  
25 which is our first horizontal completion in the area.

1 Those logs show -- prefer a primary fracture orientation to  
2 the northeast.

3 Q. And that's generally just consistent with what  
4 you've understood about the formation all along?

5 A. Exactly.

6 Q. Let's go back to the exhibit packet for Case  
7 11,051. I'd ask you to refer to Exhibit Number 3 in that  
8 booklet, identify this exhibit, and then review it for Mr.  
9 Stogner.

10 A. Exhibit Number 3 is a structural contour map over  
11 a nine-section area surrounding the Gartner A Number 8.  
12 The structure of the horizon mapped is the top of the Cliff  
13 House E zone, which, if you just flip back quickly to  
14 Exhibit 2, shows up at about a depth of 4390 feet in the  
15 Gartner A well.

16 Q. What does this structural interpretation tell you  
17 about the Mesaverde formation in this area?

18 A. What the structure map shows is that we have a  
19 number of flexures in the structural contours, structural  
20 noses, that all seem to trend towards the northeast,  
21 parallel to the fracture system that we've identified in  
22 the fracture identification logs.

23 We interpret that the structural noses we see are  
24 a result of faulting, that there is fractures associated  
25 with this faulting.

1 Q. And in each of these cases, you're locating these  
2 proposed wells in areas where you find the flexure or these  
3 noses?

4 A. Exactly.

5 Q. And that's the structural significance, because  
6 in those areas is where you are most likely to encounter  
7 the fracture system?

8 A. Yes, and in terms of the Gartner A Number 8  
9 location, you will note that there is a northeast trending  
10 structural nose just to the south of it. We've set up the  
11 horizontal trajectory for this well to move to the south  
12 southeast and south southeast [sic] direct to cross that  
13 nose and stay within the legal drilling window.

14 Q. Based on your geologic review of this portion of  
15 the Mesaverde formation, what conclusions have you reached?

16 A. Well, based on thickness, lateral persistence of  
17 the sands within the areas, favorable structural position,  
18 I think these are excellent candidates for horizontal  
19 completion.

20 Q. Were Exhibits 2 and 3 in each of these cases  
21 either prepared by you or can you testify as to the  
22 accuracy of the exhibits?

23 A. Yes, they were.

24 MR. CARR: Mr. Stogner, at this time we would  
25 move the admission of Amoco Exhibits 2 and 3 in each of the

1 consolidated cases.

2 EXAMINER STOGNER: Exhibits 2 and 3 in each of  
3 the consolidated cases will be admitted into evidence at  
4 this time.

5 MR. CARR: And that concludes my direct  
6 examination of this witness.

7 EXAMINATION

8 BY EXAMINER STOGNER:

9 Q. Mr. Craig, it looks like in all cases except one  
10 the orientation of the horizontal drilling is going to be  
11 in a north and south direction, except for Case 11,052. Is  
12 that going to be -- not a problem, but is that going to be  
13 affecting not being able to cross the fractures, or do you  
14 see any difference out there?

15 A. In the case that you refer to, we were restricted  
16 by the orientation of the spacing unit. It might affect  
17 us, but we still feel that we can move the trajectory to  
18 intercept fractures in the area, given that we're going to  
19 be going out about 2000 feet horizontally.

20 Q. In that one, would you still like to see a north  
21 and south if it was feasible?

22 A. If it was feasible, we would like to orient it a  
23 little bit more north-south.

24 Q. For technical purposes?

25 A. Yes.



1           Q.   And orient me here a little bit on the difference  
2   between the Cliff House E and the Cliff House formations in  
3   this area.

4           A.   Okay, if you're referring to, say, Exhibit 2  
5   and --

6           Q.   It looks like you probably make that reference in  
7   all of the --

8           A.   It's a consistent horizon. In fact, that's why  
9   we chose it for the structural map. It is a bentonite  
10   marker which shows up throughout the area.

11                   The Cliff House E is one of the multiple  
12   divisions within the Cliff House proper. We refer to the  
13   Cliff House -- For horizontal completion purposes, we're  
14   referring to the basal sand, which seems to be better  
15   developed in all cases.

16           Q.   On the remainder of -- or the majority of the  
17   exhibits, your structure map, why did you pick the Cliff  
18   House E as opposed to, say, the Menefee to describe the  
19   Point Lookout? The Point Lookout is going to be, for the  
20   most part, all except that one, your zone of interest for  
21   the horizontal projects.

22           A.   The reason we chose the Cliff House E was -- Like  
23   I said, there's a bentonite marker that's persistent  
24   throughout the area. One of the problems with choosing the  
25   Menefee or the Point Lookout is that, especially within the

1 Menefee, some of these sands come and go. The Point  
2 Lookout also, although it is persistent, does vary in  
3 thickness.

4 EXAMINER STOGNER: I have no other questions of  
5 the geological witness.

6 Mr. Carr?

7 MR. CARR: We have no further questions of Mr.  
8 Craig, and at this time we would call Bill Hawkins.

9 J.W. "BILL" HAWKINS,  
10 the witness herein, after having been first duly sworn upon  
11 his oath, was examined and testified as follows:

12 DIRECT EXAMINATION

13 BY MR. CARR:

14 Q. State your name and place of residence.

15 A. Bill Hawkins, Denver, Colorado.

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

17 A. Amoco Production Company, as a petroleum  
18 engineer.

19 Q. Have you previously testified before this  
20 Division?

21 A. Yes, I have.

22 Q. At the time of that prior testimony, were your  
23 credentials as a petroleum engineer accepted and made a  
24 matter of record?

25 A. Yes, they were.

1           Q.    Are you familiar with the Applications filed on  
2    behalf of Amoco in each of these consolidated cases?

3           A.    Yes, I am.

4           Q.    And are you familiar with each of the proposed  
5    horizontal wells?

6           A.    Yes.

7           MR. CARR:  Are the witness's qualifications  
8    acceptable?

9           EXAMINER STOGNER:  They are.

10          Q.    (By Mr. Carr)  Initially, Mr. Hawkins, it would  
11    be helpful, I think, if you could review for the Examiner  
12    the status of the Gartner well that Amoco has been  
13    attempting to drill as a horizontal well in this same  
14    general area in the Mesaverde formation.

15          A.    Sure.  The Gartner A 2R well has previously been  
16    approved by the Division, and -- for a horizontal drilling  
17    project.

18                We have recently moved the rig off of that well.  
19    We've drilled to a point where we've run into some problems  
20    and had to temporarily abandon the well.  But it was  
21    approved as a horizontal project in the Cliff House  
22    formation.

23                We were able to drill the well down to a point  
24    and make the turn to the 90 degrees and made some headway  
25    on the lateral when we -- we were encountering a lot of

1 difficulty in making footage per day and eventually twisted  
2 the cones off the bit in the horizontal lateral portion of  
3 the well, and we've had to back off.

4 But we have still identified a number of other  
5 candidates in the same general area that exhibit the same  
6 geologic characteristics that would make us want to  
7 continue to do horizontal projects in this general area.

8 Q. You've indicated you've temporarily abandoned the  
9 well. Is there a chance you would return to this well and  
10 attempt a horizontal completion with this wellbore?

11 A. Yes, there is. At this point we are evaluating a  
12 couple of different options.

13 One would be to attempt to sidetrack around the  
14 junk in the hole and try to maintain our lateral in the  
15 Cliff House.

16 Another option that we'd be looking at would be  
17 to go ahead and drop angle down from the build portion, and  
18 maybe go into the Menefee or the Point Lookout member of  
19 the Mesaverde.

20 One point I'd like to make is that the order that  
21 came out in that well was fairly restricted to the Cliff  
22 House, even though we had, you know, looked at that as just  
23 our primary objective.

24 There certainly can be more than one objective  
25 within the Mesaverde, and the things we'd like to make sure

1 we get in these orders if possible is some flexibility to  
2 take care of these kinds of problems in the event we need  
3 to make some changes or we see a need to enter another  
4 formation due to technical information that's obtained in  
5 the drilling of the well.

6 Q. When you say another formation, do you mean  
7 another portion of the Mesaverde?

8 A. Yes, I do. I mean any of these -- like the Point  
9 Lookout or potentially the Menefee within the Mesaverde as  
10 well.

11 Q. If you go back to the Gartner 2R, that would  
12 require coming back to the Oil Conservation Division to  
13 amend prior authority?

14 A. As far as I know, that's probably the remedy. I  
15 think we'll probably be exploring that with the OCD after  
16 -- outside of these cases.

17 Q. And it would be your intention to go forward with  
18 the wells that are the subject of the hearings today before  
19 you would come back with that well?

20 A. Yes, that's correct. We would like to see -- get  
21 some of the information from these offset wells to help us  
22 in our decision on what to do with that Gartner 2R well.

23 Q. It also would be helpful to have some success, to  
24 take that back to your management, would it not?

25 A. Certainly.

1 Q. Okay. Let's go to Exhibit Number 4. Let's go to  
2 exhibit book 11,051.

3 A. Okay.

4 Q. Could you identify and review it for the  
5 Examiner?

6 A. Yes, Exhibit Number 4 is a plat of the wells in  
7 this general area, the nine-section plat surrounding  
8 Section 26, where our Gartner A 8 well is located.

9 Each of those wells has been spotted here, and  
10 these are Mesaverde wells, and we've got some production  
11 information that's been listed beside the well. The top  
12 number is the cumulative gas recovery, and the bottom  
13 number is the expected ultimate recovery in BCF for each of  
14 the wells in this area.

15 I'd like to also point out, the black dot in the  
16 northwest corner -- or, excuse me, northeast corner of  
17 Section 26 is the A 8 well. It's just highlighted in that  
18 fashion so you can see which well we're going to re-enter.

19 Q. Some of the wells offsetting the proposed  
20 horizontal wellbores in fact have very high cumulative  
21 production figures; is that right?

22 A. That's correct. We think that the cumulative  
23 production figures for some of these wells that are in the  
24 10-BCF-plus range are indicative of wells that have  
25 encountered fracture systems in the Mesaverde.

1           For instance, in the southwest of Section 25  
2           there is a well that's indicated to have recovered  
3           approximately 25.9 BCF to date, with an expected ultimate  
4           recovery of about 32 BCF.

5           And then another well similar to that would be up  
6           in Section 22, in the far northwestern portion of Section  
7           22, shows a cumulative recovery of about 26 BCF with  
8           expected ultimate recovery of 44 BCF.

9           Both of those wells clearly indicate that they  
10          are connected to a very high-permeable fracture system to  
11          get that type of recovery.

12          There are some other wells in this area as well  
13          that are in the 9-to-10-BCF range, that are most likely  
14          connected to some fracture system. As you can look at the  
15          wells in the general area, you know, typically, you'll see  
16          a well that's -- one of the original horizons has recovered  
17          5 or 6, maybe 7 BCF, and the infill wells typically have  
18          recovered 1 to 2 BCF and are expected to recover maybe 3.

19          The A 8 well itself has actually been a fairly  
20          good well. But with the presence of fractures in the area  
21          and indications of 10-plus BCF potential, we feel like a  
22          horizontal well would be a good candidate in this spacing  
23          unit.

24          Q.   And if you're successful, you might even be able  
25          to obtain ultimate recovery figures comparable to some of

1 the higher offsetting wells?

2 A. That's right. I think what we're really trying  
3 to obtain is an incremental 2 to 3 BCF to make the project  
4 economic, and if we can get some more than that, I think  
5 that would be great.

6 Q. In your opinion, would the wells that you are  
7 proposing effectively drain the acreage dedicated to those  
8 wells?

9 A. Yes.

10 Q. Do you anticipate any drainage from the  
11 offsetting tracts?

12 Q. You would be staying at least a standard setback  
13 from those offsetting operators?

14 A. That's correct.

15 Q. Let's go back to Exhibit Number 2 in this book.

16 A. Okay.

17 Q. And working off the Exhibit 2 for Case 11,051,  
18 would you refer to that exhibit and then review for Mr.  
19 Stogner exactly how Amoco proposes to go about the drilling  
20 of the well, of each of these wells?

21 A. Yes. If you will take, again, a look at Exhibit  
22 2 and refer to the one-section plat that shows the  
23 orientation of the well, it shows a dark blue shaded  
24 section that gives you the orientation of the lateral that  
25 we expect to drill out of the A 8 well.



1           The -- We're a little bit restricted here by the  
2       edge of the 790-foot setback, but still have room to go,  
3       you know, at least 1500 to 2000 feet or more, within this  
4       project area setback.

5           The well right now would be planned to re-enter  
6       this well below the -- and come out of the 7-inch casing  
7       set at 4547, mill a window, and come down along the casing  
8       that's already in the well, with a kickoff point at about  
9       4790, and begin a medium-radius turn with an air motor  
10      system, drilling with air mist, and then enter the Point  
11      Lookout and drill horizontally, approximately 2000 feet.

12           We would plan to set a slotted liner in this  
13      lateral portion, tie back to the casing, and probably have  
14      no stimulation, hopefully be able to take a natural  
15      completion in this Point Lookout.

16           Q.    Now, with this tool, are you going to be able to  
17      control exactly where you're placing the wellbore as you  
18      drill?

19           A.    Yes.

20           Q.    Will you be surveying the well or otherwise aware  
21      of its exact location while drilling?

22           A.    Yes.

23           Q.    With this tool you will be able to stay back from  
24      the outer boundary of the project area, at least 790 feet?

25           A.    Yes.

1           Q.   And you will be able to confine the horizontal  
2           portion of the hole into -- in that portion of the  
3           Mesaverde formation which you're intending to test?

4           A.   That's correct.

5           Q.   At the end of the drilling of each of these  
6           wells, will there be a survey of the entire wellbore?

7           A.   Yes.

8           Q.   And will that be filed with the Oil Conservation  
9           Division?

10          Q.   Yes.

11          Q.   In your opinion, Mr. Hawkins, will approval of  
12          each of these Applications result in the recovery of  
13          hydrocarbons that otherwise would be left in the ground?

14          A.   Yes.

15          Q.   That would therefore prevent waste?

16          A.   Yes.

17          Q.   Will approval of these Applications also be in  
18          the best interest of conservation and the protection of  
19          correlative rights?

20          A.   Yes, they will.

21          Q.   Was the diagrammatic portion of Exhibit Number 2  
22          and Exhibit Number 4 in each of these exhibit packets  
23          either prepared by you or compiled under your direction?

24          A.   Yes, sir, they were.

25               MR. CARR:  At this time Mr. Stogner, we move the

1 admission of Exhibits 2 and 4 in each of the exhibit  
2 packets.

3 EXAMINER STOGNER: Exhibits 2 and 4 in each of  
4 the consolidated cases will be admitted into evidence at  
5 this time.

6 MR. CARR: That concludes my direct examination  
7 of Mr. Hawkins.

8 EXAMINATION

9 BY EXAMINER STOGNER:

10 Q. Mr. Hawkins, in all cases, whether it be a new  
11 drill or a re-entry in an existing well, will the casing be  
12 milled?

13 A. Well, if it's a new drill, we'll be just coming  
14 out of the intermediate casing and then drilling the curved  
15 portion itself. If we re-enter, we will be milling a  
16 window.

17 Q. Okay, and in all cases, a slotted liner, you say,  
18 will be utilized, tied back into the 7-inch casing, or the  
19 casing?

20 A. That is our current plan, yes.

21 Q. And are all these -- Except for new drills, are  
22 they all fitted with 7-inch casing?

23 A. I believe so. I'd have to take a quick look  
24 here, but as far as I recall, they're all 7-inch.

25 Q. And that slotted liner will be how the -- if it's

1 7-inch?

2 A. Well, it will probably be 4-1/2-inch if it's  
3 7-inch.

4 Q. Okay. What's Amoco's proposed plugging technique  
5 on these kind of wells once the well is dry and declared  
6 uneconomical? Has there been any thought of how these  
7 wells will be plugged and abandoned?

8 A. I'm not sure. I don't know if I can answer that  
9 question right now. I'm certain we will try to cement the  
10 zones that would prevent any migration of fluids and work  
11 with the Division to make sure that we adequately protect,  
12 you know -- seal off the reservoirs within this well.

13 But I don't -- I haven't -- I'm not real sure  
14 exactly what our procedure will be to plug this well.

15 Q. But it's Amoco's intent to plug it in such a  
16 manner as to protect correlative rights and to discuss any  
17 plugging techniques with the District Supervisor --

18 A. Yes.

19 Q. -- in Aztec at the time, or who knows where it  
20 will be when these things get ready to be plugged and  
21 abandoned?

22 A. Yes, that's correct.

23 Q. Because I see that Lindsey A Number 1A, there  
24 appears to be a lot of property lines in between that, such  
25 as that might be a concern, as it might not be in, say, the

1 Florance well where there are no -- where that's one solid  
2 lease.

3 But there again, that remains to be seen and get  
4 with the plugging program applicable at the time?

5 A. Yes.

6 Q. And at the end of drilling such horizontal well,  
7 a tabulation or a diagram of the actual wellbore can be  
8 submitted to the District and to the Division at the time?

9 A. That's correct, I think we could -- We're going  
10 to provide the directional survey information, and, you  
11 know, an actual wellbore trajectory to the Division.

12 Q. Are there any other projects planned by Amoco if  
13 these are successful in the Mesaverde?

14 A. Well, we're still evaluating many of the areas in  
15 this Mesaverde, and I would expect there will be future  
16 projects brought forward.

17 Q. In your opinion, even though it's not covered in  
18 this particular Application, would it be detrimental to the  
19 Division, might consider an administrative procedure either  
20 in this particular formation, or pool rather, and/or  
21 statewide rules for administrative procedures to approve  
22 such projects?

23 A. Amoco would support an administrative procedure  
24 to approve these horizontal wells, and we are familiar with  
25 the current program, I guess, that is evaluating the

1 administrative rules for horizontal wells.

2 We're working with Meridian, and I know they're  
3 working with other operators as well, to get some consensus  
4 on some rules to present to the Commission.

5 Q. And the Mesaverde formation that is subject to  
6 these applications are under prorationing right now; is  
7 that correct?

8 A. That's correct.

9 Q. And as far as the prorationing scheme, that is  
10 not to be changed in any of these proration units?

11 A. My understanding is, these wells, in determining  
12 allowables, the deliverability of this well would be used  
13 as one of the -- if there's more than one well, one of the  
14 wells within this proration unit, and the other well, the  
15 next highest well in the proration unit, would be the  
16 second well. Again, I'm assuming that these are going to  
17 be high-deliverability wells, successful.

18 Q. But other than that, Amoco is not proposing any  
19 special considerations for the allowable --

20 A. No.

21 Q. -- or the deliverability?

22 A. No, we're not.

23 EXAMINER STOGNER: No other questions of Mr.  
24 Hawkins.

25 MR. CARR: we have nothing further in this case,

1 Mr. Stogner.

2 EXAMINER STOGNER: Any other questions of this  
3 witness?

4 You may be excused.

5 Mr. Carr?

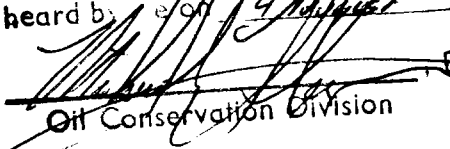
6 MR. CARR: We request the cases be taken under  
7 advisement.

8 EXAMINER STOGNER: Cases 11,051 through 11,056  
9 will be taken under advisement.

10 (Thereupon, these proceedings were concluded at  
11 11:25 a.m.)

12 \* \* \*

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21  
22 I do hereby certify that the foregoing is  
23 a complete record of the proceedings in  
the Examiner hearing of Case Nos. 1051 through 1105  
heard by me on 4 August 1956.

24  Examiner  
25 Oil Conservation Division

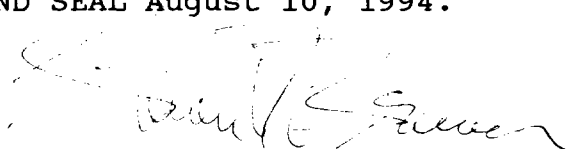
## 1 CERTIFICATE OF REPORTER

2  
3 STATE OF NEW MEXICO )  
4 ) ss.  
COUNTY OF SANTA FE )

5  
6 I, Steven T. Brenner, Certified Court Reporter  
7 and Notary Public, HEREBY CERTIFY that the foregoing  
8 transcript of proceedings before the Oil Conservation  
9 Division was reported by me; that I transcribed my notes;  
10 and that the foregoing is a true and accurate record of the  
11 proceedings.

12 I FURTHER CERTIFY that I am not a relative or  
13 employee of any of the parties or attorneys involved in  
14 this matter and that I have no personal interest in the  
15 final disposition of this matter.

16 WITNESS MY HAND AND SEAL August 10, 1994.

17  
18   
19 STEVEN T. BRENNER  
CCR No. 7

20  
21 My commission expires: October 14, 1994  
22  
23  
24  
25