

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCE DEPARTMENT
OIL CONSERVATION DIVISION

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IN THE MATTER OF:)
APPLICATION OF CONOCO, INC., FOR THE)
AMENDMENT OF ORDER NO. R-4691, AS AMENDED,) CASE NO. 10221
EDDY COUNTY, NEW MEXICO.)

-----)
IN THE MATTER OF:)
APPLICATION OF YATES PETROLEUM CORPORATION)
TO AMEND THE SPECIAL RULES AND REGULATIONS) CASE NO. 10222
FOR THE SOUTH DAGGER DRAW-UPPER)
PENNSYLVANIAN ASSOCIATED POOL, EDDY COUNTY,)
NEW MEXICO.)

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: Michael E. Stogner, Examiner

February 7, 1991

11:55 a.m.

Santa Fe, New Mexico

This matter came on for hearing before the Oil Conservation Division on February 7, 1991, at 11:55 a.m. at the Oil Conservation Conference Room, State Land Office Building, 310 Old Santa Fe Trail, Santa Fe, New Mexico, before Susan G. Ptacek, a Certified Court Reporter No. 124, State of New Mexico.

FOR: OIL CONSERVATION DIVISION BY: SUSAN G. PTACEK
Certified Court Reporter
CCR No. 1224

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February 7, 1991
Examiner Hearing
Case Nos. 10221 and 10222

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A P P E A R A N C E S

FOR THE DIVISION: ROBERT G. STOVALL, ESQ.
 General Counsel
 Oil Conservation Division
 State Land Office Building
 Santa Fe, New Mexico 87504

FOR CONOCO, INC. KELLAHIN, KELLAHIN & AUBREY
 Attorneys at Law
 BY: W. THOMAS KELLAHIN, ESQ.
 117 N. Guadalupe
 P.O. Box 2265
 Santa Fe, New Mexico 87504

FOR YATES PETROLEUM LOSEE, CARSON, HAAS & CARROLL, P.A.
CORPORATION Attorneys at Law
 BY: ERNEST L. CARROLL, ESQ.
 300 American Home Building
 P.O. Drawer 239
 Artesia, New Mexico 88211-0239

FOR NEARBURG CAMPBELL & BLACK, P.A.
PRODUCTION COMPANY Attorneys at Law
 BY: ANNIE LAURIE COOGAN, ESQ.
 110 North Guadalupe
 Santa Fe, New Mexico 87501

* * *

1 EXAMINER STOGNER: Hearing will come to order. Call
2 Case 10221.

3 MR. STOVALL: Application of Conoco, Inc., for
4 amendment of Division Order R-4691 as amended, Eddy County,
5 New Mexico.

6 EXAMINER STOGNER: Call for appearances.

7 MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the
8 Santa Fe law firm of Kellahin, Kellahin & Aubrey, appearing
9 on behalf of Conoco, Inc.

10 MR. CARROLL: Mr. Examiner, my name is Ernest Carroll
11 of the Artesia law firm of Losee, Carson, Haas & Carroll,
12 appearing on behalf on Yates Petroleum, who is making an
13 appearance in this hearing.

14 Mr. Examiner, I would also like to go on record
15 at this time, the following case of Case 10222, which is an
16 application by Yates Petroleum deals with the same subject
17 matter as Case No. 10221. Mr. Kellahin and I have
18 previously conferred, and we would think it would be in the
19 interest of time to consolidate both of these cases for
20 hearing at one time, because they are talking about the
21 same area and I think it would be the best use of time.

22 EXAMINER STOGNER: Are there any objections?

23 MR. KELLAHIN: No objection, Mr. Examiner.

24 EXAMINER STOGNER: At this time we will call Case No.
25 10222.

1 MR. STOVALL: Application of Yates Petroleum
2 Corporation to amend the special rules and regulations for
3 the South Dagger Draw-Upper Pennsylvanian Associated pool,
4 Eddy County, New Mexico

5 EXAMINER STOGNER: Mr. Kellahin, do you wish to enter
6 an appearance in this matter?

7 MR. KELLAHIN: Yes, sir.

8 EXAMINER STOGNER: I will call for any additional
9 appearances in either or both cases?

10 MS. COOGAN: In Case No. 10222 I'd like to enter my
11 appearance, Annie Laurie Coogan of the law firm of
12 Campbell & Black for Nearburg Production Company.

13 EXAMINER STOGNER: Do you have any witnesses?

14 MS. COOGAN: No.

15 MR. STOVALL: Do you have a card?

16 MS. COOGAN: Pardon me?

17 MR. STOVALL: I didn't get the name clearly

18 MS. COOGAN: Annie Laurie Coogan. C-o-o-g-a-n.

19 EXAMINER STOGNER: Are there any other appearances?

20 Mr. Carroll, Mr. Kellahin, who will start?

21 MR. CARROLL: I think Mr. Kellahin and I will -- there
22 is no real opposition, Mr. Examiner. We just want to
23 shorten things by presenting our testimony so it can be
24 considered together. I would also move with respect to our
25 presentation of our case 10222, we previously held -- the

1 hearing was held, I think, in October or November of last
2 year under Case No. 10108. An order was granted and that
3 order number was R-5353-L. We would move to adopt the
4 testimony which Yates presented at that hearing as our
5 basic case in chief for this particular hearing. The
6 evidence is the same as is still relevant, and I will put
7 on some testimony which will shore up that fact, that the
8 evidence that was presented during that case is still
9 relevant.

10 EXAMINER STOGNER: Are there any objections to making
11 Case 10108 a part of this matter?

12 MR. KELLAHIN: Mr. Examiner, Mr. Carroll informed me
13 prior to the hearing that he was going to make that motion.
14 After that I had independently reviewed the transcript and
15 the exhibits, while Conoco did not participate in that
16 case, we have no objection to having that matter
17 incorporated by reference into your decisions in both of
18 these cases.

19 EXAMINER STOGNER: Mr. Carroll, is that all right with
20 you?

21 MR. CARROLL: That is fine. The representations that
22 Mr. Kellahin made were correct; we did advise him of such
23 and there is no problem.

24 MR. STOVALL: Case 10108 will be incorporated in this
25 matter. How are we going to proceed on this?

1 MR. KELLAHIN: Let me suggest, Mr. Examiner, that I'm
2 happy to go forward with my presentation today if that's
3 all right with Mr. Carroll.

4 MR. CARROLL: I think that would be the best. We are
5 going to try not to duplicate the areas covered by
6 Mr. Kellahin's witnesses. And we have prepared a very
7 shortened form of testimony since we have been able to
8 incorporate our earlier testimony by reference, and we will
9 just try to fill in the gaps.

10 EXAMINER STOGNER: How many witnesses do you have,
11 Mr. Kellahin?

12 MR. KELLAHIN: I anticipate calling four witnesses.

13 EXAMINER STOGNER: And Mr. Carroll?

14 MR. CARROLL: Two witnesses.

15 MR. STOVALL: Just for the record, if I may,
16 Mr. Examiner, let's clarify what -- we all know what the
17 case is, but I think to have it make sense in the record --

18 MR. KELLAHIN: I propose to make an opening statement.

19 MR. STOVALL: Do you? So that will address those
20 questions.

21 EXAMINER STOGNER: Let's have the witnesses please
22 stand, be sworn at this time.

23 (Whereupon the witnesses were duly
24 sworn.)

25 EXAMINER STOGNER: Mr. Kellahin I believe has some

1 opening remarks at this time.

2 MR. KELLAHIN: Very briefly, Mr. Examiner. Conoco is
3 a major operator in what is called the North Dagger
4 Draw-Upper Penn pool. That pool is predominantly Cisco
5 production. The application on behalf of Conoco for the
6 North Dagger Draw is to ask the division to increase the
7 maximum oil allowable in that pool. The pool is based on
8 160 acres. We're at the 160-acre allowable currently set
9 for that pool, which is 350 barrels a day. This pool
10 operates under a gas/oil ratio limitation of 10,000 to 1.

11 We are seeking no change in the rules except to
12 have the division approve doubling oil allowable in a
13 spacing unit to 700 barrels a day maximum to be produced
14 out of any combination of wells within that spacing unit so
15 long as the total oil production from that combination of
16 wells within that spacing unit does not exceed the 700 a
17 day maximum. That's the change we want.

18 We have examined the possibility of downspacing
19 the pool. That is not possible because of the ownership.
20 Extensive engineering work has demonstrated conclusively to
21 the Conoco engineers and their tender of proof is that
22 based upon production, based upon pressure information,
23 based upon reservoir engineering calculations we are here
24 to represent to you and prove to you that we can increase
25 the oil allowable; it will prevent waste of oil reservoir

1 resources; it can be done without violation of correlative
2 rights.

3 On the southern end of this common source of
4 supply there has been created and developed what is called
5 the South Dagger Draw-Upper Penn pool. There are some
6 differences, but the wells need to be treated in similar
7 fashions. The South Dagger Draw was developed on 320
8 spacing. Again, it's impossible for those interest owners
9 to downspace. The complexities of ownership preclude that.
10 Yates is the major operator in that pool. The two pools
11 have a common boundary because of the one-mile rule.

12 The proof that Mr. Carroll presented back in
13 November demonstrates that, in fact, is one reservoir. Our
14 geology today will support that. And I think what Yates is
15 seeking is to have some compatibility so that the end
16 result is that everyone has the ability to take advantage
17 of an increased oil allowable. And we believe we've got a
18 method worked out for you that will demonstrate that we can
19 provide that flexibility to the operators and increase oil
20 production for both pools out of what in effect is one
21 common source of supply.

22 I'm going to give you four witnesses. Mr. Jerry
23 Hoover will give you a brief introduction on the background
24 on the pool. The substantive engineering witness is
25 Mr. Clyde Findlay. He will talk in detail about the

1 reservoir. We will supplement his engineering with a
2 geological witness to show you the geology, and then last a
3 landman to demonstrate the satisfaction of the notice
4 requirements for notice to interest owners, and that is our
5 presentation.

6 EXAMINER STOGNER: Thank you, Mr. Kellahin.
7 Mr. Carroll.

8 MR. CARROLL: I think, Mr. Examiner, that
9 Mr. Kellahin's portrayal of the issues before the examiner
10 are quite correct, and I have nothing to add or embellish
11 on that statement.

12 EXAMINER STOGNER: Thank you, Mr. Carroll.
13 Miss Coogan, do you have any opening remarks at this time?

14 MS. COOGAN: No, I don't.

15 EXAMINER STOGNER: Mr. Kellahin.

16 MR. KELLAHIN: At this time, Mr. Examiner, I would
17 like to call Mr. Jerry Hoover.

18 JERRY HOOVER,
19 the Witness herein, having been first duly sworn, was
20 examined and testified as follows:

21 DIRECT EXAMINATION

22 BY MR. KELLAHIN:

23 Q. Mr. Hoover, for the record, would you please
24 state your name and occupation?

25 A. I am Jerry Hoover. I work with Conoco,

1 Incorporated in Midland, Texas.

2 Q. You are a petroleum engineer by education?

3 A. That is correct.

4 Q. And you have practiced your profession for your
5 company for a number of years, have you not?

6 A. Yes, I have.

7 Q. Have you on prior occasions testified before the
8 division as a petroleum engineer?

9 A. Yes, I have.

10 Q. Have you made yourself familiar with the details
11 of your company's application before the division examiner
12 today?

13 A. I have.

14 MR. KELLAHIN: We tender Mr. Hoover as an expert
15 witness.

16 EXAMINER STOGNER: Are there any objections?

17 MR. KELLAHIN: None.

18 EXAMINER STOGNER: Mr. Hoover is so qualified.

19 Q. (By Mr. Carroll) Mr. Hoover, let me have you
20 unfold before you what is marked as Conoco Exhibit No. 1.
21 Do you have that?

22 A. Yes.

23 Q. Before I ask you to summarize what your company
24 wants to accomplish with this application and describe the
25 details, take a moment and identify the display for us.

1 A. This is a map showing all of the completions in
2 the Cisco formation in the North Dagger Draw-Upper
3 Pennsylvanian pool. This is complete at the drawing of
4 this map all of the wells that we are aware that are in
5 this pool and only those wells. You will notice the black
6 dotted line running around the larger area, that is the
7 NMOCD established boundary of the North Dagger Draw pool at
8 this point. The dotted red line is the outline of the
9 original pool as it was established in 1973 at the first
10 hearing. The orange arrows highlight the six wells that
11 were used in that original hearing to establish this pool.

12 Q. We have later displays that will show where the
13 North Dagger Draw fits into the South Dagger Draw?

14 A. Yes, in the geological presentation.

15 Q. At this point describe generally for the
16 examiner, so he will have that as a reference, where the
17 two pools come together?

18 A. South Dagger Draw pool is about a mile south of
19 the southern extent of this pool. If you look down at the
20 bottom left-hand corner of this exhibit, and you see the
21 extension down into Section 12 and Section 10 in Township
22 20 South, Range 24 East, about a mile further south you
23 will -- it is the boundary of the South Dagger Draw pool.

24 Q. And then below South Dagger Draw you run into
25 the Indian Basin?

1 A. That's correct.

2 Q. When we look at the North Dagger Draw-Upper
3 Penn, have you gone back and researched what has been the
4 sequence of examiner or division orders that have directed
5 and provided structure to the operators and working
6 interest owners for the development of that pool?

7 A. Yes, I have, and we have summarized those
8 briefly for you; those hearings which relate strictly to
9 spacing and allowable changes.

10 Q. And have you done so and prepared that in the
11 form of a display?

12 A. Yes, that's Exhibit 2.

13 Q. Let's look at Exhibit No. 2. Without reading
14 the specific details, Mr. Hoover, give us a chronology of
15 the development in the pool?

16 A. In 1973 Roger Hanks, who was the
17 operator/developer of the original pool as outlined in red
18 on the map, came to that commission asking for this pool to
19 be established. He had those six original wells that he
20 presented at that time in support of establishing that
21 pool. He asked for 320-acre spacing with a 427-barrel per
22 day allowable at that time. His only justification for the
23 spacing at that time was that these wells were producing
24 with a high water cut and from an operational expense, he
25 did not feel like he could afford to develop on smaller

1 spacing.

2 Q. You have identified on Exhibit No. 1 the first
3 Roger Hanks six completions with red arrows?

4 A. That's correct.

5 Q. What happened then?

6 A. The original rules were issued as temporary
7 rules, with call for review several years later, and in
8 1976 the case was reopened to see if these rules should be
9 stand or they should be changed, and Roger Hanks came back
10 and requested downspacing to 160-acre spacing. His only
11 technical presentation at this hearing was a bottom survey
12 in one of the original wells, which he brought to the
13 commission, and stated that in three years of operation
14 this pressure test extrapolated back to within 100 pounds
15 of the original pressure, so his assumption from that was
16 that he was not efficiently draining the large areas that
17 he thought he might.

18 Q. What happened then?

19 A. So the order was amended. This was 4691-A.
20 Later in the same year, September of 1976, Hanks came back
21 again and requested an increase in the allowable up to 350
22 barrels per day. His statement was that he had several
23 wells which were producing higher than the 267 that had
24 been given in 4691-A, and also several new wells that he
25 had drilled were initially coming in above that allowable

1 so he asked for the increase to 350 barrels of oil per day.
2 This was granted in Order 4691-B. That's the last change
3 in the rules.

4 Q. With regards to well spacing and --

5 A. And allowable.

6 Q. And allowable?

7 A. That's correct.

8 Q. After that the commission adjusted the gas/oil
9 ratio?

10 A. That is correct.

11 Q. And they currently -- what is the gas/oil ratio
12 limitation for the North Dagger Draw at this point?

13 A. 10,000.

14 Q. You're not seeking a change in that?

15 A. No, we're not.

16 Q. What is the one rule that you are seeking to
17 have changed?

18 A. The oil allowable is the only change we're
19 asking.

20 Q. Without going into the specific details,
21 describe for us the reason Conoco is seeking to have that
22 accomplished?

23 A. As the engineering justification will show we
24 feel like that we have not been efficiently and in a timely
25 manner depleting this reservoir. And as was stated in the

1 opening remarks, the most logical thing to do would be to
2 call for a downspacing but that is a complicated land
3 problem that we do not feel is -- could be worked out. So
4 we simply are asking the commission to work with us in
5 establishing a manner of increasing the well density
6 without going through the land changes.

7 MR. KELLAHIN: That concludes my introductory remarks
8 for Mr. Hoover. We will move the introduction at this time
9 his Exhibits 1 and 2.

10 MR. STOVALL: Are there any objections to Exhibits 1
11 and 2?

12 MR. CARROLL: None.

13 EXAMINER STOGNER: Exhibits 1 and 2 will be admitted
14 into evidence.

15 (Conoco Exhibits 1 and 2 were
16 admitted in evidence.)

17 EXAMINER STOGNER: Mr. Carroll, your witness.

18 MR. CARROLL: I have no questions.

19 EXAMINER STOGNER: Miss Coogan, your witness.

20 MS. COOGAN: No questions.

21 EXAMINATION

22 BY EXAMINER STOGNER:

23 Q. Mr. Hoover, at this time this pool that you
24 mentioned having a GOR limitation of 10,000 to 1.

25 A. That is correct.

1 Q. Has that always been so?

2 A. That was changed in a ruling in 1977.

3 Q. What order would that be?

4 A. Tom has that order. That was order number
5 R-5565 on 11-1-77.

6 Q. R-5565?

7 A. That's correct.

8 MR. KELLAHIN: Here's a copy of that order,
9 Mr. Examiner.

10 Q. (By Examiner Stogner) I will pose this question
11 now to you, Mr. Hoover. Do you know of any other rules
12 pertaining to the North Dagger Draw Pennsylvanian pool? It
13 looks like it started out as Order R-4691.

14 A. That is correct.

15 Q. I didn't even know about that.

16 A. Amended by A and B and made permanent by C.

17 EXAMINER STOGNER: Let's move on with it, and I don't
18 have any more questions of Mr. Hoover at this time, but we
19 may have some at a later point.

20 MR. KELLAHIN: I'd like to now call Clyde Findlay.

21 EXAMINER STOGNER: Mr. Kellahin.

22 MR. KELLAHIN: Mr. Examiner, Mr. Findlay displays are
23 bound in the red binder of the engineering exhibits.

24 CLYDE FINDLAY,

25 the Witness herein, having been first duly sworn, was

1 examined and testified as follows:

2 EXAMINATION

3 BY MR. KELLAHIN:

4 Q. For the record, sir, would you please state your
5 name and occupation?

6 A. My name is Clyde Findlay. I'm a petroleum
7 engineer for Conoco, Inc., in Midland, Texas.

8 Q. Mr. Findlay, on prior occasions have you
9 testified before the division as a petroleum engineer?

10 A. No, sir.

11 Q. Summarize for us your education?

12 A. I have a bachelor in science degree from Texas
13 A & M University.

14 Q. In what year, sir?

15 A. Petroleum engineering in 1985.

16 Q. Subsequent to graduation summarize your
17 employment experience as an engineer?

18 A. I have worked the last three years as Conoco's
19 Dagger Draw production engineer.

20 Q. As a production engineer describe for us the
21 kinds of things that you're asked to do?

22 A. Basically all phases of engineering at Dagger
23 Draw from drilling, to production, facility work, et
24 cetera.

25 Q. As a result of that three years of effort have

1 you familiarized yourself with the production information
2 available not only for the North Dagger Draw but the South
3 Dagger Draw as well?

4 A. Yes, sir.

5 Q. Are you familiar with the producing capacities
6 of those wells?

7 A. Yes, sir.

8 Q. You made yourself familiar with the pressure
9 information?

10 A. Yes, sir.

11 Q. Based upon available data have you interpreted
12 and applied conventional engineering techniques to
13 determine whether or not in your opinion you had sufficient
14 information to reach a conclusion about the increase in oil
15 allowable that's been applied for today?

16 A. Yes, sir.

17 Q. Have you reached such a conclusion?

18 A. Yes, sir.

19 MR. KELLAHIN: We tender Mr. Findlay as an expert
20 petroleum engineer.

21 EXAMINER STOGNER: Are there any objections?

22 MR. CARROLL: None.

23 EXAMINER STOGNER: Mr. Findlay is so qualified.

24 Q. (By Mr. Kellahin) Describe for us, with your
25 background, Mr. Findlay, what the problem was that you saw

1 with the existing rules that has caused your company to
2 come forward and ask this division to increase the oil
3 allowable?

4 A. We have found through infill drilling at Dagger
5 Draw that a downspacing -- not downspacing but increased
6 well density is appropriate for the Dagger Draw area, and
7 to accommodate this additional allowable is required for
8 subsequent infill drilling.

9 Q. Based upon your study, what is your opinion
10 about the abilities of a single well in 160 acres to
11 effectively and efficiently produce the oil as a single
12 well within that spacing unit?

13 A. My opinion is that individual wellbores in
14 Dagger Draw are not draining 160-acre proration units.
15 They're in fact draining much smaller drainage radiuses.

16 Q. Having reached the conclusion that we should
17 increase the oil allowable, are you comfortable with the
18 recommendation of a maximum of 700 barrels of oil per day
19 160 spacing unit?

20 A. Yes.

21 Q. What's the basis, the rationale, for suggesting
22 700 a day as opposed to some other number?

23 A. As I will go into testimony later, we're finding
24 that additional wells are acting almost independently of
25 the original wells with production, pressure histories, et

1 cetera, that equal or better than the original wells, and
2 therefore the allowable for the original wells should be
3 applied to the additional wells to allow the additional
4 density in the existing proration units.

5 Q. Rather than downspace from 160 to 80 acres, for
6 example, your proposal then to accomplish that effect is by
7 doubling the oil allowable?

8 A. That's correct.

9 Q. What would be your plan of operation with
10 regards to how to produce the individual wells within the
11 160 up to this ceiling?

12 A. Of course, we would drill additional wellbores
13 up to the point to where we reach the 700 barrel a day
14 allowable.

15 Q. Describe for me the basic ultimate reasons that
16 have caused you to reach this conclusion?

17 A. There are three technical reasons that we would
18 like to address that provide substantial evidence that the
19 existing well density is too small. First, additional
20 wells on 160-acre proration units are producing as good or
21 better than the original wells, so from a production
22 history point of view, we're seeing evidence of this. New
23 wells on 160-acre proration units encounter higher
24 bottomhole pressures than would be expected if the original
25 wells had effectively pressure-depleted the units. And

1 third, recent technology indicates that higher porosity
2 values and thicker pay sections are the fact rather than
3 the original estimates. Therefore, actual drainage
4 radiuses are smaller than the original estimates.

5 Q. Let's go to your exhibit book now, Mr. Findlay,
6 and have you turn to what is marked as Exhibit 3. There is
7 a cover sheet, there is a tabulation of exhibits, and then
8 we're into Exhibit 3. Do you have that before you?

9 A. Yes.

10 Q. In analyzing the North Dagger Draw, did you
11 determine whether or not you could conduct your analysis by
12 dividing out the pool into separate specific areas?

13 A. Yes.

14 Q. Have you done that?

15 A. Yes.

16 Q. Describe for us then what is identified on this
17 display with the four dashed green areas?

18 A. This map represents Conoco's operations in the
19 North Dagger Draw pool. The four areas outlined in green
20 are the areas which have been investigated in my testimony,
21 with the bulk of the testimony being in the Barbara Federal
22 area to the north and then additional examples being in the
23 center of the map with the Parish IV and Dagger Draw wells,
24 and then at the bottom of the map with the Dee State wells.

25 Q. Give us a way to characterize each of the four

1 areas and why you have selected each one independently to
2 integrate into your analysis?

3 A. The Barbara Federal area in the -- on a
4 well-by-well basis the area of the reservoir with the most
5 development and the oldest wells. Therefore, the most data
6 is available in this area of the reservoir, and that's what
7 I will concentrate on just basically for data reasons.

8 The center of the map is new development that
9 shows drilling potential of Dagger Draw. And the Dee State
10 area to the south is a good example of remedial potential
11 in the Dagger Draw area. But I wanted to incorporate areas
12 throughout the North Dagger Draw to show that we're not
13 dealing with isolated phenomena Barbara Federal area.

14 Q. Let me have you turn to Exhibit No. 4. Would
15 you identify this display?

16 A. Yes, this is a production map of the Barbara
17 Federal area which is on the north end of your location
18 map. This is Section 17 and 18. There are -- these
19 sections are divided into 160 proration units as you can
20 see by the large dashed lines. The original wells drilled
21 in this area are indicated by the black dots, which is what
22 Roger Hanks drilled back in the mid-'70s, and the
23 subsequent infill development is indicated by the red dots,
24 which has taken place in the last two years.

25 Q. The legend at the lower right of the display

1 identifies what for us, Mr. Findlay?

2 A. That is production information, both initial
3 potential and cumulative production, for the wells. On the
4 top half of the cross hairs in your legend is IP
5 information and the date of the IP, and of course that's
6 next to each well. Then on the bottom of the cross hairs
7 is cumulative production information. It's important to
8 note that all the original wells in black have now been
9 plugged. They were plugged in the mid-'80s, so you can
10 consider this cumulative information for the plugged wells
11 to be ultimate recovery.

12 Q. Let me direct your attention to the center of
13 Section 18, out of center and each 40-acre adjoining tract
14 there is now or has been in the past a North Dagger Draw
15 well?

16 A. That's correct.

17 Q. Are those on effective 40-acre spacing?

18 A. In this area of the reservoir that can be
19 considered 40-acre spacing.

20 Q. Has that drilling been too dense?

21 A. Not in our experience.

22 Q. Why not?

23 A. If you will look at the production numbers for
24 the old wells versus these new wells we have come in and
25 drilled, you will see this, initial production rates are

1 basically as good or better than the original wells. In
2 addition, the cum information to date on the new wells
3 indicate that the ultimate recovery will be as good or
4 better than the original wells in the area.

5 Q. From the analysis of the production information
6 available what conclusion do you reach as an engineer?

7 A. That just from a production history point of
8 view, that the original wells did not effectively drain
9 these 160-acre proration units because of the new
10 production we're seeing on infill drilling. In other
11 words, the new wells are performing as well or better than
12 the original wells.

13 Q. Show us in this particular area the relationship
14 with the current maximum allowable on 160s of 330 a day.
15 Do the current producing wells on any of those spacing
16 units in the Barbara Federal area have the capacity to
17 exceed that number?

18 A. In this particular area of the reservoir we have
19 no wells at this time that exceed 350 barrels a day.
20 However, we do have some wells that are very good wells,
21 250 to 300 barrels a day.

22 Q. For this particular area or areas of the pool
23 that represent the Barbara Federal area characteristics,
24 what will you do to meet the unused allowable in that
25 spacing unit?

1 A. Drill additional wellbores.

2 Q. Is there enough margin of difference in these
3 spacing units to cause you to have the economic incentive
4 to drill additional wells?

5 A. Can you repeat.

6 Q. Yes, sir. Is there enough margin of difference
7 for the unused allowable in these spacing units --

8 A. Yes.

9 Q. -- to provide an economic incentive for Conoco
10 to drill another well?

11 A. Yes, sir.

12 Q. That's part of the plan, isn't it?

13 A. Yes.

14 Q. Let's turn now to Exhibit No. 5. Identify that
15 for us.

16 A. This is a production history graph of the
17 Barbara Federal No. 1 with daily rates versus time. There
18 are three curves. The gas is indicated in blue, the water
19 in red, and the oil in green.

20 Q. Give us an overview of the Cisco reservoir,
21 including the South Dagger Draw and the North Dagger Draw
22 in terms of what you as a reservoir engineer see as the
23 drive mechanics of the reservoir?

24 A. Yes, sir. This is a -- that's the reason I show
25 this exhibit, just to establish the producing mechanism of

1 Dagger Draw. As you can see the oil and gas rates are
2 declining exponentially in this graph, with the water rates
3 remaining relatively constant.

4 Q. Let's take a moment. We've got water displayed
5 in red which is not usually what we do; right?

6 A. That's correct.

7 Q. So water is in red; the oil is in green, and
8 we've got gas in what, purple. Whatever that color is.

9 A. Blue.

10 Q. Tell me what it shows.

11 A. It shows that the well produced for a period of
12 10 years. It declined exponentially on oil and gas rights.
13 However, the water stayed relatively constant. We
14 interpret this to indicate a predominant solution-gas-drive
15 producing mechanism with a weak water influx.

16 Q. You have reviewed the Yates presentation, their
17 transcript and exhibits from the November hearing, did you
18 not?

19 A. Yes, sir.

20 Q. One of the items of discussion is whether or not
21 we had a strong enough water drive component to the
22 reservoir; that we needed to be careful about how fast we
23 pulled the oil wells.

24 A. We have not seen -- we have not seen that
25 phenomena in North Dagger Draw.

1 Q. You and Yates are then in agreement that we
2 don't have to be concerned about increasing water cuts if
3 we increase the allowables?

4 A. That's correct.

5 Q. You don't see any evidence from your perspective
6 that would give the examiner pause about increasing the
7 allowable because we're going to have a water problem?

8 A. No, sir. As a matter of fact, the key I really
9 think to these wells is to draw them down at a very high
10 rate to allow the matrix to contribute in the dolomite.
11 Actually as we draw wells down, we tend to get better water
12 cuts.

13 Q. Increased allowable would give you that
14 flexibility then?

15 A. That's correct.

16 Q. Then you and the Yates engineer are in agreement
17 on that aspect, are you not?

18 A. Yes, sir.

19 Q. Let's talk about the water itself for another
20 moment. Do most of these wells in the Cisco in both North
21 Dagger Draw and South Dagger Draw produce some produced
22 water?

23 A. Yes, that is a common characteristic of the
24 Dagger Draw wells. There is no water-free production in
25 Dagger Draw, and they all have water associated with the

1 production.

2 Q. Let's turn to the topic of the gas. Do you see
3 or perceive a problem with disproportionately climbing
4 gas/oil ratios if the examiner approves the allowable
5 increase for the North Dagger Draw?

6 A. No, sir, I haven't. That's something that you
7 can see in the initial potential of some of the original
8 wells in Dagger Draw. The gas/oil ratios don't seem to be
9 any higher at the higher rates, than when they stabilized
10 at the lower rates.

11 Q. Do you have any indication that we will create a
12 secondary gas cap in North Dagger Draw if we increase the
13 allowable and therefore increase the gas withdrawal rates
14 from the reservoir?

15 A. No, sir.

16 Q. Are there any gas wells in either pool?

17 A. Yes, there are.

18 Q. What's the explanation for their occurrence?

19 A. Most of those wells occur very high on the
20 structure, and there is a -- somewhat of a transition zone
21 between oil and gas as you move up structure. And it's
22 basically a structural phenomena.

23 Q. When we compare the North Dagger Draw to the
24 South Dagger Draw, is there any general comparisons or
25 explanations that you see that create some type of

1 difference?

2 A. They both have very similar rock properties.
3 The reservoir is very continuous from north to south.
4 However, as a general trend it could be shown that South
5 Dagger Draw is probably higher on structure than North
6 Dagger Draw.

7 Q. Do you see their wells with a little higher
8 gas/oil ratio than you do in your wells?

9 A. Yes, as you get down into the South Dagger Draw
10 there are higher gas/oil ratios.

11 Q. Do you see a problem for any group of operators
12 in either pool staying within the 10,000 to 1 gas/oil ratio
13 limitation?

14 A. Not at this time.

15 Q. Your conclusion then about the drive mechanism
16 for the reservoir is what?

17 A. Predominantly solution-gas drive with a weak
18 water influx.

19 Q. Let's turn to Exhibit No. 6. Would you identify
20 that for us?

21 A. This again is a production history of the -- of
22 a well just south of the well we just looked at in the
23 southeast quarter of Section 18, the Barbara Federal No. 6.
24 Once again, you have data production rates versus time.
25 The colors are different on this one. The oil is in green;

1 the gas is in red; and the water is in blue which is more
2 typical of what you're used to seeing. But once again --

3 Q. What's the major point?

4 A. Once again, I'm trying to establish that there
5 is a predominantly solution-gas-drive mechanism with a weak
6 water influx. We see the same trends in this well as we
7 saw on the Barbara 1. Oil and gas declining exponentially
8 with a water rate basically remaining level over time. Of
9 course, this well produced for about 11 years to an
10 economic limit. I just wanted to verify the
11 solution-gas-drive mechanism.

12 Q. Let's turn to Exhibit No. 7. What is this
13 display?

14 A. This is a display of two wells drilled on the
15 same proration unit in the northeast quarter of Section 18.

16 Q. You've got the number 1 in the southeast of the
17 northeast?

18 A. That's correct.

19 Q. And then east of that in the 40-acre offset sits
20 the number 9?

21 A. I guess west of it.

22 Q. I'm sorry, west of that one is the number 9?

23 A. Yes.

24 Q. What's the comparison?

25 A. This is an oil rate only for the two wells. As

1 you can see the original Barbara Federal No. 1 was drilled
2 in 1971 and produced to, oh, approximately 1982, to an
3 economic limit. And the well was then plugged and
4 abandoned in the mid-'80s. We came back and drilled the
5 Barbara Federal No. 9 in the beginning of 1990. And from
6 the initial results the well appears to be as good or
7 better from production point of view as the original well.

8 Q. Let's look at the original well now. When we
9 look at time scale on the bottom, the horizontal scale, on
10 the bottom of the display --

11 A. Yes.

12 Q. -- by mid-'81 you have plugged the Barbara
13 Federal 1 or someone has?

14 A. The well was shut in in 1981 and ultimately
15 plugged in 1985.

16 Q. Was it produced to its economic limit?

17 A. Yes, it was, to a rate of -- approximately 25 to
18 30 barrels a day.

19 Q. A number above the initial potential you have a
20 pressure number?

21 A. Yes.

22 Q. What's that?

23 A. That's the initial pressure of the well when it
24 was drilled in the early '70s, and most of the wells in
25 that Barbara Federal area had initial pressures of about

1 3,000 pounds. I also list initial pressure for the Barbara
2 Federal No. 9, 20 years later, at about 1700 pounds.

3 That's the second part of my testimony.

4 Q. Let me come back to that in a minute.

5 A. All right.

6 Q. If the Barbara Federal 1 is effectively and
7 efficiently depleting the 160 acres dedicated to it, --

8 A. Yes.

9 Q. -- would you have expected to see producing
10 rates in the Barbara Federal 9 in 1989 that you saw?

11 A. No, sir, I would not have.

12 Q. Why not?

13 A. If the well effectively depleted the proration
14 unit, you would expect a depleted Barbara Federal No. 9
15 with very little capacity at that location. As you can see
16 IP is actually as good or better than the original IP.

17 Q. Only 40 acres away?

18 A. That's correct.

19 Q. What's the next point, the pressure?

20 A. Yes. If I could I defer that for just a second?

21 Q. Yes, sir. We have looked at the production in
22 terms of rate. Now let's look at the pressure, and I think
23 that's on Exhibit 8.

24 A. It's another production example and pressure
25 there too.

1 Q. Draw the relation for us on pressure now?

2 A. Once again -- this is the next proration unit to
3 the south of the one we just looked at. Once again you see
4 that -- the production history of the Barbara Federal No. 6
5 on the left drilled in '76, produced until 1987 and plugged
6 at that point.

7 Q. We're still in Section 18?

8 A. That's correct, southeast quarter.

9 Q. Southeast quarter of the No. 6 is in the
10 northwest of the southeast?

11 A. Yes.

12 Q. The comparison then is with the 40-acre diagonal
13 offset, Barbara Federal No. 8?

14 A. That's correct.

15 Q. Tell us what it shows.

16 A. Once again, the Barbara Federal No. 6 started at
17 a very respectable rate and produced apparently through
18 solution-gas drive, through a 11-year period and was
19 produced in an economic limit again of about 30 barrels a
20 day. It was plugged in 1988. We came back in and drilled
21 a Barbara Federal No. 8 on the same acreage, and had -- as
22 you can see from the performance curve, a performance that
23 is almost identical to the original. The IPs are roughly
24 the same, a little bit smaller in the Barbara Federal 8 but
25 certainly very respectable performance to date. This,

1 again, is good evidence that increased well density is
2 appropriate just from a production history point of view.

3 Q. Apart from the production history, can you make
4 the comparison for us on pressure?

5 A. Yes. As you can see the initial pressure on the
6 Barbara Federal No. 6 was recorded at about 2200 pounds,
7 2300. The well within the first three years had declined
8 to about 1128 pounds, about half the original pressure,
9 which is indicative of solution-gas drive. And the
10 pressure was not measured at abandonment, but one had to
11 estimate, I would estimate it would be no higher than 500
12 pounds.

13 Then the Barbara Federal No. 8 was drilled
14 subsequently, almost 20 years later, and we had an initial
15 pressure of within 600 pounds of the original discovery
16 pressure of the No. 6. So I think this kind of leads into
17 the idea that pressure history also justifies increased
18 well drilling.

19 Q. Have you surveyed the available bottomhole
20 pressure information within the Barbara Federal area?

21 A. Yes, sir.

22 Q. Let's turn to that display. It's Exhibit No. 9.
23 Do you have that?

24 A. Yes.

25 Q. Again, the same color code, the original wells

1 are in black, the infill wells are in red?

2 A. Yes.

3 Q. You have tabulated the bottomhole pressure for
4 each?

5 A. Yes.

6 Q. What is the conclusion?

7 A. The conclusion is that the original wells had
8 discovery pressures of around 3000 pounds. They pressured
9 depleted through their performance history. They were
10 plugged in the mid-'80s. New wells have subsequently been
11 drilled on the same 160-acre proration units, and pressures
12 much higher than one would have expected have been
13 encountered. The conclusion is that the original wells did
14 not effectively pressure deplete the 160-acre proration
15 units.

16 Q. In trying to describe the reservoir so that you
17 can do some basic volumetric calculations, did you go back
18 and analyze what would have been the information available
19 to Roger Hanks and to people in the '70s when they're
20 trying to set a spacing and determine what this reservoir
21 will do with well density. Have you done that?

22 A. Yes, sir.

23 Q. Let's turn to Exhibit No. 10, and have you
24 describe for us hat you have done here.

25 A. I took the original 1976 pool rule assumption of

1 160-acre drainage radiuses. I plotted it over again the
2 original wells in black, and the original -- and the new
3 wells in red, of course, are also featured on this map. I
4 simply want to demonstrate two things from this plot. Once
5 again, these drainage radiuses, of course, are in green.

6 First that the original wells would have to had
7 severe interference with each other to have 160-acre
8 drainage radiuses, and we know this isn't the case from the
9 very good cums we have seen of the original wells, 2 to
10 300,000 barrels of oil. And second, these new wells that
11 we infilled drilled with, some on as close as 40-acre
12 spacing, would have been depleted when we drilled them;
13 and, of course, we know that not to be the case.

14 So it's just a demonstration that the original
15 160-acre drainage pattern seemed to have been physically
16 impossible with the results that we have seen.

17 Q. Did you explore whether or not Hanks and others
18 when originally completing these wells may have simply
19 missed perforating the correlative interval that you're
20 finding in the infill location, and because of inadequate
21 methods of completion utilized at that time their wellbores
22 could have in effect drained wider areas had they done a
23 better job?

24 A. Yes, I have examined that.

25 Q. What did you find?

1 A. I found that the original wells probably drained
2 a much thicker pay interval than what was originally
3 assumed, using the available technology at the time, and
4 that the porosities were much higher than what was
5 originally assumed using the logging techniques available
6 at the time. So I think the original wells did drain a
7 smaller drainage radius than is indicated by this, and I
8 would like to show that technology change.

9 Q. As we move from the original to an infill
10 40-acre offset then, you're not seeing new zones, if you
11 will, in the infill well?

12 A. No. We would like to show --

13 Q. Exhibit No. 11?

14 A. Yes.

15 Q. Do you have Exhibit No. 11?

16 A. Yes.

17 Q. Let's have you draw a comparison between the
18 Barbara Federal 1 and the No. 9, so we can see the
19 correlative interval involved.

20 A. Okay. This is a cross section of the Cisco
21 Penn. On the left -- once again we're up in the Barbara
22 Federal 1 and Barbara Federal 9 area, in the northeast
23 quarter of Section 18. On the left it's the porosity log
24 from the Barbara Federal No. 1, and the on the right is the
25 porosity log from the Barbara Federal 9.

1 Included in these porosity logs on the depth
2 track is the completion information; or, in other words,
3 the perforated intervals of both wells. The first
4 conclusion you can make is that equivalent zones were
5 perforated. As you can see in the 9 there was less
6 dolomite left for perforation.

7 The second conclusion you can draw from this is
8 that using the technology of available time, in other words
9 these porosity logs, the porosity peaks were perforated by
10 Roger Hanks originally, and that was considered his net
11 pay. If you will look at the bottom of both logs, it shows
12 the number of holes.

13 Basically Roger Hanks would have calculated
14 about 50-foot net pay thickness in this well, and from
15 examination of the porosity values, about a 6 percent
16 average porosity throughout the dolomite.

17 Q. If you're using those values for your volumetric
18 calculation, that would give you the hypothetical drainage
19 radius of how many acres?

20 A. It would match very well with a 160-acre
21 drainage pattern if this calculation was made in 1976 with
22 the available technology.

23 Q. But you know by your own experience that that is
24 not a correct assumption of drainage areas?

25 A. That's correct.

1 Q. So there is something in that calculation that
2 is not correct?

3 A. That's right.

4 Q. And you examined porosity?

5 A. That's correct.

6 Q. How did you do that?

7 A. Can I say one thing before we go to the next
8 exhibit?

9 Q. Yes.

10 A. I just want you to note that on the Barbara
11 Federal No. 9 to the right that you're looking at a
12 perforated interval that is blanket perforated, just shot
13 continuously throughout entire dolomite. So I think we're
14 working towards the point that our concept of pay thickness
15 actually is greater now than what it was originally.

16 Q. Turn to Exhibit No. 12 for us now,
17 Mr. Findlay. Recognizing that volumetric calculations
18 using Mr. Hanks' parameters is not going to match your
19 field data, you needed to do something, and one of the
20 things to do is examine porosity; is that right?

21 A. That's correct.

22 Q. How did you go about doing that?

23 A. We used some new technology at Dagger Draw
24 called an imaging log. And this is an example of an
25 imaging log in the Barbara Federal No. 8 in the southeast

1 quarter of Section 18.

2 Q. Let's draw a quick comparison, a conventional
3 tool, the standard tool, represents how many degrees within
4 the wellbore?

5 A. A conventional tool, porosity tool, that runs
6 through a wellbore investigates a radius of 15 to 30
7 degrees as it travels up the wellbore. Therefore, it just
8 samples a small section of the bore hole wall as it travels
9 up the wellbore. This particular log examines a 360-degree
10 radius. In other words, the full spectrum of the wellbore
11 as it travels up the hole.

12 Q. The representation then is to take the circle
13 and flatten it out on the display?

14 A. That is correct. This is basically an acoustic
15 image of the dolomite as you travel up through the
16 wellbore. On the left side is a porosity track -- I'm
17 sorry is a depth track. In the middle and right sides are
18 images of the actual wellbore. Once again, a 360-degree
19 image that is actually peeled out, if you will, and laid
20 flat so you can examine this in two dimensions.

21 Q. Does the acoustic imaging log give you a compass
22 orientation so you know what the direction you're looking
23 at when you analyze the log?

24 A. Yes, it is oriented to north, with zero degrees
25 being on left and 360 degrees again being on the right, so

1 it makes the full circle of a compass.

2 Q. When we're looking at the left portion of the
3 representation and the right, what's the difference?

4 A. The left track represents the amplitude of the
5 sound wave that is used to generate this log. In other
6 words, the strength of the sound wave coming back. The
7 right track is the travel time of that sound wave used to
8 generate this picture, and it's a function of how far the
9 sound wave has to travel, and then reflect and bounce back.
10 In simple terms the middle image represented on this log is
11 a picture of the formation. The dark spots appearing on
12 this log indicate either a void, a hole, or a different
13 rock type than the surrounding matrix.

14 To verify depth or more porosity, which is what
15 we're looking for, you look on the right track to the
16 travel time, and if you see the same dark image appearing
17 there, that indicates a longer travel time; or, in other
18 words, porosity in the formation.

19 Q. Based upon your study, what in your opinion is
20 an accurate porosity value to use in the volumetric
21 calculations?

22 A. Our geologists have examined this imaging log
23 and they estimate from a visual image that there is an
24 additional 6 percent secondary porosity. In other words,
25 these holes appearing in the imaging log, in addition to

1 what those traditional logs read.

2 Q. Do you use this procedure to give you a more
3 accurate indication of the height component to use in the
4 volumetric calculation?

5 A. That's correct. This log showed us two things.
6 First of all, it showed us porosity, which is very
7 remarkable in this section of the log because it showed a
8 zero percent density-neutron porosity with standard tools.
9 So it showed us an increased porosity. Now our porosity
10 estimates have gone from 6 percent to 12 percent. It also
11 showed us in areas adjacent high porosity readings that we
12 have a thicker pay interval. In other words, there is
13 dolomite contributing to these ultimate reserves than what
14 was originally thought by Roger Hanks.

15 Q. Let's turn to Exhibit No. 13 now, Mr. Findlay.
16 If we're dealing with the Barbara Federal No. 1 well, we
17 know that well was produced to abandonment and you know
18 what the reported definitive oil production is; is that
19 right?

20 A. That's correct.

21 Q. What number did he have?

22 A. 272,000 barrels of oil.

23 Q. If you're using Mr. Hanks' information back in
24 '76 and plugging in his parameters to the conventional
25 volumetric calculation, what would be the reserve number

1 you would get using his values for this well?

2 A. In a nutshell 270,000 barrels of oil, which is a
3 very good match with the actual cum of this well.

4 Q. His assumption then is 50 feet of height, 6
5 percent porosity and 160-acre drainage?

6 A. That's correct.

7 Q. And he matches pretty close to the cum of the
8 well?

9 A. That's correct. This was the best available
10 technology he had at the time. He saw limited porosity of
11 6 percent. He was perfing porosity peaks, counting that as
12 pay, so he had a 50-foot drainage thickness. Therefore 160
13 acres would have been appropriate calculation using that
14 technology.

15 Q. You found that's not correct because of the
16 pressure information and because of the infill drilling has
17 produced reserves that well should have produced?

18 A. That's right. That's what we found from this.
19 There was something incorrect in this volumetric equation,
20 and the two parameters that we investigated very carefully
21 were the porosity valuation and the pay thickness.

22 Q. Having made those adjustments, using 12 percent
23 porosity and 75 feet of thickness for this well, what did
24 you calculate to be the approximate drainage area?

25 A. Conservative estimate using our parameters we

1 have available for us with the later technology is 60
2 acres. If you actually back out the cum of that Barbara
3 Federal No. 1, it's calculated somewhat smaller at 52
4 acres. However, we have used 60 acres as a conservative
5 estimate.

6 Q. Is that volumetric calculation based on known
7 data that has been produced from that reserve for the last
8 20 years?

9 A. That's correct.

10 Q. If you can make that adjustment, what are the
11 drainage radiuses?

12 A. This again is just a plot of the drainage
13 radiuses in the Barbara Federal area and the original wells
14 that cumed to 2, 300 MBO.

15 Q. You're looking at Exhibit 14?

16 A. That's correct. And this makes a lot of sense
17 from a drainage point of view. It allows for some minor
18 interference between the original wells, yet the prolific
19 cums which we experienced in the original wells, it allows
20 for performance of the new wells to be as high as the
21 original wells, which is also what we're seeing. This is a
22 visual representation that shows that this makes a lot more
23 engineering sense than what was originally thought to be
24 the case in 1976.

25 Q. Let's leave the Barbara Federal area and direct

1 your attention to one of the other areas. You had that
2 Parish IV area?

3 A. Yes, that was in the center on your location map
4 that we looked at originally. The Parish IV Com 3.

5 Q. Exhibit No. 15 is a portion of the log for that
6 well?

7 A. That's correct.

8 Q. Let's take that as an example then, and have
9 you, first of all, identify Exhibit No. 15?

10 A. This is a porosity log for the Parish IV Com
11 No. 3. In the depth track in the middle of the log are two
12 completion attempts. The first completion that is on the
13 left where you see individual perforations marked, and the
14 second completion is on the right with more of a blanket
15 perforating technique.

16 Q. We're looking at the first completion attempt?

17 A. Yes.

18 Q. The first perforations you've got 34 holes?

19 A. That's correct.

20 Q. Was the completion attempt in a effort to peg
21 perforations on those porosity peaks that they saw on the
22 log that exceeded the 6 percent?

23 A. This particular log was a unique example of a
24 Dagger Draw well. This well, if you look at the porosity
25 scale actually cross-plotted to essentially zero percent

1 porosity throughout the dolomite section. However it had
2 very good structure in Dagger Draw and it also had very
3 good mudlog sheets.

4 Q. I misunderstood. When we look at the porosity
5 values on the log, you wouldn't see within this section any
6 porosity value at 6 percent?

7 A. No, sir.

8 Q. You get zero?

9 A. Essentially the entire dolomite cross-plots to
10 zero.

11 Q. But then the operator goes back and he
12 selectively perforates what?

13 A. Yates didn't have the benefit of an imaging log
14 on this well, and they completed it by shooting the
15 porosity peaks on this well, and treated it with a
16 traditional volume of acid, about 1500 gallons, and on this
17 well it swabbed dry. Subsequently Conoco with its
18 information that they had seen in the Barbara Federal area
19 on imaging logs, we had a strong suspicion that those
20 original porosity tools were missing some of the these bugs
21 that we saw on that imaging log.

22 Therefore, we recommended a substantial increase
23 in perforations, as you can see we recommended 284 holes in
24 several sets of perforations, and a large acid job to try
25 to connect these bugs and secondary porosity features. And

1 the well came in at about 410 barrels a day flowing. It
2 IP'd a couple of weeks later at 259 barrels of oil per day.

3 So this is just a good demonstration that our
4 new understanding of the reservoir is that we have greater
5 pay thicknesses and higher porosity than the original tools
6 indicated when these pool rules were set in 1976.

7 Q. Whether or not it's Yates, or Hanks or Conoco,
8 if you're using the old tool rules, you would end up with
9 what might be a dry hole that in fact is a pretty good
10 producer?

11 A. That's correct.

12 Q. Let's turn to Exhibit 16 and would you identify
13 that one for us.

14 A. There are two examples I have left to speak to,
15 and this is in the Dagger Draw 1 and 9 area. On your
16 original location map it was in the center of the map. The
17 Dagger Draw -- this is an oil production curve for the
18 Dagger Draw No. 1. It spans a period of about 20 years.
19 This is just oil rate per day. This is the oldest producer
20 in the Dagger Draw field.

21 Q. When was it completed?

22 A. In 1971.

23 Q. That's the one with the red arrow on it in the
24 northwest of the northwest of 30?

25 A. Yes, sir.

1 Q. Then the south 40-acre offsets the number 9?

2 A. Yes, sir. That's a new Dagger Draw No. 9 that
3 has just been drilled and completed in November of this
4 year.

5 Q. What was its potential?

6 A. This -- the Dagger Draw No. 9 is -- came on at
7 690 barrels of oil flowing. If I can go back to the 1 for
8 a second.

9 Q. Yes.

10 A. This is the production curve on a well that is
11 producing about 125 barrels a day. I would just like to
12 set you at ease on the shape of this curve. It's more of
13 an incline than decline. That's mostly due to better
14 producing techniques. We've put in a high-volume electric
15 submersible pump in 1983. However, if you see the cums
16 from this well, this well has produced over 300,000 barrels
17 of oil, 3 million barrels of water and over a BCF of gas.
18 If there is any 160-acre proration unit in Dagger Draw that
19 should be drained by now, it's this one, because this is
20 the oldest producing well and it's made a lot of fluid.

21 We drilled essentially on 40-acre spacing
22 another well, the Barbara Federal No. 9, which shares this
23 proration unit and we encountered 690 barrels of oil per
24 day. So just from production history, you can see there is
25 a significant additional reserves on these 160s.

1 The initial pressure on the Dagger Draw No 1 was
2 about 3,000 pounds and we measured about 1900 pounds on
3 this Dagger No. 9. So you would have not expected that
4 type of pressure to be in place if that original well was
5 pressured to depleting a 160-acre proration unit.

6 Also it shows the potential of the additional
7 wells in Dagger Draw. From a drilling potential this
8 Dagger Draw No. 9 requires that we shut in this proration
9 unit always by the mid-month point in the two months it's
10 been producing so far.

11 Q. The new well, the replacement well, has, in your
12 opinion, substantial capacity to continue to produce in
13 excess of the current 350 a day?

14 A. That's correct. I think it has at least for the
15 rest of the year the capacity to produce possibly over 500
16 barrels a day. That combined with the one would put that
17 proration unit very close to 700 barrels a day.

18 Q. In summary, Mr. Findlay, do you see any
19 potential violation or impairment of correlative rights by
20 stepping up the ceiling on the oil allowable to 700 a day?

21 A. No, sir, I don't.

22 Q. Are you going to significantly disrupt drainage
23 patterns that are occurring in the pool by increasing the
24 rate at which these wells can produce?

25 A. No, sir, not in my opinion.

1 Q. Do you see the opportunity for offsetting
2 spacing units to get oil from other interest owners that
3 they would not otherwise be entitled to?

4 A. No, I think we have established that we're
5 seeing drainage radiuses that are much smaller than was
6 originally thought, and that the offset drainage is not a
7 worry given the current pool rules.

8 Q. Would the increase in the oil allowable as
9 proposed allow Conoco and other operators the opportunity
10 to more effectively and efficiently produce the pool?

11 A. Yes, I believe it will.

12 Q. In your opinion will it result in the recovery
13 of more hydrocarbons from the reservoirs than might
14 otherwise be recovered?

15 A. Yes, sir, I do.

16 MR. KELLAHIN: That completes my examination of
17 Mr. Findlay. We would move the introduction of his
18 Exhibits 3 through 16.

19 EXAMINER STOGNER: Are there any objections?

20 MR. CARROLL: None.

21 EXAMINER STOGNER: Exhibits 3 through 16 will be
22 admitted into evidence.

23 (Conoco Exhibits 3 through 16
24 were admitted in evidence.)

25 EXAMINER STOGNER: Let's take a 15-minute recess and

1 come back for cross-examination.

2 MR. CARROLL: I will have no questions, Mr. Examiner.

3 (At 1 p.m. a recess was taken.)

4 EXAMINER STOGNER: This hearing will come to order.

5 Any cross-examination, Mr. Carroll?

6 MR. CARROLL: None, Mr. Examiner.

7 EXAMINER STOGNER: Miss Coogan.

8 MS. COOGAN: No.

9 EXAMINATION

10 BY EXAMINER STOGNER:

11 Q. Mr. Findlay, in looking at Exhibits 3 and 4, how
12 many of -- I'm somewhat confused. Of the wells marked in
13 black, how many of these are P&A'd at this time?

14 A. All of them, sir. The slash indicates the P&A
15 symbol on these particular wells, and these have all been
16 produced to an economic limit.

17 Q. Were they plugged and abandoned about the same
18 time?

19 A. Most of them went through a P&A program in about
20 late '85. They have been shut in at various times, and all
21 P&A'd about late '85. All of them before this new
22 development took place.

23 Q. Are there any plans on maybe reentering some of
24 these old wells?

25 A. No, sir. These old wellbores are

1 five-and-half-inch casing and don't lend themselves very
2 well to submersible pump production. They were used in
3 that area. However, we drilled seven-inch wellbores which
4 lends themselves better to submersible pump production.
5 Also in the original wellbores, those were produced down to
6 economic limits, so I don't see a lot of additional
7 potential in those wells.

8 Q. I was thinking -- you were talking about your
9 perforation scheme today changing from what it was in years
10 previous. Could there possibly be some -- what has Conoco
11 done in that aspect of reviewing these old wellbores?

12 A. The -- we feel that the perforation techniques
13 probably lends itself to a greater benefit on up front
14 initial rates, because it opens access to these additional
15 pay thickness zones that weren't open before. However, on
16 the ultimate cum we don't know how much affect it would
17 have on a wellbore in the long-term.

18 Q. Just some basic background to help me put the
19 picture together.

20 A. Yes, sir.

21 Q. What type of a reservoir are we talking about
22 here? What kind of drive?

23 A. This is a, in our opinion, solution-gas-drive
24 reservoir with a weak water influx; and that is, of course,
25 determined from production history and pressure data.

1 Q. The GOR was raised from 2,000 to 1 to 10,000 to
2 1 in '77? Is that correct, by Order R-5565?

3 A. I know it was raised to 10,000. I'm not sure
4 what the original pressure was, the original GOR was.

5 Q. What I am leading up to, looking at your
6 reservoir data on the wells that were completed prior to
7 '77, did you notice any -- how that order or the raising of
8 the gas/oil ratio had affect on any of these wells?

9 A. No -- to answer your question, no. I can tell
10 you that some of the producing GORs in Dagger Draw are both
11 2,000 on current wells, if that's a help. I've seen them
12 as high as, oh, say 5,000 in North Dagger Draw. I've not
13 seen a 10,000 GOR in our area of operation.

14 Q. You think it prudent to, say, keep the 10,000 to
15 1 at this time?

16 A. Yes, sir, that would certainly lend itself to an
17 extension of these rules in the South Dagger Draw. They do
18 see a little bit higher GOR down there.

19 EXAMINER STOGNER: Are there any other questions of
20 this witness?

21 MR. KELLAHIN: No, sir.

22 EXAMINER STOGNER: You may be excused, Mr. Findlay.

23 MR. KELLAHIN: I call Jim Ballard.

24 JAMES H. BALLARD,
25 the Witness herein, having been first duly sworn, was

1 examined and testified as follows:

2 DIRECT EXAMINATION

3 BY MR. KELLAHIN:

4 Q. Mr. Ballard, for the record would you please
5 state your name and occupation?

6 A. My name is James H. Ballard and I'm a geoscience
7 supervisor with Conoco, Inc.

8 Q. Mr. Ballard, on prior occasions have you
9 testified before the division?

10 A. No, I have not.

11 Q. Summarize your educational background for us?

12 A. I received a master's degree in geology from the
13 University of Montana in 1980 and have since that time been
14 continuously employed by Conoco in a variety of geoscience
15 positions.

16 Q. Summarize for us your experience particularly
17 with the Dagger Draw area, both the north area and the
18 south area?

19 A. Since late 1988 I have been responsible for all
20 of Conoco's geologic work in southeast New Mexico, during
21 which time I've always had a geologist assigned to North
22 Dagger Draw doing continuous evaluation work, and that has
23 included both North and South Dagger Draw.

24 Q. Have you in preparation for this hearing
25 reexamined the geology available to you with regards to the

1 Upper Pennsylvanian formations that are allocated to the
2 North Dagger Draw and the South Dagger Draw pools?

3 A. Yes, sir, I have reviewed all the relevant
4 geology.

5 MR. KELLAHIN: We tender Mr. Ballard as an expert
6 petroleum geologist.

7 EXAMINER STOGNER: Are there any objections?

8 MR. CARROLL: None.

9 EXAMINER STOGNER: Mr. Ballard is so qualified.

10 Q. (By Mr. Kellahin) The request by your company
11 is to increase the oil allowable in the North Dagger Draw,
12 is it not?

13 A. That is correct.

14 Q. From your perspective as a geologist, what do
15 you see geologically that confirms the engineering
16 conclusions that Mr. Findlay was expressing earlier?

17 A. What I would like to present today, fairly
18 briefly and with only two exhibits, is that the fact that
19 the North Dagger Draw pool can be characterized as a Upper
20 Pennsylvanian stratigraphic reservoir which is --

21 Q. You need to speak up just a little bit, Jim.

22 A. I'm sorry. Very similar to many other such
23 pools in southeast New Mexico, which are characteristically
24 developed on less than 160-acre spacing unit, so it is
25 correlative information with that -- which is being

1 presented.

2 Q. Let's go to your structure map and I think we
3 put a display on the wall which might serve your purposes
4 better. Let me have you, Mr. Ballard, go to the structure
5 map that's on wall here and you have to speak loudly so the
6 court reporter can hear you.

7 Without giving us all the wonderful things that
8 you have learned, give us the punch line.

9 A. Certainly. This is a combined structure isopach
10 map of the Cisco C zone, which is what we designate the
11 main production interval of the North Dagger Draw. I have
12 shown for you here the structural contours in blue, the
13 isopach isthmus, that producing part of the reservoir, in
14 red. I've also indicated those wells which produce from
15 the C zone of the Cisco reservoir, and also I have
16 indicated the limits of the North and South Dagger Draw
17 pools.

18 Q. Before we talk about that one any more, identify
19 the cross section.

20 A. As you can see indicated on the structure map I
21 have shown an orange line running through several of the
22 wells of the North Dagger Draw pool. We have there created
23 a cross section which I show here as Exhibit No. 18.

24 Q. Tell us the structural orientation of the
25 reservoir as we move from the north end down to the south

1 towards South Dagger Draw?

2 A. Well, this structure map illustrates, of course,
3 that North Dagger Draw and South Dagger Draw are
4 stratigraphic accumulations. The dip on the formation is
5 really just gently to the east, and what we have is a
6 productive fairway defined by the presence of the dolomite,
7 which is slightly lower to the north and then rises
8 structurally as you go progressively to the south. The
9 area in the extreme north or northwest is, of course, water
10 wet. You proceed through the oil productive zones in North
11 Dagger and South Dagger Draw, then when you reach sub-C
12 elevation at approximately minus 4,000 feet, there is a
13 very broad and somewhat poorly defined gas transition zone,
14 but which cuts through these -- which covers more and more
15 of the pool as we progress to the north -- excuse me -- I
16 mean to the south and get into the Indian Basin which is
17 a -- exclusively a gas-producing area.

18 Q. When you look at the logs for the wells in the
19 North Dagger Draw, can you map the correlative interval of
20 pay from well to well?

21 A. Certainly. This cross section illustrates that.
22 The Cisco C zone is highlighted in blue. This cross
23 section includes several of the productive wells in the
24 North Dagger Draw pool, as well as a couple of the
25 nonproductive on either side. The area highlighted in blue

1 illustrates both the structure and the thickness of the
2 Cisco C zone, which was previously shown on the map. A
3 couple of the wells did not penetrate the entire formation.
4 We have also here illustrated the completion zones in these
5 wells when they were completed in C zone.

6 Q. From a geologic perspective do you see a concern
7 that we need to deal with regards to the water influx into
8 the reservoir?

9 A. Well, not really. As Clyde previously mentioned
10 there is a fair amount of water in the reservoir,
11 throughout the reservoir. In the extreme northern end
12 where the reservoir is exclusively water wet we have not
13 seen that water migrate in a systematic fashion into the
14 producing part of the field.

15 Q. Conversely, do you see the presence of gas wells
16 that may give us a problem for the management of the
17 reservoir if we increase the oil allowables to 700 a day?

18 A. I would say no clearly in the case of the North
19 Dagger Draw, and probably no in the case of South Dagger
20 Draw also. As this map shows and Clyde also mentioned, the
21 larger portion of the southern pool is transitional to the
22 gas portion of the producing reservoir. But I would say
23 clearly no in relationship to the North Dagger Draw pool.

24 Q. From a geologic perspective then can you draw
25 the conclusion and recommendation to the examiner that you

1 see no reason for him not to approve the increased oil
2 allowable?

3 A. I see no reason not to. In fact, the geology of
4 the area illustrates that this producing reservoir is
5 similar to many others in southeast New Mexico. We have a
6 Upper Pennsylvanian stratigraphic reservoir that consists
7 of preferentially dolomitized limestone. It was deposited
8 in the shallow water carbonate buildup, which since has
9 been slightly inclined, but otherwise very similar to many
10 others.

11 The nature of the reservoir, this dolomite
12 reservoir, is indicated on the cross section. Contains
13 fairly low matrix porosities, as Clyde mentioned perhaps up
14 to 6 percent, and also indicates a secondary porosity, a
15 spiking on these porosity logs, which we now know because
16 of the imaging log technology are actually large bugs or
17 secondary porosity; not fractured porosity or some of the
18 other interpretations that can be made of that spiking
19 signature on the porosity logs.

20 This combination of vugular secondary porosity
21 in limited matrix porosities is very similar to the Upper
22 Pennsylvanian reservoirs that we see, and suggests that
23 this pool probably should also be developed as those
24 reservoirs commonly are, on a proration unit significantly
25 less than 160 acres.

1 Q. Are you satisfied as a geologist that
2 Mr. Findlay can use a porosity value in his calculation of
3 12 percent?

4 A. Yes, as an average, I'm satisfied with that
5 value. It's a very heterogeneous reservoir. You have to
6 talk about it, of course, in average values over large
7 areas to perform those reservoir calculations, and I think
8 that's about the best value that can be determined. There
9 will be isolated areas of the reservoir where it is greater
10 and some where it is smaller.

11 MR. KELLAHIN: That concludes my examination of
12 Mr. Ballard. We move the introduction of his Exhibits 17
13 and 18.

14 EXAMINER STOGNER: Are there any objections?

15 MR. CARROLL: None.

16 EXAMINER STOGNER: Exhibits 17 and 18 will be admitted
17 into evidence.

18 (Conoco Exhibits 17 through 18 were
19 admitted in evidence.)

20 EXAMINER STOGNER: Mr. Carroll, your witness.

21 MR. CARROLL: No questions.

22 EXAMINER STOGNER: Miss Coogan.

23 MS. COOGAN: No questions.

24 EXAMINER STOGNER: I have no questions of this
25 witness. He may be excused.

1 MR. KELLAHIN: Mr. Examiner, next witness is Leslie
2 Hall, she is a landman with Conoco. She helped compile the
3 list for the notification and in fact undertook the
4 responsibility for attempting to notify all the appropriate
5 parties in the pool.

6 LESLIE HALL,
7 the Witness herein, having been first duly sworn, was
8 examined and testified as follows:

9 DIRECT EXAMINATION

10 BY MR. KELLAHIN:

11 Q. Miss Hall, for the record, would you please
12 state your name and occupation?

13 A. My name is Leslie Hall. I'm a landman for
14 Conoco, Inc., their Midland division office.

15 Q. On prior occasions have you testified before the
16 division?

17 A. I never have.

18 Q. Summarize for us what you specifically did with
19 regards to this application in terms of forming a reliable
20 basis of information for providing notices?

21 A. I reviewed Conoco's scout books for the area. I
22 used the Midland Map Company ownership map for west Eddy
23 County, and in-house information as far as the proration
24 units that Conoco operates to come up with a list of names
25 of working interest owners and operators to be notified of

1 Conoco's application for this hearing.

2 Q. What is either your educational or employment
3 experience and background as a petroleum landman?

4 A. Well, my educational experience, I have a
5 bachelor's and master's in experimental psychological from
6 SMU.

7 Q. That serves well in this field.

8 A. Serves me very well. And immediately fled the
9 field and had a good opportunity in Wyoming to do some land
10 work on a contract basis, so for the last -- most of the
11 last 10 years I have done contract land work in the Rocky
12 Mountain area.

13 Q. Have you satisfied yourself that you have, to
14 the best of your ability, formulated an accurate and
15 reliable list of the interest owners to provide notice to
16 for this hearing?

17 A. Yes, I have.

18 Q. Let's take a moment and show the examiner what
19 you prepared, directing your attention to Exhibit No. 19.
20 Is this the exhibit to which you refer?

21 A. Yes, sir.

22 Q. This represents your work or at least work that
23 you supervised others to perform for you?

24 A. It does.

25 MR. KELLAHIN: At this time, Mr. Examiner, I tender

1 Miss Hall as an expert petroleum landman.

2 EXAMINER STOGNER: Are there any objections.

3 MR. CARROLL: None.

4 EXAMINER STOGNER: Miss Hall is so qualified.

5 Q. (By Mr. Kellahin) Demonstrate for us what
6 you've done?

7 A. This map shows the boundary of the North Dagger
8 Draw-Upper Penn pool in heavy dotted black line. Within
9 the boundaries you can see the proration units and the
10 color-coding indicates who operates which proration units.
11 Outside of the boundary, you will find the names of the
12 working interest owners of the acreage immediately
13 surrounding the boundary, which information was taken off
14 the Midland Map Company lease ownership map.

15 Q. From this information have you also tabulated a
16 list of the names and addresses of these particular
17 companies or individuals?

18 A. Yes, sir.

19 Q. I'm going to skip Exhibit 20 for a moment, and
20 ask you if the list you compiled is represented on Exhibit
21 21?

22 A. Yes, sir. I might also add that Exhibit 21
23 contains names that were also gleaned from the scout books
24 and from Conoco's in-house information on proration units
25 that we operate.

1 Q. To the best of your ability then have you
2 compiled a list for the North Dagger Draw pool that
3 represents the operators within the pool?

4 A. Yes, sir.

5 Q. If there was a property that did not have an
6 operator, did you attempt to find either the lessee or in
7 the absence of a lessee, the unleased mineral owner?

8 A. That's correct.

9 Q. In addition, have you attempted to tabulate the
10 offsetting operators that are immediately adjacent to the
11 pool within a half-mile radius?

12 A. We have attempted to identify the potential
13 operators and the major working interest owners for the
14 area for a mile surrounding the boundary of the pool.

15 Q. For a mile?

16 A. Yes.

17 Q. With that notice -- that list in hand did you
18 provide notification then to all these parties as best you
19 could?

20 A. That's correct.

21 Q. That's demonstrated on Exhibit No. 22?
22 Exhibit 22 is the return receipt cards.

23 A. That's correct.

24 Q. What is Exhibit No. 20? Let's go back to that.

25 A. 20 is a notification that we sent out to

1 operators and working interest owners to be notifying them
2 of Conoco's application to the NMOCD for this hearing.

3 Q. Exhibit 20 then represents the kind of
4 information you sent to them? This is your effort to tell
5 them what you were doing?

6 A. That's correct.

7 Q. Then finally the package of documents that's
8 labeled Exhibit 23, what does that represent?

9 A. Along with the notification that we sent to
10 operators and working interest owners, we also attached a
11 waiver to objection, and this exhibit includes the waivers
12 that were returned to us.

13 Q. Division rules don't require certified mail
14 notification for purposes of this hearing but you undertook
15 that responsibility?

16 A. That's correct.

17 MR. KELLAHIN: That concludes my examination of
18 Miss Hall. We move the introduction of her Exhibits 19
19 through 23.

20 EXAMINER STOGNER: Are there any objections?

21 MR. CARROLL: None.

22 MS. COOGAN: No.

23 EXAMINER STOGNER: Exhibits 19 through 23 are hereby
24 admitted into evidence

25

1 (Conoco's Exhibits 19 through 23
2 were admitted in evidence.)

3 EXAMINATION

4 BY MR. STOVALL:

5 Q. I notice on your list, front page, third column,
6 fifth one down on the right, the name W. J. LeMay, post
7 office box I recognize. I notice there is a card in here
8 that's been signed by Mr. LeMay. Just for the record we
9 can say that that's probably the same William J. LeMay that
10 sits down the hall and signs these orders; is that correct?

11 A. We believe it is.

12 Q. You indicated that that these would be working
13 interest or operators?

14 A. Outside of the boundaries, what this map
15 reflects is the ownership of the leasehold acreage when it
16 was available taken from the Midland Map Company map. When
17 that was unavailable, what they provide on their map is the
18 owner of the minerals if it's unleased. That's what's
19 reflected outside of the boundaries on this exhibit.

20 Q. For the record, let me state, I don't know where
21 Mr. LeMay's interest is derived, and I know he has just
22 recently divested himself of some.

23 A. I can show you, if you'd like, where it is on
24 the map.

25 Q. I'm not talking so much about who or where.

1 MR. STOVALL: I guess I would ask all counsel at this
2 point if they have any objection to Mr. LeMay signing an
3 order that will come out of this, if they want to waive any
4 objection or what?

5 MR. KELLAHIN: Mr. Examiner, on the record, on behalf
6 of my client we waive any objection or appearance of
7 conflict with Mr. LeMay participating this process.

8 MR. CARROLL: Mr. Examiner, on behalf of Yates
9 Petroleum we would likewise waive any objection to
10 Mr. LeMay signing the order.

11 MS. COOGAN: Mr. Examiner, on behalf of Nearburg
12 Petroleum Company we would waive any objection to Mr. LeMay
13 participating in this order.

14 MR. STOVALL: That is always a problem when you get
15 somebody that's been in the business as the director. I
16 think that's my only question.

17 EXAMINER STOGNER: With that I have no questions.

18 MR. KELLAHIN: That concludes our presentation,
19 Mr. Examiner.

20 MR. STOVALL: Mr. Carroll.

21 MR. CARROLL: I would first call Kathy Porter.

22 KATHY PORTER,
23 the Witness herein, having been first duly sworn, was
24 examined and testified as follows:

25

DIRECT EXAMINATION

1
2 BY MR. CARROLL:

3 Q. Would you please state your name and occupation,
4 by whom you are employed?

5 A. My name is Kathy Porter. I'm employed by Yates
6 Petroleum Corporation as a landman.

7 Q. Miss Porter, you are the same Kathy Porter that
8 testified in an earlier hearing at which time you were
9 accepted as an expert petroleum landman; is that correct?

10 A. That's correct.

11 MR. CARROLL: Mr. Examiner, I would tender Miss Porter
12 again for purposes of this hearing as an expert in the
13 field of petroleum landman.

14 EXAMINER STOGNER: Are there any objections.

15 MR. KELLAHIN: No objection.

16 EXAMINER STOGNER: Miss Porter is still qualified.

17 Q. (By Mr. Carroll) Miss Porter, with respect to
18 our application which we have filed with respect to the
19 South Dagger Draw pool, you have testified at the hearing
20 that was held a couple of months ago in case 10108; is that
21 correct?

22 A. That's correct.

23 Q. Since the time that you testified and today's
24 date, with respect to the ownership map and the diagram
25 depicting the actual configuration of the South Dagger Draw

1 pool, has that in any way changed in the last couple of
2 months?

3 A. The ownership map has not actually changed. The
4 approved pool boundary has changed. In Exhibit 1 that's
5 what we have given you, the red outline does define the
6 exact pool boundaries as set out by the OCD.

7 Q. You're referring to Yates Petroleum Exhibit
8 No. 1 in Case 10222?

9 A. Yes.

10 Q. And when did you last check the OCD records with
11 respect to the present configuration of this pool?

12 A. This current plat was prepared last Friday from
13 the Artesia OCD records.

14 Q. Now, you've had an opportunity to look at
15 Exhibit 1 of -- Conoco's Exhibit 1 in Case 10221; is that
16 correct?

17 A. Yes.

18 Q. There was testimony that the South Dagger Draw
19 is not -- the boundary of South Dagger Draw was
20 approximately a mile to the south. In fact the South
21 Dagger Draw now touches -- because it includes the south
22 half of Section 11 it actually touches the North Dagger
23 Draw boundaries there which -- what I am referring to is
24 the northeast quarter of Section 10 and the northwest
25 quarter of Section 12?

1 A. That's correct.

2 Q. So these two pools are very quickly approaching
3 to having an actual common boundary?

4 A. Yes.

5 Q. On your Exhibit No. 1 that you've prepared for
6 today's hearing, there is also a blue outline. Would you
7 please explain to the examiner what that blue outline
8 depicts and its purpose?

9 A. The blue outline on our Exhibit 1 is the
10 one-mile boundary around the South Dagger Draw pool.

11 Q. What's the significance of that one-mile
12 boundary?

13 A. This is simply to show that this is where we
14 obtained our information to notify all operators and
15 unleased mineral owners within this one-mile boundary.

16 Q. With respect to the hearing that we had earlier,
17 10108, was there any change -- while the boundaries have
18 grown slightly since -- in the last couple of months, was
19 there any change in the persons to whom notice had to be
20 given?

21 A. Not to my knowledge, no, sir.

22 Q. In fact -- and I will show you will what we have
23 marked as Exhibit 2 -- this is an affidavit that is
24 presently on file in case 10222, which is a certificate
25 that we have mailed notice, return receipt notice, to those

1 persons concerning today's hearing?

2 A. Right.

3 Q. I guess the last question I would ask with
4 respect to any of the testimony that you gave in the
5 earlier case, because we have asked that it also be
6 considered in this case, are you aware of any corrections
7 that need to be or problems that you have become aware of
8 since you gave that testimony?

9 A. No, sir.

10 Q. You would adopt any -- the statements you made
11 in the earlier hearing today?

12 A. What I said previously, that is correct.

13 MR. CARROLL: I would pass the witness, Mr. Examiner.

14 EXAMINER STOGNER: Mr. Kellahin?

15 MR. KELLAHIN: No questions.

16 EXAMINER STOGNER: Miss Coogan.

17 MS. COOGAN: No questions.

18 EXAMINER STOGNER: No questions either at this point.

19 MR. CARROLL: We next call Dave Boneau.

20 DAVID FRANCIS BONEAU,

21 the Witness herein, having been first duly sworn, was
22 examined and testified as follows:

23 DIRECT EXAMINATION

24 BY MR. CARROLL:

25 Q. Would you please state your name, your

1 occupation and by whom you are employed?

2 A. My name is David Francis Boneau. I work as a
3 reservoir engineering supervisor for Yates Petroleum in
4 Artesia, New Mexico.

5 Q. Mr. Boneau, you have previously testified a
6 number of times before the OCD and had your credentials as
7 a reservoir engineer accepted, have you not?

8 A. Yes, sir.

9 MR. CARROLL: Mr. Examiner, I would again tender
10 Mr. Boneau as an expert in the field of reservoir
11 engineering.

12 EXAMINER STOGNER: Are there any objections?

13 MR. KELLAHIN: No, objection.

14 EXAMINER STOGNER: We recognize Mr. Boneau as an
15 expert witness.

16 Q. (By Mr. Carroll) Mr. Boneau, would you state
17 briefly, so that we might expedite this matter, the basis
18 of Yates's position with respect to its application that is
19 now pending before of the OCD?

20 A. Yates is here asking for two things. Yates
21 believes that the South Dagger Draw pool should have the
22 same allowable on an acreage basis as the North Dagger Draw
23 Upper-Penn pool. Thus we are asking for an oil allowable
24 of 1400 barrels of oil per day for the 320-acre spacing
25 unit in the South Dagger Draw pool.

1 Our second purpose is to suggest that the NMOCD
2 restrict well density in both the North and South Dagger
3 Draw pools to a maximum of two active wells per
4 governmental quarter section on a temporary basis for two
5 years. The practical affect of this suggestion is to space
6 the whole of the Dagger Draw pool on 80 acres for an
7 interim period until reservoir performance tells us whether
8 further downspacing to 40 acres is required.

9 So those are the two things we're looking for;
10 we're looking for equal treatment on allowable in South
11 Dagger Draw, and then we have this suggestion of doing it
12 in an orderly way to go to 80 acres and possibly later go
13 to 40 acres.

14 I think you have heard evidence on South Dagger
15 Draw being the same reservoir as North Dagger Draw. I
16 doubt if there is much reason to say much about that. I
17 hope not. The order in Case 10108 concluded that the pools
18 were a common source of supply. The geology testimony you
19 heard is its a common source of supply. Yates testified to
20 that in the earlier hearing. It's still true. We think
21 Conoco did an excellent job of supporting a 700-barrel a
22 day allowable in the North and the equal condition on an
23 acreage basis is 1400 barrels of oil a day in the South.
24 Double the allowables in both places if you're going to do
25 this, and we think both of them are good ideas.

1 I'd like to spend a minute or two or three
2 giving my reasons for suggesting this temporary limit of
3 two wells per government quarter section. Again,
4 essentially two reasons: The first is simply that is the
5 next logical step, de facto spacing has been 160 acres,
6 let's go to 80 acres, see how that works, if we need
7 smaller spacing we will all be happy to come back and see
8 you again. The second reason for that suggestion relates
9 to the water disposal and the gas treating facilities that
10 are required at Dagger Draw. Yates production at Dagger
11 Draw is now about 7500 barrels of oil a day, about 40
12 million cubic feet of gas per day, and about 35000 barrels
13 of water a day. We have eight saltwater disposal wells to
14 handle this produced water. Our gas now goes two places;
15 some of it goes to a Transwestern sweetening plant near the
16 field, handle about 10 million a day, and some of the gas
17 goes to the Northern Natural plant 90 miles away in Hobbs.

18 Yates has a permit for a 20-million-a-day plant
19 that will be constructed this spring near the field, and we
20 have applied for a permit to raise the capacity of this new
21 plant to 40 million cubic field per day. Our concern is
22 that in the absence of a well density limit, a drilling
23 race may develop which will waste money, overdrill the pool
24 and cause the construction of unnecessary gas and water
25 handling facilities. And my one exhibit is aimed at

1 illustrating that point.

2 Q. You are referring to Exhibit No. 3 which is
3 composed of two pages, are you not, Mr. Boneau?

4 A. Yes, sir, that's correct.

5 Q. If you would explain to the examiner just
6 exactly what this exhibit is, and then your conclusions
7 based on it.

8 A. The Exhibit No. 3 summarizes Yates's development
9 plans for Dagger Draw. Page 1 is a graph of oil and gas
10 production forecasts, while page 2 outlines the development
11 plan and highlights the facility problem I hope. Yates as
12 of 1-1-91, the first of the year, had 57 wells producing in
13 the Dagger Draw field. We have 67 more wells to drill to
14 complete the development on 80 acres.

15 The first page of Exhibit 3 shows in solid lines
16 what the production of oil and gas will be under what I'm
17 calling an ordinary development program. The maximum oil
18 rates at the bottom of the graph would be about 10,000
19 barrels a day and can be maintained roughly flat up until
20 1998, if we go about an ordinary development. That's
21 10,000 barrels of oil a day, would be accompanied by 70
22 million cubic feet of sour gas. And that sour gas line is
23 in the middle of page 1. The solid line that oscillates
24 along about 70 million a day up to 1998. The water
25 production is not shown on this graph, so it's not more

1 busy than it is. But our water production would be about
2 60,000 barrels of water a day.

3 If a drilling race develops, Yates will be
4 forced to drill more wells in the next three years, and
5 there will be more sour gas to handle. And those are what
6 are illustrated with the dashed lines on the first page.
7 If we drill our 80-acre wells and our 40-acre wells in the
8 next two or three years, production will spike up; gas
9 production to 110 million a day on the Yates acreage, and
10 then fall rapidly after two or three years. Yates would
11 have to build another large gas plant if we could get the
12 permits, and we would also have to develop probably five
13 extra saltwater disposal wells. These additional
14 facilities would only be used for two or three years when
15 the field is at peak production.

16 The wiser course is orderly development so that
17 fewer gas wells, gas facilities, and water facilities must
18 be built, and the ones that are built can be used to full
19 capacity for a longer length of time, 8 or 10 years. I
20 think that's basically the argument. We're drilling a lot
21 of wells out there to try to get production up for
22 ourselves and for New Mexico and Bill LeMay. Whether or
23 not he has an interest. But it seems foolish to me to let
24 production spike go to a unsustainable level and then fall
25 rapidly. Yates want's the allowables doubled in both the

1 north and the south, and our suggestion is that we think it
2 would be wise to downspace one step at a time. Basically
3 that's our case. Those are our two points.

4 Q. Mr. Boneau, in the previous case of 10108,
5 Mr. Benson McGorter, an engineer for Yates testified.
6 Mr. McGorter does work under your supervision and control,
7 does he?

8 A. Yes, sir, that's correct.

9 Q. You are aware of the testimony that was
10 presented at this earlier hearing. Has anything in the
11 intervening time period -- has anything come to your
12 attention which would contradict or make incorrect any of
13 the evidence that was presented at that earlier hearing?

14 A. No, there is no contradiction. On the other
15 hand, there has been additional drilling which confirms
16 those conclusions.

17 Q. I believe you testified that with respect to the
18 geological and engineering testimony that was presented by
19 Conoco today that Yates is in complete agreement. When I
20 say "complete," at least in agreement. There is no such
21 thing as complete. I would be afraid to use that word. In
22 agreement with the position that Conoco has presented?

23 A. No. Conoco presented a very complete and
24 detailed, beautiful case of downspacing is needed.

25 Q. That is Yates's position?

1 A. Yes, sir.

2 Q. Just that the only thing that they would add is
3 that you'd like to see it for both South and North Dagger
4 Draw?

5 A. We would like to see it for South and North
6 Dagger Draw, yes, sir.

7 Q. Mr. Boneau, is it, in your expert opinion, that
8 the granting of both of these applications, which have been
9 consolidated for this particular hearing, that the granting
10 of both would protect correlative rights and prevent waste
11 for owners of interest out in this particular area?

12 A. Yes, sir.

13 Q. And just to touch on the comment that you made
14 about increasing production. It has in the recent past
15 months become at least an espoused position of the OCD
16 through requests to producers within the state to come
17 forward with ideas which would maximize production within
18 the state. Is that what you were referring to and
19 Mr. LeMay's earlier letter, and is this in fact one of the
20 ways that Yates would propose to the commission to fulfill
21 that espoused need?

22 A. Yes, sir, that's correct, and I think it's clear
23 that Conoco is trying to do that same thing.

24 MR. CARROLL: Mr. Examiner, I would have no further
25 questions of Mr. Boneau. I would move admission of the

1 Exhibits 1, 2, 3 which we presented today.

2 EXAMINER STOGNER: Are there any objections?

3 MR. KELLAHIN: No objection

4 MS. COOGAN: No.

5 MR. STOVALL: Exhibits 1, 2, and 3 will be admitted
6 into evidence at this time.

7 (Yates Exhibits 1 through 3 were
8 admitted in evidence.)

9 EXAMINER STOGNER: Thank you, Mr. Carroll.

10 Mr. Kellahin, your witness

11 MR. KELLAHIN: Thank you, Mr. Stogner.

12 CROSS-EXAMINATION

13 BY MR. KELLAHIN:

14 Q. Mr. Boneau, let me make sure I understand the
15 position you are representing with your company. If the
16 examiner does not limit well density to 80 acres, would you
17 withdraw your support for the increased oil allowable to
18 the 700 barrels on the 160 or the corresponding 1400 today
19 on the 320?

20 A. No, sir, that is not our position. Our position
21 is that we fully support 700 barrels of oil a day allowable
22 in the North and the same similar doubling of the allowable
23 in the South. The second point was an add-on suggestion,
24 argument, evidence, whatever you want to call it, that in
25 doing that we think it would be wiser to include a

1 stipulation of two wells per quarter section.

2 Q. I had recognized it as a suggestion. I think
3 you reconfirmed it was a suggestion on the well density?

4 A. That's the word I'm using. I can't go up there
5 and beat him over the head with a club. I can suggest to
6 him.

7 Q. I did not see that restriction or limitation set
8 forth in either your application or in the docket for
9 hearing today, nor do I see it proposed as a specific rule
10 by you. I was trying to understand as to what degree of
11 conviction are you espousing this suggestion?

12 A. I think you really don't want me to answer that.

13 Q. I want you to explain -- you're worried about
14 the competitive drilling down to 40 acres. In looking at
15 the maps you have provided, and the ones that Miss Hall
16 provided, it appears to me that well density for a
17 significant portion of Yates acreage in both pools is
18 within your control and discretion, regardless of what the
19 rule is? Is that not a fair characterization?

20 A. I think what you're saying there are -- there
21 are parts of the reservoir where Yates's wells are offset
22 by Yates's wells.

23 Q. Yes, sir. Identify for me those areas of
24 specific concern for which you believe there will be
25 introduced competitive 40-acre density by another operator

1 for which you are going to have to respond? Can you do
2 that?

3 A. Surely. They are the areas operated -- they're
4 the areas offsetting the wells operated by people other
5 than Yates. You're welcome to count up how many you think
6 that is.

7 Q. Have you -- you counted and assessed the
8 potential if well density goes to 40 acres of how many
9 actual spacing units you're going to be exposed to that
10 risk?

11 A. Spacing units would be in the 5 to 8 range, and
12 the wells would be in 12 to 20 range. Something on that
13 order.

14 Q. Is that true of both pools, your acreage
15 position in both pools?

16 A. Yes. This is one field. My numbers refer to it
17 as one field.

18 Q. I was making sure that you and I are working on
19 the same definition.

20 A. Yes, I may be careless about that sometimes, but
21 Dagger Draw --

22 Q. Is both North and South?

23 A. -- both North and South, yes, sir.

24 Q. You said you -- you agreed with and supported
25 Mr. Findlay's engineering conclusions that justified

1 increasing the oil allowable to 700 a day on 160s. I
2 assume you still have that position?

3 A. Certainly.

4 Q. Did you study his Exhibit No. 3 here and his
5 engineering display when he talked about the Barbara
6 Federal area? Did you see the well density in that area?

7 A. Yes, sir.

8 Q. That's on de facto 40-acre spacing now, is it
9 not?

10 A. I would not say yes to that. I surely admit
11 that there are 40-acre offset wells a number of places in
12 the field.

13 Q. Do you have any disagreement with Mr. Findlay's
14 selection of a 12 percent porosity value to use in his
15 volumetric calculation?

16 A. I have not examined the logs on the Barbara
17 Federal that he referred to with those. I did do
18 volumetric calculations in the Barbara Federal area when
19 Yates got into this field in a big way in 1986, and I came
20 with a drainage areas of 80 acres roughly, which I consider
21 fairly close to his 60 number, so I see agreement there. I
22 see that as the best way to answer your question. I'm not
23 going to . . .

24 Q. But we do, in fact, -- you can find areas in
25 which well density has gone to 40 acres, can we not?

1 A. You can find areas where there are four wells in
2 a square on 40 acres, but there are undrilled locations
3 hanging out from the sides of those wells; they're really
4 on 80s. It's just the people have chosen to put the wells
5 on 80s next to each other.

6 Q. Explain to me your Exhibit No. 3. When I look
7 at the graph here -- and each of these dots when we get
8 to -- from '86 through '89, those represent --

9 A. Those represent actual production values for
10 those months of oil and gas from Yates-operated wells.
11 Everything I said was about Yates-operated wells.

12 Q. By looking at Yates-operated wells in the North
13 and South Dagger Draw -- and I'm looking -- this is done on
14 a monthly basis in each year?

15 A. Yes.

16 Q. That is your cumulative production in barrels of
17 oil for your properties and displayed in a monthly total
18 and you have plotted that.

19 A. I plotted those valuations or barrels of oil per
20 day during each individual month or MCF of gas during each
21 individual month.

22 Q. And that follows true until we -- we end in
23 1990, so all the dots represent known values to us?

24 A. Yes, sir.

25 Q. What's the difference between the Xs and the

1 dots?

2 A. The dots are gas and the Xs are oil.

3 Q. What gives you the basis of forecasting then the
4 shape and the slope of the dashed curve and the solid curve
5 when we go into forecasting the future performance?

6 A. Those scenarios are detailed on the second page.

7 Q. Okay.

8 A. The top half of the second page, which is right
9 above the words, "delay 40-acre spacing," outlines a
10 scenario that is shown in the solid line, delay 40-acre
11 spacing on page 1. You move across the top of the page it
12 shows the production of the 57 wells that Yates had, it
13 started this year, and how they will decline to get the
14 reserves that we believe that they have.

15 The second group says "1991 drilling," assumes
16 30 wells. Yates will drill 30 wells in 1991 in our 80-acre
17 develop program. And it shows year by year the expected
18 production from those 30 wells and their decline.

19 The next group shows 1992 drilling of 30 wells,
20 and 1993 drilling of seven wells to complete the 67 wells
21 that are required for Yates to develop its acreage on
22 80-acre spacings with some areas out to the west being on
23 160 at the end this program.

24 Q. What is your control or what is your proof that
25 tells you that delay in 40-acre spacing will put -- I guess

1 I'm confused by the display. Why will the solid line
2 exceed the dashed line when we get into the 1989 and beyond
3 time? What's the explanation?

4 A. '97 and '98, you talking about those years?

5 Q. No, sir, from '98, '99, why is the solid line --

6 A. The solid line scenario, which is the top of
7 page 2, has the 40-acre drilling starting in 1994 and
8 continuing to 1998. And so the production from those
9 wells, assuming they are needed, comes in the last half of
10 the 1990 decade.

11 Q. It is a time shift in the recovery of the
12 reserves, and it has nothing to do with the increase or
13 decrease of ultimate recovery?

14 A. No. All of the recovery of the two scenarios is
15 exactly the same.

16 Q. And part of the shift then is based upon the
17 capacity of your system, either the gas plant or your
18 saltwater disposal wells, to handle the increased volumes?

19 A. That's correct. If you spread the drilling out,
20 you can use a smaller plant for a longer period of time.
21 If you accelerate all the drilling to a short time period,
22 your production spikes up and comes down, and you've got
23 bigger facilities which are only useful for a shorter
24 period of time.

25 MR. KELLAHIN: I understand your position. Thank you,

1 sir. No further questions.

2 EXAMINER STOGNER: Thank you, Mr. Kellahin. Is there
3 any redirect?

4 MR. CARROLL: None.

5 EXAMINER STOGNER: Miss Coogan?

6 MS. COOGAN: No questions.

7 EXAMINER STOGNER: I have no questions of Dr. Boneau.
8 He may be excused.

9 MR. CARROLL: Mr. Examiner, that would conclude our
10 case.

11 MR. KELLAHIN: We need some guidance, Mr. Examiner, on
12 how you want to handle the well limitation issue. Conoco
13 thinks it's a unnecessary restriction at this point.

14 MR. STOVALL: Mr. Kellahin, I think I can jump right
15 in and cut you off, and say it's not part of the
16 application.

17 MR. KELLAHIN: That's -- my thought is that rather
18 than call Mr. Findlay back to rebut this issue, we would
19 suggest that if it's to be a topic, it should be a separate
20 topic at another hearing called for that purpose and would
21 take the position that the examiner should deal with the
22 oil allowable case, because that's what was docketed. And
23 therefore I will not rebut Dr. Boneau's position on that
24 question. So we're ready to close this in my opinion.

25 EXAMINER STOGNER: So at this point we're ready for

1 closing arguments, comments or closing statements I should
2 say. Miss Coogan, I will allow you to go first.

3 MS. COOGAN: I have none. Thank you.

4 EXAMINER STOGNER: Mr. Carroll.

5 MR. CARROLL: Mr. Stogner, I don't think it's
6 necessary to -- for me to beat a dead horse. I think the
7 facts have been very adequately presented by the witnesses,
8 and I think the commission understands what the rules and
9 regulations are. With respect to this issue of
10 Mr. Boneau's suggestion, it was something that was
11 discovered after the application was filed. I think
12 through discussions between Conoco and Yates, it was felt
13 that it was an issue that at least needed to be -- we did
14 not want to delay the hearings any further, and I think
15 everybody wanted that. It was something we did not want
16 left unsaid and the issue needed to be at least addressed.
17 We do recognize it can be the subject of further hearings
18 at any time that Yates or Conoco feels motivated to make
19 application therefore. But we did not want to have this
20 hearing closed without some mention of that -- of the very
21 real problem which Yates Petroleum considers is not only
22 valid but deserves some merit consideration. That's all I
23 have to say.

24 EXAMINER STOGNER: Thank you, Mr. Carroll. Mr.
25 Kellahin.

1 MR. KELLAHIN: In summary, Mr. Examiner, I think both
2 Yates and Conoco have in a very convincing, persuasive way
3 accomplished what Commissioner LeMay asked us to do last
4 October, is to help him find areas where the state of New
5 Mexico and all interest owners could increase oil
6 production for the state of New Mexico. And for everyone
7 involved this represents an extensive effort by both
8 companies with widely known information disseminated to all
9 possible parties to find unique, innovative ways to
10 increase oil production. We have demonstrated we can do so
11 without waste, without violating correlative rights, and we
12 want the opportunity to have the increased oil allowable
13 and let us go about producing more oil in the reservoir.

14 EXAMINER STOGNER: Does anybody else have anything
15 further out of these cases? Case Nos. 10221 and 10222 will
16 be taken under advisement at this time.

17 (The foregoing hearing was concluded at the
18 approximate hour of 2:15 p.m.)

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1 STATE OF NEW MEXICO)
) ss.
2 COUNTY OF SANTA FE)


3 REPORTER'S CERTIFICATE

4
5 I, Susan G. Ptacek, a Certified Court Reporter and
6 Notary Public, do HEREBY CERTIFY that I stenographically
7 reported the proceedings before the Oil Conservation
8 Division, and that the foregoing is a true, complete and
9 accurate transcript of the proceedings of said hearing as
10 appears from my stenographic notes so taken and transcribed
11 under my personal supervision.

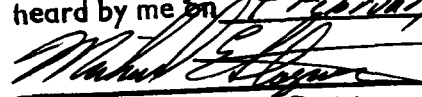
12 I FURTHER CERTIFY that I am not related to nor
13 employed by any of the parties hereto, and have no interest
14 in the outcome thereof.

15 DATED at Santa Fe, New Mexico, this 11th day of March,
16 1991.

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SUSAN G. PTACEK
Certified Court Reporter
Notary Public

My Commission Expires:
December 10, 1993

I do hereby certify that the foregoing is
a complete record of the proceedings in
the Examiner hearing of Case Nos. 10226 and 10222
heard by me on 17 February 1991.
, Examiner
Oil Conservation Division