BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
CONFERENCE ROOM, STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO

August 22, 1973

EXAMINER HEARING

IN THE MATTER OF:	
Application of Roger C. Hanks for creation of a pool and special rules therefor, Eddy County, New Mexico.	Case No. 5048

BEFORE: Richard L. Stamets,
Examiner.

TRANSCRIPT OF HEARING

MR. STAMETS: Case 5048.

MR. CARR: Case 5048: Application of Roger C. Hanks for creation of a pool and special rules therefor, Eddy County, New Mexico.

MR. CHRISTY: James Christy, appearing on behalf of the Applicant. We have two witnesses to be sworn, Mr. Examiner.

MR. STAMETS: Are there other appearances in this case?

(No response)

* * * *

LARRY McINTOSH,

was called as a witness, and after being duly sworn according to law, testified as follows:

DIRECT EXAMINATION

BY MR. CHRISTY:

Q Would you please state your name, address, and your occupation?

A Larry McIntosh, I reside in Midland, Texas, and I am a consulting petroleum engineer.

Q Mr. McIntosh, have you previously testified before this regulatory body and had your qualifications as a petroleum engineer accepted?

A Yes.

Q Are you familiar with what is sought in Case 5048?

A Yes, I am.
Q Will you briefly turn to Exhibit One and tell me what it is? I believe it is the area involved, and the parameters around it, is it not?
A That's right. It is a lease plat showing the proposed field area, and also showing the other wells within the general area which have penetrated the Cisco-Canyon portion of the Upper Pennsylvanian formation. The area to be considered in this hearing is outlined in yellow. The wells which are enclosed in circles and colored red are wells which have been completed in the Cisco-Canyon-- Gas wells which have at one time or another been processed from the Cisco-Canyon. Those with squares within squares and colored green are wells that have penetrated the Cisco-Canyon, but that were unsuccessful in their completion attempts.
Q I believe we have blown up Exhibit One to a larger size map, and this map represents Exhibit One, and contains the same information as Exhibit One, is that right?
A Yes.
Q Tell us what is sought by this application.
A Roger C. Hanks is seeking the designation of a new pool area here, and is seeking new rules governing production in this area, which is made up of Sections 23, 26, and 35 of Township 20 South, Range 24 East in Eddy County,

New Mexico.

Q Do you have any other comments on Exhibit One that would be of interest to the Examiner?

A Yes, I think so. The proposed area is part of a larger area which has a number of Cisco-Canyon fields within it. The wells on the south part of the map, south of the proposed area, are part of the Indian Basin Upper Pennsylvanian field.

This is a large and rather prolific gas field. To the north, there are a number of smaller Cisco-Canyon fields. There is the South Dagger Draw field to the north, which has two producing oil wells and one well which has been re-completed in another zone.

North of that, there is the Parrish Ranch field, which also has two producing oil wells and an oil well which has been abandoned.

Q Which one has been abandoned?

A The one in the Northeast of the Northeast of Section 24. Continuing on up into the upper right portion of the map, we have the Boyd Cisco gas field, which contains one well, which is offset by a couple of wells that have undesignated classifications.

Over in this upper left portion, there is the Antelope Spring field, which is a single Cisco gas field.

Q Going back to the South Dagger Draw area, you mentioned

there were two, and I see a third one located in the Northwest of the Northwest of Section 1. Has that not been abandoned?

A Yes, that's true.

Q That is true?

A Yes, sir.

Q All right, sir, now continue please. Is there anything else in Exhibit One?

A I believe that covers it.

Q Now, the area involved in this application, I believe, has four wells in it, is that correct?

A Yes, that's true. The field was discovered in January of 1971 when Roger Hanks completed the Preston Federal No. 1. This is the well in Section 35. It was completed as a gas well with an initial openflow slightly in excess of 1,000,000 cubic feet a day. The well also flowed water at a rate of about forty to fifty barrels an hour.

In May of 1971, there were two additional wells completed, both oil completions, the Hanks Robin Federal No. 1 in Section 26, and the Hanks Penney Federal which is in Section 23.

The Robin No. 1 had a flowing potential of 204 barrels daily, while the Penney Federal has a flowing potential of 144 barrels daily.

Both of these wells, incidentally, had low initial gas-oil ratios.

The fourth well was the Vickie Federal, which is in the Northeast of Section 26. This well was completed in September of 1971, and it was completed on pump pumping for 303 barrels of oil daily and 728 barrels of water. This well had an initial gas-oil ratio of 2,640.

The Preston and Penney were shut in after they were completed, due to an absence of a gas connection in the area and an absence of salt water disposal facilities. The Robin and the Vickie Federal No. 1 did produce for a few months, they produced until December of 1971. At this time, they too were shut in.

The four wells remained shut in until the latter part of March, 1973, at which time they were returned to production.

Q Do you have a cross section of logs on those four wells?

A Yes, I do, and this is Exhibit Number Two.

Q Let's identify how your A A Prime goes,first of all.

A Beginning on the left is the log on the Preston Federal No. 1. We then go to the Robin Federal No. 1, east to the Vickie Federal No. 1, and back to the northeast to the Penney Federal No. 1. This cross section shows the producing zones in the four wells in the proposed

field. The Cisco-Canyon here is composed of a carbonate reef and reservoir rock described as limestone with varying degrees of dolomit. The porous sections are found to occur primarily in those zones which are predominantly dolomite.

I think we can see from the logs here that there are numerous porosities within the overall reef section. Cores that have been taken on the wells here indicate there are some vertical fractures present, however core analyses and drill stem test data would indicate that there is not vertical communication entirely through the entire reef section.

The wells by their flow characteristics have exhibited good permeability, and we have some evidence of communication between some of the wells. However there is the possibility that every porosity zone does not extend from well to well through this area.

Q And your porosity zones are shown in red on Exhibit Two?

A Yes. This is just an arbitrary designation which I have shown here.

Q Which lead into the next series of exhibits, where you will mention a little bit about the pressures?

A Yes. On the cross section by each of these wells, I have shown initial pressure taken on these wells. Opposite the intervals that were tested, I have the

pressure shown.

On the Preston Federal No. 1 on the left of the cross section is the bottomhole pressure taken from build-up after the well had been perforated and had been flowing and had been tested for about nineteen hours. The other pressures that I show here on the other three wells were all taken from the drill stem tests. Each of these wells indicate pressure in a range of 2900 PSI, and this is the normal virgin pressure for this formation and this depth in this area. This is indication that these wells, at least for the zones that were tested, had not suffered any pressure depletion as a result of any production from any of the other Cisco-Canyon fields in the area.

Q You mentioned that some of these wells have been taken off and put back on, and then taken off production. Would you refer to Exhibits Three, Four, Five and Six at this point?

A Yes. These wells were returned to production in the latter part of March of 1973. I have Exhibits Three, Four, Five and Six which show daily production. These figures were taken on the wells from the early part of April through the early part of August. These show daily water, gas, and oil production from each of the wells.

We might look at each one of these individually here.

The Preston Federal No. 1, which is Exhibit Number Three, during the early part of August was producing at a rate of about 240 MCF per day. There was no oil recovery being reported on the well. The well is making about 900 barrels of water daily. I might mention that this well, in fact, all of the wells, when they were returned to production in March were on hydraulic pump. However this well and the Robin Federal and the Preston Federal did begin flowing after they had been producing for a while.

Q Which wells?

A The Robin, the Preston, and the Penney.

Q Thank you.

A Going to Exhibit Four, this is a production graph on the Penney Federal No. 1. This well has produced at a rate of about one-half million cubic feet daily for the early part of August. The gas-oil ratio on this well was approximately 73,000 to one.

Going to Exhibit Five, which again is a production graph on a well, this one being the Robin Federal No. 1. For the early part of August, this well was producing at a rate of about 1225 MCF per day, about one and a quarter million cubic feet daily. The gas-

oil ratio on this well was approximately 100,000 to one.

Exhibit Six is our last production graph, and it is on the Vickie Federal Number 1. This well still is on hydraulic pump. This well produced gas at a rate of 330 MCF per day, and for August, the gas-oil ratio was about 41,000 to one.

Each of these wells, of course, is still producing a rather large quantity of water at this time.

Q You mentioned earlier something about pressure, and I would like to go into some more detail on the pressures, and I refer you to Exhibits Seven and Eight at this point.

A Exhibits Seven and Eight are related. Exhibit Seven is a tabulation of bottomhole pressure taken on the four wells that are being considered, plus the average pressure that has been reported for the Indian Basin Upper Pennsylvanian field.

These wells are listed chronologically on the tabulation here. The same information is shown in graphical form on Exhibit Eight. I think the particular significance on this exhibit, if you will look at Exhibit Eight in the graphical form, there are pressures that were taken in 1971, and the pressures that are shown there from January through August, 1971 were initial pressures that were taken.

These were the ones that were on the cross section on Exhibit Two. I might add that all of these pressures on these four wells have been corrected to minus 3640. On this one done for comparison purposes, you see there the initial pressures taken on the wells being approximately 2900, which is also the initial pressure for the Indian Basin field.

The Indian Basin average pressure is connected by the dashed line, and I know that the average pressure in the Indian Basin at that time was about 2450 PSI.

Also of particular significance on this exhibit are the two pressures taken on the Preston Federal No. 1 Well in December, 1971. These two pressures are enclosed in triangles on the graph. The first pressure was taken on December 13th, 1971, and this is lower pressure, it showed a pressure of 2438 PSI. This was more than 500 pounds lower than the initial pressure on this well, although the well had been shut in since its initial completion. However, the two wells to the north of the Preston, the Vickie and the Robin, were producing during this time. These two wells were shut in on the following day, December 14th, and another pressure was taken three days later, on December 17th. This is the higher pressure indicated here, the 2738 PSI, or 300 pound increase.

Q You are speaking of a 300 pound increase in the Preston well?

A Yes.

MR. STAMETS: I would like to point out one thing. It appears to the Examiner that your pressure initially on that well was still above the average, the Indian Basin average. Then when you shut the other two wells in, it increased substantially above the Indian Basin average.

A Yes, this is true. This is an indication to me that the Preston Federal was in communication with one or both of the producing intervals open in the two producing wells.

Q Does there appear to be communication among the four wells that produce in this pool?

A There is pressure information that we have here indicating to me communication, at least between those three, or at least two of the three wells there. You do not have positive indication by means of pressure information that the Penney Federal is in communication.

Q Now, I think we have prepared proposed rules for this pool, that is, the South Dagger Draw-Upper Pennsylvanian Pool. First, let's go over the rules in Exhibit Nine, and highlight the special rules. What is the standard unit comprised of?

A We propose a standard unit of 320 acres.

Q That would be the North half of the South half and the East half of the governmental section?
A Yes, that's true.
Q I think you also propose a method of non-standard or unorthodox locations in conformity with the prior history of the Oil Conservation Commission and the manner in which they did have administrative hearings on certain-- when certain factors were found, and with the absence of any objections?
A Yes.
Q Then your next rule, I believe, is a standard rule with respect to locations being 660 feet from either sideline and 1980 feet from the end line boundary, which is a rather standard OCC rule, is that correct?
A Correct.
Q And the exception to that is when you have various factors such as when topographical matters occur.
A Yes.
Q Now, would you tell me what you would classify as a gas well, and what you would classify as an oil well, and I refer to Rule 6?
A Yes. The performances on these wells, especially the initial performances of some of the wells, has indicated we do have both gas and oil producers here. Three of the wells initially produced at a fairly

low gas-oil ratio. We propose a gas-liquid ratio of 30,000 to one, and this would be a critical point in deciding whether the well is designated as a gas or oil well.

Q What is the limiting gas-oil ratio to be?

A Eight thousand cubic feet of gas for each barrel of oil produced.

Q How did you arrive at that number?

A This ratio is four times the normal ratio of an oil well, which is 2,000 to one. While we are proposing 320-acre spacing for the field, we are only proposing an oil allowable of 267 barrels daily. This is the depth allowable for 80-acre spacing, so in essence, what we are doing by limiting the gas-oil ratio is proposing a maximum gas withdrawal on a per acre basis, and it would be the same as it would be for normal 80-acre spacing, or oil wells on 80 acres.

Q I believe the attached rules, Rule 10 to the end of the rules, were to comply with rather standard provisions of the Oil Conservation Commission and other pool rules, but I particularly want to mention two of them which I believe should be corrected on the exhibit, or amended.

Let me first go to Rule 17. I believe you called my attention to it this morning, to a typographical

error in Rule 17?

A Yes. It refers to a 40-acre tract allowable, and this should have been an 80-acre tract allowable.

Q And secondly I would like you to refer to the balancing period in Rule 18, which refers to the date of January 1st. Recently I believe the Commission amended this normal balancing period to April 1st. Would that be your suggestion in these rules?

A Yes, we would want to comply with normal procedure there.

Q Now, do you have an opinion as to whether or not the granting of this application in Case 5048 would tend to protect-- avoid waste and protect correlative rights of interested parties and provide for effective production of recoverable hydrocarbons from the proposed area?

A Yes, and I would recommend that the proposed rules be adopted.

Q Were Exhibits One through Eight prepared under your direct supervision?

A Yes, they were.

Q Is there anything with respect to the application that I failed to ask you which you feel would be important to the Commission in their consideration of the application?

A No, I believe we covered the exhibits pretty well.

MR. CHRISTY: That's all I have on direct.

CROSS EXAMINATION

BY MR. STAMETS:

Q If someone else is going to testify to these questions that I am going to ask you, just advise me, and we will delay this.

MR. CHRISTY: The second witness is only going to testify to the economics.

Q (By Mr. Stamets) What is the drive mechanism in this particular field?

A It is my opinion that it is primarily pressure depletion. I see no evidence to date of any waterdrive, active waterdrive mechanism.

Q Can the oil wells in here be developed on 80-acre spacing and allowed to produce without waste?

A We are proposing at this time at least 320-acre spacing for oil wells.

Q Maybe I should have said produced on 80-acre allowables and drain 320 acres without waste?

A Yes. From the indications that I have seen, it is my opinion that they could, and that the 80-acre allowable is quite adequate at this time. I might mention at this time that all of the wells are producing with gas-oil ratios which would give them gas classifications. However realizing the possibility that there may be some subsequent completions which might be predominantly

oil, we are proposing this allowable to protect against excessive withdrawal from the pool rather than asking for some larger allowable.

Q Mr. McIntosh, you have proposed a limit on production of oil wells of 267 barrels per day?

A Yes.

Q Do you propose a similar limit on liquid production from gas wells, or does that work out automatically with your GOR limit?

A We are proposing the same withdrawal from both type wells.

Q And from the indications you have now, is this primarily a gas pool with some oil production as well?

A Yes, that's true.

MR. STAMETS: Are there any other questions of this witness?

MR. CHRISTY: I would like to ask one additional question.

* * * *

REDIRECT EXAMINATION

BY MR. CHRISTY:

Q I didn't ask you this question, but I gather from your testimony that you are not real positive of what is going to occur here. Would you suggest these rules be temporary for a couple of years, and see what develops?

A I think that would be a good idea to have them

considered as temporary for a period of perhaps two years. We do not have a long production history on the wells, as I mentioned, three of them were completed as oil wells and have since gone to very high ratios, and would not come within a gas classification. But it's possible that subsequent history from this area could call for some other spacing.

For that reason, perhaps it would be good to consider them temporary.

MR. CHRISTY: That's all I have.

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RE-CROSS EXAMINATION

BY MR. STAMETS:

Q With reference to Exhibit Eight, the initial first tests you took on the Preston Federal Well in December of 1971, this shows pressure of something in excess of 2400 pounds.

A Yes, that's true.

Q And immediately above that in the same month, you have test pressure for the Robin Federal that is just below 2600 pounds, and a test on the Vickie Federal of just over 2600 pounds. Now, was that taken before those wells were shut in,or while they were shut in, or some time after? I am trying to get at why the Preston test was considerably lower than these two wells which

are supposed to be causing the interference.

A This was a seventy-two-hour test on the Robin Federal Well. The first test taken on the Preston was taken while those two wells were producing, and the well wasn't in effect being drained. When the second test was taken, pressures were taken on the Robin and the Vickie, and the pressure had increased 300 pounds in that interval.

MR. STAMETS: If there are no further questions, the witness may be excused.

(Witness excused.)

MR. CHRISTY: At this time, I offer into evidence Applicant's Exhibits One through Nine inclusive, including Number One and Number Nine as amended by the testimony of the witness.

MR. STAMETS: Without objection, they will be admitted in evidence.

(Whereupon Applicant's Exhibits One through Nine were admitted in evidence.)

MR. CHRISTY: At this time, I will call Roger C. Hanks.

* * * *

ROGER C. HANKS,

was called as a witness, and after being duly sworn according to law, testified as follows:

DIRECT EXAMINATION

BY MR. CHRISTY:

Q Would you please state your name and address?

A Roger C. Hanks, Midland, Texas.

Q You are the operator of the wells involved in Case 5048?

A True.

Q Would you tell us, Mr. Hanks, what the drilling and completion costs of these four wells in the area were?

A Drilling these wells to completion cost approximately $225,000 each.

Q I understand that you had to purchase and deepen a salt water disposal well including a salt water gathering system for these wells to produce?

A That was the Monsanto Foster up there in Section 5.

Q What was the cost of that?

A Around $275,000.

Q Including the disposal system?

A Including seven miles of line with a six-inch cement conduit.

Q I assume that because of the high gas, you had to build the gas gathering system to dispose of the gas from these wells?

A That's correct.

Q What was the cost of them?

A Two hundred twenty-five thousand dollars.

Q Where does the gas go now from these four wells?
A There's a compressor set at the Robin, and we have it compressed to the I. B. field line, and therefore our gas goes to the I. B. Processing Plant and they process it.
Q I believe you have drilled a number of wells in Southeastern New Mexico, have you not?
A Correct.
Q Can you economically at this time develop this proposed area on 160-acre spacing?
A No way. Like, it costs approximately $4,000 a month without any allocations for depreciation to operate these wells, and we are generating $3,000 a month in income. So something has got to happen, hopefully the water will go down and the gas will go up. That's our theory. It worked to the north over in Mr. Ramey's country, and we hope it works here.
Q So this, I gather, is an extremely marginal operation at best?
A I would say it would be very marginal if it loses $4,000 a month.
Q Do you presently plan any drilling in the unit area?
A No.

MR. CHRISTY: That's all I have.

* * * *

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Hanks, you are looking at this as a salvage operation as far as you are concerned, is that right?

A Very definitely.

Q You don't anticipate any dramatic change in the situation in the near future?

A Yes, I honestly do, but I can't predict exactly the date. In other words, if you move the volume of water out of the reservoir, we possibly will get a reaction. To try to deplete this mammoth amount of water, we are trying things all the time.

Of course, you have to get a volume of water moving out of the reservoir in order to deplete the water and increase the hydrocarbons.

Q If pool rules were established for a temporary period of two years, would you be willing to file a short report at the end of every six months outlining the current situation there?

A Very definitely.

MR. STAMETS: Are there any other questions of the witness?

(No response)

MR. STAMETS: The witness may be excused.

(Witness excused.)

MR. STAMETS: Anything further?

MR. CHRISTY: We certainly have a marginal situation at this time, and as the witness stated, we do hope it will improve. We would seek the proposed rules as amended by the testimony.

There is precedent before this Commission for 320-acre spacing, and I refer to Rule R-2565 in 1966, and amended in 1970. I refer also to R-4581 in 1973. That's all for the Applicant.

MR. STAMETS: Is there anything further in this case?

(No response)

MR. STAMETS: Case 5048 will be taken under advisement.

* * * *

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, RICHARD E. McCORMICK, a Certified Shorthand Reporter, in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings to the best of my knowledge, skill and ability.

Richard E. McCormick
CERTIFIED SHORTHAND REPORTER

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 5048, heard by me on August 22, 1973.

Richard L. Stamets, Examiner
New Mexico Oil Conservation Commission

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

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

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

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

I N D E X

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

* * *

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

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

EXAMINER STOGNER: Call for appearances.

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

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

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

EXAMINER STOGNER: Are there any objections?

MR. KELLAHIN: No objection, Mr. Examiner.

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

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

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

MR. KELLAHIN: Yes, sir.

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

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

EXAMINER STOGNER: Do you have any witnesses?

MS. COOGAN: No.

MR. STOVALL: Do you have a card?

MS. COOGAN: Pardon me?

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

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

EXAMINER STOGNER: Are there any other appearances?

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

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

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

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

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

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

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

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

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

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

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

MR. KELLAHIN: I anticipate calling four witnesses.

EXAMINER STOGNER: And Mr. Carroll?

MR. CARROLL: Two witnesses.

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

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

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

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

(Whereupon the witnesses were duly sworn.)

EXAMINER STOGNER: Mr. Kellahin I believe has some

opening remarks at this time.

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

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

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

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

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

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

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

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

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

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

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

MS. COOGAN: No, I don't.

EXAMINER STOGNER: Mr. Kellahin.

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

JERRY HOOVER,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

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

Incorporated in Midland, Texas.

Q. You are a petroleum engineer by education?

A. That is correct.

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

A. Yes, I have.

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

A. Yes, I have.

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

A. I have.

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

EXAMINER STOGNER: Are there any objections?

MR. KELLAHIN: None.

EXAMINER STOGNER: Mr. Hoover is so qualified.

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

A. Yes.

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

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

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

A. Yes, in the geological presentation.

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

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

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

A. That's correct.

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

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

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

A. Yes, that's Exhibit 2.

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

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

spacing.

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

A. That's correct.

Q. What happened then?

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

Q. What happened then?

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

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

Q. With regards to well spacing and --

A. And allowable.

Q. And allowable?

A. That's correct.

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

A. That is correct.

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

A. 10,000.

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

A. No, we're not.

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

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

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

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

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

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

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

MR. CARROLL: None.

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

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

EXAMINER STOGNER: Mr. Carroll, your witness.

MR. CARROLL: I have no questions.

EXAMINER STOGNER: Miss Coogan, your witness.

MS. COOGAN: No questions.

EXAMINATION

BY EXAMINER STOGNER:

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

A. That is correct.

Q. Has that always been so?

A. That was changed in a ruling in 1977.

Q. What order would that be?

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

Q. R-5565?

A. That's correct.

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

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

A. That is correct.

Q. I didn't even know about that.

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

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

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

EXAMINER STOGNER: Mr. Kellahin.

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

CLYDE FINDLAY,

the Witness herein, having been first duly sworn, was

examined and testified as follows:

EXAMINATION

BY MR. KELLAHIN:

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

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

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

A. No, sir.

Q. Summarize for us your education?

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

Q. In what year, sir?

A. Petroleum engineering in 1985.

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

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

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

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

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

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

A. Yes, sir.

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

A. Yes, sir.

Q. You made yourself familiar with the pressure information?

A. Yes, sir.

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

A. Yes, sir.

Q. Have you reached such a conclusion?

A. Yes, sir.

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

EXAMINER STOGNER: Are there any objections?

MR. CARROLL: None.

EXAMINER STOGNER: Mr. Findlay is so qualified.

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

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

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

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

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

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

A. Yes.

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

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

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

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

A. That's correct.

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

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

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

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

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

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

A. Yes.

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

A. Yes.

Q. Have you done that?

A. Yes.

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

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

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

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

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

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

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

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

Q. The legend at the lower right of the display

identifies what for us, Mr. Findlay?

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

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

A. That's correct.

Q. Are those on effective 40-acre spacing?

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

Q. Has that drilling been too dense?

A. Not in our experience.

Q. Why not?

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

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

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

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

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

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

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

A. Drill additional wellbores.

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

A. Can you repeat.

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

A. Yes.

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

A. Yes, sir.

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

A. Yes.

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

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

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

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

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

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

A. That's correct.

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

A. Blue.

Q. Tell me what it shows.

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

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

A. Yes, sir.

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

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

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

A. That's correct.

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

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

Q. Increased allowable would give you that flexibility then?

A. That's correct.

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

A. Yes, sir.

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

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

production.

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

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

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

A. No, sir.

Q. Are there any gas wells in either pool?

A. Yes, there are.

Q. What's the explanation for their occurrence?

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

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

difference?

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

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

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

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

A. Not at this time.

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

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

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

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

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

Q. What's the major point?

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

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

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

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

A. That's correct.

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

A. I guess west of it.

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

A. Yes.

Q. What's the comparison?

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

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

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

A. Yes.

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

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

Q. Was it produced to its economic limit?

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

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

A. Yes.

Q. What's that?

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

3,000 pounds. I also list initial pressure for the Barbara Federal No. 9, 20 years later, at about 1700 pounds. That's the second part of my testimony.

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

A. All right.

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

A. Yes.

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

A. No, sir, I would not have.

Q. Why not?

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

Q. Only 40 acres away?

A. That's correct.

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

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

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

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

Q. Draw the relation for us on pressure now?

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

Q. We're still in Section 18?

A. That's correct, southeast quarter.

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

A. Yes.

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

A. That's correct.

Q. Tell us what it shows.

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

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

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

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

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

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

A. Yes, sir.

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

A. Yes.

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

are in black, the infill wells are in red?

A. Yes.

Q. You have tabulated the bottomhole pressure for each?

A. Yes.

Q. What is the conclusion?

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

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

A. Yes, sir.

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

A. I took the original 1976 pool rule assumption of

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

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

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

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

A. Yes, I have examined that.

Q. What did you find?

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

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

A. No. We would like to show --

Q. Exhibit No. 11?

A. Yes.

Q. Do you have Exhibit No. 11?

A. Yes.

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

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

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

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

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

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

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

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

A. That's correct.

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

A. That's right.

Q. And you examined porosity?

A. That's correct.

Q. How did you do that?

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

Q. Yes.

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

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

A. That's correct.

Q. How did you go about doing that?

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

quarter of Section 18.

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

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

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

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

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

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

it makes the full circle of a compass.

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

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

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

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

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

what those traditional logs read.

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

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

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

A. That's correct.

Q. What number did he have?

A. 272,000 barrels of oil.

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

you would get using his values for this well?

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

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

A. That's correct.

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

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

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

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

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

A. Conservative estimate using our parameters we

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

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

A. That's correct.

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

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

Q. You're looking at Exhibit 14?

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

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

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

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

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

A. That's correct.

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

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

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

A. Yes.

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

A. That's correct.

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

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

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

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

A. No, sir.

Q. You get zero?

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

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

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

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

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

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

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

A. That's correct.

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

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

Q. When was it completed?

A. In 1971.

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

A. Yes, sir.

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

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

Q. What was its potential?

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

Q. Yes.

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

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

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

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

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

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

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

A. No, sir, I don't.

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

A. No, sir, not in my opinion.

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

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

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

A. Yes, I believe it will.

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

A. Yes, sir, I do.

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

EXAMINER STOGNER: Are there any objections?

MR. CARROLL: None.

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

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

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

come back for cross-examination.

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

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

EXAMINER STOGNER: This hearing will come to order. Any cross-examination, Mr. Carroll?

MR. CARROLL: None, Mr. Examiner.

EXAMINER STOGNER: Miss Coogan.

MS. COOGAN: No.

EXAMINATION

BY EXAMINER STOGNER:

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

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

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

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

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

A. No, sir. These old wellbores are

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

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

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

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

A. Yes, sir.

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

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

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

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

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

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

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

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

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

MR. KELLAHIN: No, sir.

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

MR. KELLAHIN: I call Jim Ballard.

JAMES H. BALLARD,

the Witness herein, having been first duly sworn, was

examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

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

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

A. No, I have not.

Q. Summarize your educational background for us?

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

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

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

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

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

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

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

EXAMINER STOGNER: Are there any objections?

MR. CARROLL: None.

EXAMINER STOGNER: Mr. Ballard is so qualified.

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

A. That is correct.

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

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

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

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

presented.

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

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

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

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

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

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

towards South Dagger Draw?

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

EXAMINER STOGNER: Are there any objections?

MR. CARROLL: None.

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

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

EXAMINER STOGNER: Mr. Carroll, your witness.

MR. CARROLL: No questions.

EXAMINER STOGNER: Miss Coogan.

MS. COOGAN: No questions.

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

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

LESLIE HALL,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

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

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

A. I never have.

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

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

Conoco's application for this hearing.

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

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

Q. That serves well in this field.

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

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

A. Yes, I have.

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

A. Yes, sir.

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

A. It does.

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

Miss Hall as an expert petroleum landman.

EXAMINER STOGNER: Are there any objections.

MR. CARROLL: None.

EXAMINER STOGNER: Miss Hall is so qualified.

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

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

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

A. Yes, sir.

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

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

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

A. Yes, sir.

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

A. That's correct.

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

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

Q. For a mile?

A. Yes.

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

A. That's correct.

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

A. That's correct.

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

A. 20 is a notification that we sent out to

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

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

A. That's correct.

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

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

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

A. That's correct.

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

EXAMINER STOGNER: Are there any objections?

MR. CARROLL: None.

MS. COOGAN: No.

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

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

EXAMINATION

BY MR. STOVALL:

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

A. We believe it is.

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

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

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

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

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

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

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

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

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

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

EXAMINER STOGNER: With that I have no questions.

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

MR. STOVALL: Mr. Carroll.

MR. CARROLL: I would first call Kathy Porter.

KATHY PORTER,

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

DIRECT EXAMINATION

BY MR. CARROLL:

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

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

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

A. That's correct.

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

EXAMINER STOGNER: Are there any objections.

MR. KELLAHIN: No objection.

EXAMINER STOGNER: Miss Porter is still qualified.

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

A. That's correct.

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

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

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

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

A. Yes.

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

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

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

A. Yes.

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

A. That's correct.

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

A. Yes.

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

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

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

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

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

A. Not to my knowledge, no, sir.

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

persons concerning today's hearing?

A. Right.

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

A. No, sir.

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

A. What I said previously, that is correct.

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

EXAMINER STOGNER: Mr. Kellahin?

MR. KELLAHIN: No questions.

EXAMINER STOGNER: Miss Coogan.

MS. COOGAN: No questions.

EXAMINER STOGNER: No questions either at this point.

MR. CARROLL: We next call Dave Boneau.

DAVID FRANCIS BONEAU,

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

DIRECT EXAMINATION

BY MR. CARROLL:

Q. Would you please state your name, your

occupation and by whom you are employed?

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

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

A. Yes, sir.

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

EXAMINER STOGNER: Are there any objections?

MR. KELLAHIN: No, objection.

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

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

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

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

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

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

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

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

illustrating that point.

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

A. Yes, sir, that's correct.

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

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

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

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

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

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

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

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

A. Yes, sir, that's correct.

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

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

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

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

Q. That is Yates's position?

A. Yes, sir.

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

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

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

A. Yes, sir.

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

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

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

Exhibits 1, 2, 3 which we presented today.

EXAMINER STOGNER: Are there any objections?

MR. KELLAHIN: No objection

MS. COOGAN: No.

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

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

EXAMINER STOGNER: Thank you, Mr. Carroll. Mr. Kellahin, your witness

MR. KELLAHIN: Thank you, Mr. Stogner.

CROSS-EXAMINATION

BY MR. KELLAHIN:

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

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

stipulation of two wells per quarter section.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Q. Is both North and South?

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

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

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

A. Certainly.

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

A. Yes, sir.

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

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

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

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

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

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

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

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

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

A. Yes.

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

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

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

A. Yes, sir.

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

dots?

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

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

A. Those scenarios are detailed on the second page.

Q. Okay.

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

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

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

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

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

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

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

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

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

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

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

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

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

sir. No further questions.

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

MR. CARROLL: None.

EXAMINER STOGNER: Miss Coogan?

MS. COOGAN: No questions.

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

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

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

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

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

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

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

MS. COOGAN: I have none. Thank you.

EXAMINER STOGNER: Mr. Carroll.

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

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

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

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

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

* * *

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

REPORTER'S CERTIFICATE

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

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

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

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 7 February 1991.

Examiner
Oil Conservation Division