STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BLDG.
SANTA FE, NEW MEXICO

10 October 1985

EXAMINER HEARING

IN THE MATTER OF:

Application of TXO Production Corporation for compulsory pooling, Lea County, New Mexico.	CASE 8719
Application of Pennzoil Company for compulsory pooling, Lea County, New Mexico.	CASE 8727

BEFORE: Gilbert P. Quintana, Examiner

TRANSCRIPT OF HEARING

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I N D E X

JEFF A. BOURGEOIS

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REPORTER'S NOTE: This hearing is a continuation of Docket Number 30-85 which is held on 10 October 1985.

MR. QUINTANA: Good morning. We'll continue the hearing for Docket Number 30-85.

This morning we're going to call two cases and consolidate them for purposes of testimony.

We'll call this morning Case 8719 and Case 8727.

MS. LUNDERMAN: Case 8719, application of TXO Production Corporation for compulsory pooling, Lea County, New Mexico.

Case 8727, application of Pennzoil Company for compulsory pooling, Lea County, New Mexico.

MR. QUINTANA: Are there appearances in this case?

MR. VANDIVER: Mr. Examiner, my name is David Vandiver, Dickerson, Fisk, and Vandiver, Artesia, New Mexico, and I'm appearing on behalf of the applicant, TXO Production Corporation.

I'll have at least three and possibly four witnesses.

MR. QUINTANA: Are there other

appearances in the case?

MR. KELLAHIN: If the Examiner please, I'm Tom Kellahin of Santa Fe, New Mexico, appearing on behalf of Pennzoil Company, and I anticipate that I'll have three witnesses.

MR. QUINTANA: Are there other appearances besides these?

MR. BATEMAN: Mr. Examiner, I'm Ken Bateman, White, Koch, Kelly, and McCarthy, appearing on behalf of Texaco.

MR. QUINTANA: Any witnesses?

MR. BATEMAN: No.

MR. QUINTANA: Will all witnesses stand at this time and be sworn in?

(Witnesses sworn.)

MR. VANDIVER: Mr. Examiner, there is a mistake in the publication in Case 8719.

It describes in two places southwest quarter northeast quarter of Section 4, Township 17 South, Range 37 East, and it should be southeast quarter northeast quarter of Section 4.

That's on the third line and the sixth line and then elsewhere in the publication it cor-

rectly describes east half northeast quarter.

MR. QUINTANA: That is correct?

MR. VANDIVER: Yes, sir.

MR. QUINTANA: It will have to be readvertised, then, but we'll go ahead and hear testimony and (inaudible.)

MR. KELLAHIN: Mr. Examiner, a comment on behalf of my company with regards to the typographical error. It is obviously a typographical error. We certainly were not confused by that error. We intend to -- we want to present our case today and not have to come back on the 23rd of October, so we'd like to hear both cases today and come back.

MR. QUINTANA: We'll do that and we'll still readvertise it and I will -- I will recall it again in October just in case there's somebody else that wishes to present something.

If you present all your testimony today, that will be fine and you will not have to return. We'll just leave the docket open.

Mr. Vandiver, you may proceed.

MR. VANDIVER: Thank you, sir.

JEFF A. BOURGEOIS,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. VANDIVER:

Q Would you state your name, please, sir?

A My name is Jeff Bourgeois.

Q And what's your occupation and by whom are you employed, Mr. Bourgeois?

A Petroleum landman with TXO Production Corporation.

Q You testified before the Oil Conservation Division yesterday, is that correct?

A Yes.

Q And your qualifications as a petroleum landman were accepted at that time?

A Yes, they were.

MR. VANDIVER: I would tender Mr. Bourgeois as an expert petroleum landman, Mr. Examiner.

MR. QUINTANA: Yes, he's considered an expert petroleum landman.

Q Mr. Bourgeois, you're familiar with the application in Case 8719?

A Yes, I am.

Q What is the nature and purpose of TXO Production Corporation's application?

A TXO seeks in this order an order pooling all mineral interests from the surface to the top of the Strawn formation to form a standard 40-acre proration unit in the southeast quarter of the northeast quarter of Section 4, Township 17 South, Range 37 East, and also to pool our mineral interest from the top of the Strawn formation through the base of the Strawn formation to form a standard 80-acre proration unit, being the east half of the northeast quarter.

I'd like to point out that this 80-acre proration unit is considering the case of Pennzoil Company heard before the Examiner on September 11th for new field rules to be dedicated to their proposed Shipp Strawn Field, taking that into consideration.

Also we wish to have considered the cost for drilling and completing TXO's Grisso No. 1 Well, the TXO Grisso No. 1 Well, and seeks charges for supervision, designation of TXO as operator, and a charge for risk involved in drilling this well.

Q What is the location of TXO's proposed Grisso No. 1 Well?

A TXO's location is 2310 feet from the north line and 660 from the east line of Section 4.

Q You referred earlier to the special pool rules sought by Pennzoil and that was in Case 8696, is that correct?

A Yes, I believe that is the proper case number.

Q And as far as you know, no order has been entered in that case, is that correct?

A Not to my knowledge.

Q And the purpose of TXO's application in this case is to pool in addition from the surface to top of the Strawn, to also pool the Strawn formation with respect to the southeast quarter northeast quarter in the event the special pool rules are not adopted.

A Yes, that would be correct.

Q Mr. Bourgeois, if you will refer to TXO's, what's been marked for identification as TXO's Exhibit Number One, and describe for the Examiner what that is.

A Exhibit Number One is a land plat showing the proposed location of the Grisso No. 1 Well circled in red. The proposed 80-acre proration unit is outlined in yellow.

Q And what the objective depth of your proposed well?

A Projected depth is to test the Strawn formation at approximately 11,500 feet.

Q Are there any other Strawn, any other wells producing from the Strawn formation in proximity to your proposed location?

A Yes. Pennzoil's Vierson No. 1 Well, located in the northeast quarter southeast quarter of the same section.

Q Do you know the location of that well?

A Yes, sir. I believe that is 2130 feet from the south line and 660 feet from the east line.

Q Mr. Bourgeois, if you would refer to Applicant's Exhibit Number Two and describe what that is.

A Exhibit Number Two are copies of correspondence to the working interest owners and mineral interest owners in the northeast quarter of Section 4, seeking their participation or lease to support our Grisso No. 1 Well.

Q By the way, if I could ask you, Exhibit Number One was prepared by you or under your direction and supervision?

A Yes, it was.

Q And Exhibit Number Two consists of letters prepared by you --

A Yes.

Q -- or under your direction and supervision.

What interest does TXO Production Corpor-

ation own in the east half northeast quarter of Section 4?

A The interest appears to be roughly 6.2 percent.

Q Does TXO control any other interest in that 80-acre tract?

A TXO has an agreement with the APCOT-FINADEL Joint Venture to where when we go buy leases and new prospects, APCOT-FINADEL has a right to purchase an assignment of 25 percent of that leasehold, so TXO/FINA interest in this tract would be a little over 8 percent and we have in seeking the participation of working interest and mineral interest owners of this tract have run across a situation where one or two parties have consented to our location and many other parties are sitting on the fence, if you will, awaiting the outcome of this hearing.

Q So there's -- there's another --

A Yes.

Q -- proposed location in the 80-acre tract?

A Yes.

Q And there are there are other interest owners in that 80-acre tract who have not agreed to pool their interest.

A This is correct.

Q And there -- they haven't refused, is

that correct? They haven't refused to join; they're just awaiting the outcome?

A Some have not refused to join, while others, in the obvious case, Pennzoil is in support of their proposed location.

Q If you could refer to what's been marked for identification as TXO's Exhibit Three and describe what that is.

A Exhibit Number Three is a copy of TXO's proposed Authority for Expenditure for drilling and completing of our Grisso No. 1 Well.

Dry hole costs are roughly $450,000. Total completed well costs are estimated at $715,200.

Q And was that exhibit prepared by you or under your direction and supervision?

A Yes.

Q Have you -- has TXO Production Corporation drilled other wells in the vicinity of your proposed location?

A Yes, we have.

Q And are these costs in line with the costs incurred in your other -- drilling your other wells?

A Yes, they are, and we feel this is a reasonable estimate of the cost to drill this well.

Q Was this AFE the same AFE that was

submitted to the other interest owners to this tract?

A No, I'd like to point out at this time that TXO's Drilling Department, effective September 1st of this year, has gone to taking drilling contract bids on a footage basis as opposed to a day work basis, and also have had become available to them increased casing program discounts. These discounts and lower rates are reflected in the -- this revised AFE, if you will, and therefore the original AFE used, total completed well costs were $797,700 and with the revised AFE the new completed well costs, as previously stated, are estimated at $715,200.

Q If I could refer you, Mr. Bourgeois, to what's been marked for identification as TXO's Exhibit Number Four and ask you what that is?

A Exhibit Number Four is a copy of TXO's proposed operating agreement to cover the operations for the drilling and completing and producing of our Grisso No. 1 Well, and the Examiner should please refer to Exhibit C, the COPAS accounting procedure, on page three we are requesting overhead rates to be $5374 for a drilling well rate per month, and $538 per month for producing well rates.

Q What's the basis for those rates, Mr. Bourgeois?

A We feel these rates are acceptable and

have used rates similar to this in the past and had all parties under the operating agreement consent to these, and also these rates are the rates assigned to this depth of well by our Dallas Accounting Department.

Q If I could refer you to TXO's Exhibit Number Five and have you describe for the Examiner what that is?

A Exhibit Number Five is an interoffice memorandum circulated by our Dallas Accounting Department and the overhead rates to be used in contracts generated from April 1, '85 forward.

Our district is the West Texas District. In the depth interval from 4000 to 12,000 feet the rates are set out as requested at $5,374 drilling and $538 for producing well rates.

Q What's the basis of that interoffice memorandum?

A It's to give the district offices guidelines as to the overhead rates to be used in contracts.

The COPAS, Council of Petroleum Accountant Societies, has approved these rates and has approved a 2.7 percent increase in overhead -- for overhead rates in effect for contracts dated prior to April 1 of 1985, and so these rates we are requesting are 2.7 percent higher than our previous year's figures.

Q And if I could refer you to TXO's Exhibit Number Six and ask you what that is?

A Exhibit Number Six is a copy of an operating agreement in which TXO drilled its Cambridge Royalty Company No. 1 Well, a Strawn test to a objective depth of 11,500 feet. This well was drilled in November and December of 1984, and the overhead rates used in this contract are 2.7 percent less than the rates we are requesting, and on the signature pages in this contract it will show the parties that consented to these rates.

Q And have the rates proposed by TXO Production Corporation also been accepted by the New Mexico Oil Conservation Division in other cases?

A Yes, they have. In a recent case presented before the Examiner on September 11th, we requested these identical rates for a well in the same 4000/12,000 foot interval and the rates were approved as requested in Orders No. 4-8043, dated October 3rd, 1985.

MR. VANDIVER: I'd ask the Examiner to take notice of that order.

Q Mr. Bourgeois, I'd like to refer you to what's been marked for identification -- first of all, excuse me, could I ask, were Exhibits Four, Five, and Six prepared by you or under your direction and supervision?

A Yes.

Q Now if I could refer you to what's been marked for identification as Applicant's Exhibit Number Seven and ask you what that is.

A Exhibit Number Seven is a copy of TXO's Application for a Permit to Drill, dated August 26th, 1985.

This application for a permit to drillw as approved by the Oil Conservation Division's office in Hobbs, New Mexico, on August 26th, 1985.

The application reflects our location and proposed depth for the Grisso No. 1 Well.

Q And you did testify it was filed and approved August 26th, is that --

A Yes, I believe --

Q -- correct?

A -- copies submitted are stamped approved by Jerry Sexton of the OCD office in Hobbs, New Mexico.

Q You have notified the other interest owners of this hearing, is that correct?

A Yes, we have.

MR. VANDIVER: If I could have a moment, Mr. Examiner, I have not marked the affidavit of mailing.

Mr. Examiner, I'm getting my exhibits out of order but this is one I haven't submitted to you.

Q Mr. Bourgeois, if I could hand you what's been marked for identification as Applicant's Exhibit Number Fourteen and ask you what that is.

A Exhibit Number Fourteen is an affidavit of mailing prepared by the offices of Dickerson, Fisk, and Vandiver, to reflect that a copy of TXO's application in this case has been mailed to the parties listed on this affidavit notifying all parties of this hearing.

Q Do you have anything you wish to add to your testimony?

A No, not at this time.

MR. VANDIVER: Mr. Examiner, I would move the admission of Exhibits One through Seven and Exhibit Fourteen as evidence in this case.

MR. QUINTANA: Exhibits One through Seven and Exhibit Number Fourteen will be accepted as evidence.

MR. VANDIVER: And I'll pass the witness.

MR. QUINTANA: Mr. Kellahin?

MR. KELLAHIN: Thank you, Mr. Quintana.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q Mr. Bourgeois, if you'd refer to your Exhibit Number One, sir, I'd like to ask you some questions about what is taking place in the immediate area.

I note on your Exhibit Number One you've outlined in yellow the east have of the northeast quarter, which is the 80-acre spacing unit that's in question.

Am I correct in understanding, sir, that both you and Pennzoil are in agreement about the orientation of that spacing unit if the Commission adopts 80-acre spacing?

A Yes, it is my understandxing that we are in agreement.

Q All right. When we look to the -- what has been characterized in the hearing 8696 as the Shipp Strawn Pool, the discovery well was the Pennzoil Viersen No. 1 Well, was it not?

A That's correct.

Q All right. Approximately where is that well located when we look at Exhibit Number One?

A Okay, Exhibit Number One, you refer to, it is marked on this exhibit as a black dot, the number one to the right. It might be difficult to read but that's the Pennzoil Viersen, and as I stated earlier, I believe its lo-

cation to be 2130 feet off the south line and 660 feet off the east line.

Q All right. What is your understanding, Mr. Bourgeois, about the spacing or proration unit that is to be dedicated to the Viersen No. 1 if 80-acre spacing is adopted?

A It is my understanding that the 80-acre proration unit to be dedicated to the Pennzoil Viersen No. 1 will be the east half of the southeast quarter of the same section.

Q When we look at the northeast quarter of Section Number 5, regardless of what the spacing is for that 160 acres, is that ownership undivided for the whole 160?

A Yes.

Q We have the same individuals shown in the east half as in the west half with the same percentages?

A To my kowledge that's correct, yes.

Q All right. One of the differences that you described for us between Pennzoil and TXO is a difference about well location for the well in the east half of the northeast quarter, is that correct?

A Yes.

Q Your location is in the south 40 and Pennzoil's proposed location is in the north 40 of that unit.

A Uh-huh.

Q All right. So that we talk about the well names consistently --

A Okay.

Q -- yours is the Grisso No. 1, is that correct?

A Right.

Q And Pennzoil as referred to their well location as the Shipp No. 2, I believe, is that correct?

A Yes, the B. E. Shipp Estate No. 2.

Q All right. Now, Mr. Bourgeois, is there to be a B. -- I forgot all the letters -- Shipp No. 1 Well somewhere?

A Yes. That location, as proposed by Pennzoil, is located 1980 feet from the north line and 1980 feet from the east line of Section 4.

Q All right, the B. E. Shipp No. 1 Well by Pennzoil, then, would be in the west half of the northeast quarter.

A That's correct.

Q And within that west half, then, it will be in the south forty.

A Correct.

Q Has TXO consented or agreed to join Pennzoil in Pennzoil'd drilling and operation of that Shipp No.

1 Well?

A Yes, we have executed their AFE and returned it to their office.

Q You have described for us in your testimony, Mr. Bourgeois, some cost numbers and you've given us a revised AFE of about $715,000 for a completed Strawn well.

A That's correct.

Q How does that number compare with the costs of the Viersen No. 1 Well that Pennzoil drilled?

A I do not know.

Q How does that cost number compare to the proposed cost for the B. E. Shipp No. 1 Well?

A It is -- they are not identical but there is a reasonable proximity, if you will. I have their AFE, I believe, in my briefcase.

Q On behalf of your company, Mr. Bourgeois, is there a dispute between the operators that is focused on the cost of the Strawn wells?

A Not to my knowledge. No one has raised a beef about the estimated cost of either AFE.

Q So the cost is not what we're here to resolve.

A That's right.

Q With regards to the operating agreement, you have given us a proposed operating agreement that's your

Exhibit Number Four.

Have you received from Pennzoil an operating agreement for the well that they have proposed in the east half of the northeast quarter?

A Yes, I have.

Q Are there any material differences between the operators over the proposed operating agreement?

A There are numerous additional provisions in each operating agreement and I think that once an operator is designated, the differences, we'll be able to work it out.

There's a -- Pennzoil's a rather lengthy discussion that I have been informed was requested by another non-operating party, and TXO's additional provisions are standard, in that we tried to have them incorporated into all our operating agreements that we prepare.

Q All right. So you don't anticipate that we need the Division to resolve this case in terms of the differences in the proposed operating agreements.

A That's correct.

Q All right. When we look at the overhead charges, Mr. Bourgeois, is there a material difference between the two operators over what each proposes to charge for overhead charges?

A The difference in Pennzoil's overhead re-

quested rates are $5500 a month, drilling well rate, and $550, producing well rate, so it's not a big difference.

Q The principal difference, then, as it appears, is a difference of opinion as to where the well ought to be located.

A That's part of the principal difference. The principal difference is twofold, I believe.

TXO wishes to have the east half northeast location drilled at our proposed location and TXO also seeks to be designated as operator.

Q Let's talk about TXO's experience in the area, Mr. Bourgeois. Does TXO operate any Strawn wells within the area shown on your Exhibit Number One?

A As far as current operations, no, I don't believe so.

Q The operating agreement that you referred to as a comparison was the Cambridge Strawn Well you have over in Township 16 South, 35 East. I believe it's your Exhibit Number Six.

A Okay.

Q Is that your closest Strawn well that TXO operates to this area?

A Just give me a minute and I'll try to run it through.

I believe it is.

Q Can you approximate for us, Mr. Bourgeois, how far this Cambridge Strawn Well is from the subject acreage?

A Two townships to the northwest, 16, 35, as opposed to 17, 37.

Q Your correspondence, which is marked and has been introduced as Exhibit Number Two, Mr. Bourgeois, you referred in your direct testimony to the fact that TXO's interest in the east half of the northeast quarter was approximately 6.2 percent. Does that represent TXO's interest in that spacing unit prior to August 23rd, '85, which is the date of your first letter here in Exhibit Two?

A Yes, I -- we have not picked up any new leases since that date. We have -- are in the process of negotiating one but have not received an executed lease.

Q Does this August 23rd, '85 date come before or after the completion of the Pennzoil Vierson No. 1 discovery well?

A I believe that would come after the completion date. I do not know the reported completion date but I believe this is shortly afterwards.

Q Does the August 23rd, '85 correspondence represent TXO's first efforts to form a voluntary unit for the east half of the northeast quarter by acquiring addi-

tional leases, farmouts, or participation?

A Yes, it does.

Q Is the arrangement between TXO and APCOT-FINADEL one that was in existence prior to August 23rd of '85?

A Yes.

Q Do you have an opinion as to whether or not TXO and APCOT-FINADEL would have had consistent positions with regards to TXO's operation of this proposed well prior to August 23rd of '85?

A If I understand your question, APCOT-FINADEL usually goes along with what TXO proposes, although they do have the option to go nonconsent in the event that we're under an operating agreement.

Q In your opinion, then, would APCOT-FINADEL have participated in TXO's position prior to efforts to get others to join your position? You control that interest or by agreement have their participation.

A Like I said, they will have the option to go nonconsent but they usually -- they -- they do go along with us.

Q All right. When we combine the APCOT-FINADEL interest and the TXO interest, we have approximately 8 percent interest at this point that supports TXO's operation of the proposed well?

A That is correct as to the interest of TXO and APCOT-FINADEL.

We have since received correspondence from SOHIO Petroleum Corporation, interest of an undivided 6.25 percent underlying the whole northeast quarter, and they have corresponded with us to the fact that they support our location.

Q With regards to the location, then, you have support from SOHIO, which is about 6.25 percent. Do you have support from any other working interest owners in the spacing unit that support your location?

A As far as signed AFE's back in my office, there's an additional interest, let's say one percent, and the remaining interest I have been in contact with, the majority of them are, like I said earlier, just sitting on the fence awaiting the outcome of this hearing so as not to put a cloud on their interest.

Q Has SOHIO signed your AFE?

A No, we did not receive it back in our office signed. The Federal Express letter was received Tuesday morning, October 8th, in our office in Midland, Texas, indicating their support of our location.

Q Do you have correspondence from any other working interest owners that -- that supports your interest without committing themselves to a signed AFE or an operat-

ing agreement?

A I do have other pieces of correspondence from other parties but none that would explicitly put themselves in favor of our location as opposed to Pennzoil's proposed location.

Q The one percent interest you identified just now, can you give a name to that one percent interest?

A Yes. We received a signed AFE, and if you'll give me a second I can state the name correctly.

It's Mr. G. H. VanZant.

Q VanZant. Mr. Bourgeois, have you submitted Exhibit Four, which is TXO's operating agreement or proposed operating agreement for this well, have you submitted that to the working interest owners and to Pennzoil?

A No, I haven't. They were furnished with the AFE and letters, correspondence indicating, should they approve this location, please return the signed AFE and we will forward an operating agreement for their review and execution.

Q Have you received on behalf of TXO a proposed operating agreement from Pennzoil for this well?

A Yes, I have for their -- not for this well, no, sir.

Q For their B. E. Shipp No. 2?

A Yes.

Q You testified early in your direct examination, Mr. Bourgeois, about the spacing case that the Division heard back in September and that pursuant ot that spacing case you have made application in the alternative, either for a 40-acre spacing unit or the 80-acre unit we've been discussing.

Has TXO taken any position for or against 80-acre spacing for this Shipp Strawn Pool?

A No, we had no opposition to this case when presented.

Q All right. Is your company -- is your company willing to consent, then, in the development of this Strawn Pool on 80-acre spacing?

A Yes, we are.

Q Thank you.

MR. KELLAHIN: Nothing else, Mr. Quintana.

CROSS EXAMINATION

BY MR. QUINTANA:

Q Mr. Bourgeois, what is the location of that B. E. Shipp No. 2 Well?

A B. E. Shipp No. 2, I believe, is going to be 660 feet from the north line and 810 feet from the east line.

Q And you stated so far you have SOHIO Petroleum support of your location and that you're offered approximately one percent additional support?

A Yes.

Q But other than that everybody else is just kind of waiting back to see what's going ot happen with this hearing.

A With -- with the exception of Pennzoil, of course, they're in support of their application.

Q What's the approximate percent of Pennzoil's interest in this?

A I believe their interest to be in the neighborhood of 39 percent. I understand there are some farm-in agreements, and such, that Pennzoil has negotiated.

Q You also stated Exhibit Number Three, which shows the AFE costs for the Grisso Well, the working interest owners do not have a copy of this at this time?

A No.

Q The proposed (not clearly understood.)

MR. QUINTANA: I have no further questions.

Does anyone have questions of the witness?

MR. BATEMAN: Yes, I do.

MR. QUINTANA: Mr. Bateman?

CROSS EXAMINATION

BY MR. BATEMAN:

Q Mr. Bourgeois, do you show an interest on behalf of Texaco Producing?

A Yes, Mr. Bateman, I do, and I have corresponded and conversed with the landman at Texaco's office in Midland, indicating that Texaco does support TXO's proposed location, subject to the approval of the partners in the East Lovington Unit, an operating agreement in effect between TXO -- I mean, excuse me, between Texaco and several other parties.

Texaco has consented to our location subject to the approval of these other parties.

Q What percentage interest do you show for Texaco?

A A little under one percent, I believe, is Texaco's undivided working interest in that northeast quarter.

And the East Lovington Unit's interest I believe to be, roughly, 16 percent.

Q When did you last speak or correspond with Texaco?

A I spoke with a landman at their office Tuesday morning, October 8th.

MR. BATEMAN: No further questions.

MR. QUINTANA: Are there further questions of the witness?

MR. VANDIVER: Yes, sir, Mr. Examiner.

REDIRECT EXAMINATION

BY MR. VANDIVER:

Q Mr. Bourgeois, you were asked about the mineral ownership of the northeast quarter of Section 4, and I believe you testified that the mineral ownership is common throughout that quarter section?

A Yes.

Q Do you know about the mineral ownership of the southeast quarter?

A Yes, I have seen it.

Q Is that mineral ownership common throughout the southeast quarter?

A Is it -- the mineral interests are undivided underneath the southeast quarter.

Q Is the mineral ownership in the southeast quarter common with the mineral ownership in the northeast quarter of Section 4?

A No, it is not.

Q Is there any common ownership among the mineral owners in the southeast quarter and the northeast quarter?

A I do not believe so.

Q Mr. Bourgeois, if TXO's application is granted in this case, do you believe there will be any non-consenting working interest owners?

A It's hard for me to predict the reaction of Pennzoil in this case. I believe I could say there are numerous parties who are awaiting to join at either location but at this time have not committed, and those parties, I'm confident, will be prepared to join in participation in this well.

As far as Pennzoil, I'm not sure of their stance on this, on the case if TXO's successful.

Q If TXO's application is approved, do you anticipate that TXO will be able to pick up more leasehold interest in the northeast -- east half northeast quarter?

A Yes, I would, I would believe so.

Q You were asked about the Cambridge Strawn Well, which is reflected by TXO -- the operating agreement which has been admitted as Exhibit Six. Does TXO operate other Strawn wells in Lea County, New Mexico?

A I'm not sure that there are any other Strawn wells; however, there are numerous other wells rang-

ing in depth from 5000 to the low of 13,000 feet.

Q How many wells at that depth did TXO Production Corporation drill in 1984?

A In Lea County?

Q In Lea County, New Mexico?

A We have drilled, one, two, three, four, five, six, as far as my immediate recollection goes, roughly six, in 1984 to this depth or deeper.

Q And in 1985?

A Approximately two to at least this depth, or deeper.

Q To reiterate your previous testimony, TXO owns or controls 8 percent interest in the east half northeast quarter, approximately?

A Yes, approximately.

Q And SOHIO, which owns 6.25 percent has approved your location?

A Yes, they have.

Q And you have had a commitment from Mr. VanZant, who owns an additional one percent?

A That's correct.

Q And subject to Texaco's approval from its other --from the other parties with whom it is associated, you anticipate you may have an additional sixteen percent?

A That's correct.

Q That will approve your location?

A Yes.

Q And what we're discussing today is who is going to be appointed operator and who will -- which location will be drilled in this 80-acre tract.

A This is correct.

MR. VANDIVER: I'll pass the witness, Mr. Quintana.

MR. QUINTANA: Mr. Kellahin?

MR. KELLAHIN: Nothing further, Mr. Quintana, at the present time.

MR. QUINTANA: Are there further questions of the witness?

You may be excused at this time.

ANDREW T. O'HARE,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. VANDIVER:

Q Mr. O'Hare, for the record would you state your name, occupation, by whom you're employed?

A My name is Andrew T. O'Hare and I'm a

petroleum geologist, employed by TXO Production in Midland.

Q You testified as an expert witness before the Oil Conservation Division on October -- yesterday, October 8th, I believe?

A October 9th, yes.

Q October 9th, and your qualifications were accepted at that time?

A Uh-huh.

MR. VANDIVER: I will tender Mr. O'Hare as an expert petroleum geologist, Mr. Quintana.

MR. QUINTANA: He is considered an expert.

Q Mr. O'Hare, are you familiar with TXO's application in this case?

A Yes, I am.

Q And have you made a geologic study of the area in question?

A Yes, I have.

Q If I could refer you to what's been marked for identification as TXO's Exhibit Eight and ask you to describe that for the Examiner?

A Exhibit Number Eight is a production map of the local area surrounding our proposed location.

In that area 28 total wells have been drilled.

Of that 28, 8 wells were producing, or are still producing in the Paddock formation.

22 of those 28 wells penetrated the Tubb formation, and of that one is producing.

22 wells of that 28 penetrated the Drinkard formation and of that 7 are producing, or have produced.

And of that 28, 14 penetrated the Strawn formation and of that 8 are producing.

I might state that in the production books put out by the OCD the Getty State 1-U Well is listed as Pennsylvanian but it is correlative with the Strawn formation, so it's a Strawn producer. (Inaudible)

Q Mr. O'Hare, what's the distance of the Pennzoil Viersen No. 1 from TXO's proposed location in this case?

A It is approximately 840 feet. Directly north.

Q Mr. O'Hare, if I could refer you to what's been marked for identification as TXO's Exhibit Number Nine and ask you to describe that for the Examiner.

A Exhibit Number Nine is a structure map on top of the Strawn formation.

The wells in pink are either currently producing Strawn wells or wells that have produced from the

Strawn.

Five of the wells shown, of which are four in the Casey Field in the northeast part of the diagram, and one in the southwest part of the diagram, the David Fasken Consolidated State No. 2, are considered economic producers, and at this point the Pennzoil Viersen No. 1 appears to be an economic well (not understood.)

The map demonstrates no structural closure and regional dip is generally to the east/northeast.

The Strawn reservoir is considered, therefore, a pure stratigraphic trap.

Q If I could refer you to what's been marked for identification as TXO's Exhibit Number Ten and ask you what that is.

A Exhibit Number Ten is a Strawn porosity map with a cutoff of approximately 4 percent. Porosities in excess or equivalent to that are shown to be contoured in the wells that penetrated the Strawn formation.

The Strawn porosity thicks shown are considered to be algal mounds and on the map shown there are generally two linear trends of these mounds which are elliptical in shape and trend roughly northeast/southwest.

The Casey Field in the north -- north half of Section 34 and the closure surrounding the Texaco Carter No. 1 Well, and then the closure further south and

west surrounding the Getty Meyers No. 1 and the Getty 1-U, Getty State 1-U No. -- the Getty State 1-U well, are the first north strike of those elliptical mounds.

The second set starts in the northeast with the Mesa Petroleum West Knowles No. 7, moving through the Viersen, Pennzoil Viersen No. 1 discovery, and then further south and west to the David Fasken Consolidated State No. 2 Well.

I have drawn the porosity thick around the Pennzoil Viersen No. 1 based on all available geologic evidence and I may add that the porosity thick trends on strike with the other algal mounds in the area and I may further add that it is fairly optimistic, optimistic interpretation.

Of course, this can be drawn in any shape or fashion but I feel as if I've kept my interpretation to regional geology.

Q Why do you say it's optimistic?

A The elliptic porosity thick could be drawn to cover the entire section of Section 4 and Section 3 but due to the relative size of these porosity thicks in the area shown on the map, and in the area surrounding this area not shown on the map, I feel as if it is a conceivable size.

Q And what do you conclude from the information contained in Exhibit Number Ten?

A I conclude that the porosity units are very sporadic and disappear over very short distances, even as close as one standard proration unit; therefore, there is a good chance that our proposed location may have a much thinner porosity interval or possibly none at all.

Q If I could refer you to what's been marked for identification as TXO's Exhibit Eleven, which is your cross section A-A', and ask you to describe the information contained in that exhibit?

A I've put it on the wall, and those of you who can't see it from there, can look on it on the desk.

The cross section runs roughly northeast/southwest and it trends through the David Fasken Consolidated State No. 2 Well and the Read and Stevens Blackmar No. 1, the Tipperary Oil and Gas Corp. John State No. 4-1, the Pennzoil Viersen No. 1, and the Texaco Oil Carter in the section just north.

The first four wells demonstrated trend along that previously discussed northeast/southwest strike of these algal mounds.

Porosity from a producing interval, producing perfed intervals, are demonstrated by the pink and cored -- I mean DST'ed intervals are demonstrated by the green.

Now, as you can see, the David Fasken

State had a substantial porosity development, which I've given 32 feet greater than or equal to 4 percent, which can be (not understood) by each individual geologist.

And I've given the Read and Stevens and Tipperary Oil and Gas wells no actual producing porosity, and on my best estimate, Pennzoil Viersen No. 1 contains approximately 68 feet of 4 percent or greater, again each interval in each individual interpretation.

The Texaco Production Corporation No. 1 Carter, though it appears to demonstrate porosity, had no shows and gave up no fluids when we drilled that well; therefore, due to the (not understood) in the caliper log, I consider this to be (not clearly understood) density log to indicate porosity which is really not (inaudible).

Therefore one can see how over just a short distance these porosity units can come and go; can be easily described as ephemeral, sporadic, and lenticular, and again I may state that there is still a possibility and chance that the porosity could pinch out entirely over our proposed location.

Q If I could refer you to what's been marked for identification as TXO's Exhibit Number Twelve and ask you what that is, please?

A Exhibit Number Twelve is a structure map on top of the Paddock formation. The wells that have pro-

duced or are producing from the Paddock formation are indicated in green.

The nearest proposed -- the nearest producers to our proposed location is the Mesa Petroleum Meyers No. 1 and again if one refers to Exhibit Number Eight, that well produced approximately, and approximately to date, 32,000 barrels -- 37,000 barrels, excuse me, and is currently inactive.

The Mesa Petroleum Hightower penetrated that depth, which is just north of our proposed location, and did not have any producable porosity in it.

I feel as if we make a producing well in the Paddock formation at our proposed location, we would have to penetrate an as yet undetermined and unmapped porosity unit in that formation.

Therefore, I consider it a risky objective at our proposed location.

Q And if I could refer you to what's been marked for identification as TXO's Exhibit Number Thirteen and ask you to describe that for the examiner.

A Exhibit Number Thirteen is a structure map on top of the Drinkard formation. The wells that are producing or have produced from the Drinkard formation are indicated in blue.

Again the well closest to our proposed

location, which is the Mesa Petroleum Meyers No. 1, produced onoly 9000 barrels of oil from the Drinkard formation and was considered -- would be considered an uneconomic objective.

Again, the Mesa Petroleum Hightower No. 1 just north of our proposed location penetrated the interval and contained no economic porosity development.

Therefore, similar to the Paddock formation, I consider this a risky objective at our proposed location.

Q Mr. O'Hare, were Exhibits Eight through Thirteen prepared by you or under your direction and supervision and can you attest to their accuracy?

A Yes, they were, and yes, I can.

Q Based upon your study of the area, Mr. O'Hare, have you arrived at a professional opinion as to the risk penalty which should be imposed on nonconsenting working interest owners if TXO's application is granted in this case?

A Yes, I have.

Q And what's your opinion?

A Well, as previously stated in my description of the geology, the porosity units in the Strawn formation, again, are highly ephemeral, sporadic, and, as previously stated, can pinch out as close as one location, one

standard proration unit away.

We have, therefore, proposed our location as close to the Pennzoil Viersen discovery in hopes of penetrating a porosity thickness which will prove producable and economic.

And there is risk in drilling any well regardless of whether it's a direct offset to a good producer or a step-out five or six miles away and it's within the same formation.

And on top of that I discussed the generally poor potential in the two other objectives, the Drinkard formation and the Paddock formation, and therefore I would recommend a risk of no -- a risk penalty of no more than 100 percent.

Q Mr. O'Hare, will, in your opinion, the approval of TXO's application be in the interest of conservation, prevent waste, and protect correlative rights?

A Yes, I think so.

MR. VANDIVER: Mr. Examiner, I would move the admission of Exhibits Eight through Thirteen as evidence in this case, and --

MR. QUINTANA: Eight through Thirteen will be accepted into evidence.

MR. VANDIVER: -- I will pass the witness.

MR. KELLAHIN: Mr. Quintana, I'd like to take a moment, if I could, to review the geologic exhibits with my own geologist before I commence my cross examination.

MR. QUINTANA: We'll take a ten minute recess.

(Thereupon a recess was taken.)

MR. QUINTANA: The hearing will come to order.

Mr. Kellahin, it's your cross examine.

MR. KELLAHIN: Thank you, Mr. Quintana.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q Mr. O'Hare, I missed the benefit of having you tell us the -- your background and experience yesterday. Would you tell me when and where you received your degree in geology?

A I received my degree from the University of Kentucky, my Master's degree in geology.

Q And in what year was that, sir?

A 1982.

Q And how long have you been employed as a geologist with TXO?

A I've been employed with TXO for six months and then for another two years with Union Oil of California in Midland, working in Lea County.

Q Your Union Oil experience comes prior to your employment with TXO?

A Uh-huh.

Q In terms of studying the geology for a company that's doing exploration in Lea County, New Mexico, have you done any exploration geology in the Strawn in Lea County?

A I haven't done any regional studies, no.

Q When did you first first begin studying the specific Strawn pool that's under discussion today, the one that the Viersen Well discovered?

A I initiated an investigation into that area when I first came to work for TXO. We had drilled that TXO Carter Well up to the north, which was, as I previously described, a dry hole, and at that time we had another Grisso No. 1 proposed, and at that time that well was proposed by another geologist at TXO in that same northeast quarter, and so I did do a local geologic investigation of the Strawn based on the data from the TXO Carter file.

Q All right. If I look on Exhibit Number Ten, your Strawn Isopach --

A Uh-huh.

Q I see what appears to be the TXO Carter Well in Section 33 as the only well on that section on this exhibit that's shaded in the reddish pink color. Is that the one we're looking at? That's the Texaco Carter.

A The Texaco Carter.

Q The TXO Carter is the dry hole to the south.

A Right.

Q All right.

A Uh-huh.

Q Your studies of this area predate the completion of the Pennzoil Viersen No. 1 Well?

A Uh-huh.

Q And you said another TXO geologist had picked a location for the TXO Well.

A Uh-huh.

Q Somewhere in the northeast quarter of Section 4?

A Uh-huh.

Q Where was that location picked by the other geologist?

A That location, I believe, was 1980 from

the east and 660 from the north, and so it would be in the northwest quarter of the northeast quarter, and after drilling the TXO Carter No. 1, that wellw as proposed primarily as a Drinkard and Paddock objective, based on his geologic interpretation.

Q Was your geologic study used by TXO to pick the location for the Grisso No. 1 Well?

A Uh-huh.

Q You said in your direct examination, I believe when you were talking about Exhibit Number Ten, that you used all available geologic evidence from which to draw the Isopach.

A Uh-huh.

Q Is that true?

A Uh-huh.

Q All right, what was available to you, Mr. O'Hare, that you used to prepare this exhibit?

A Well logs and scout tickets.

Q When we look at that Shipp Strawn Pool where the Viersen Well is --

A Uh-huh.

Q -- did you have available to you the Pennzoil Viersen well log?

A Yeah.

Q When we look to the north of the Viersen

well, there's the Mesa Petroleum Hightower Well.

A Uh-huh.

Q That was not used as control for preparing this Isopach, was it, sir?

A No.

Q It's not deep enough, is it?

A No. It's on there, NDE, not deep enough.

Q In terms of constituting a new Strawn Pool, Mr. O'Hare, are you satisfied as a geologist that this Shipp Strawn Pool we're looking at is a separate Strawn reservoir from the Fasken reservoir to the south and west and the other Strawn wells up there in Section 34?

A Yes, I've got no problem with that.

Q When you look at the thickness of the Strawn porosity that's mapped on Exhibit Number Ten --

A Uh-huh.

Q -- is this an indication of the thickness of the Strawn lime section?

A No, it's not a gross Isopach.

Q When we talk about looking for these little Strawn pods, these little reservoirs, is the thickness and thinning of the Strawn lime significant to you as a geologist?

A No.

Q Why not?

A Regionally the Strawn thickens to the north and the east.

Q When we're looking for porosity development in the Strawn, are you going to as a geologist look at the entire Strawn interval or would you be looking at only the lime section in the Strawn?

A You look at the lime section at the base of the Strawn.

Q All right. Let's look at --

A Locally.

Q I'm sorry?

A Locally.

Q Yes, and that's what I'm interested in, in Section 4.

Let's look at your cross section for a minute, Mr. O'Hare.

A Uh-huh.

Q I've forgotten what that exhibit number is.

A Number Eleven.

Q All right. When we look at the cross section, the second well from the left, which would be the Read and Stevens Blackmar No. 1 Well, through that well you have drawn a line and labeled it "base of the Strawn". Correct?

A Uh-huh.

Q When we look at that well, will you describe for us what the lithology is in the Strawn at the point where you have drawn the base of the Strawn?

A It appears to be a shaley limestone.

Q A shaley limestone above or below the line that says "base of Strawn"?

A Below, just below. It appears to be possibly (not clearly understood) of lime in that shale.

Q Below the line that says "base of the Strawn" does the Strawn section turn to a sandy lithology?

A I don't know, I wasn't privy to any, you know, (inaudible).

Q As a geologist, then, how did you determine the base of the Strawn on each of the logs as you go across the cross section?

A Based on gamma ray and (inaudible).

Q And are you looking to determine for the base of the Strawn where you find the deepest end of the Strawn lime?

A Will you repeat that?

Q Yes, sir. Do you attempt to correlate the base of the Strawn as you've identified it on the cross section with where you pick the base of the Strawn lime as opposed to the Strawn sand?

A I don't know if that has any relevance.

Q All right, how did you determine then in order to find the Strawn porosity, would you not have concentrated on trying to pick and determine where you would find the Strawn lime?

A Will you repeat that? I'm not sure I understand your direction?

Q All right. When we're looking for the Strawn porosity pods --

A Uh-huh.

Q -- is it important to you as a geologist to carefully pick and locate the lime section in the Strawn formation?

A The porosity is developed in this lime section.

Q All right, now we're talking about the same thing.

A And the thickness of the lime section is inconsequential.

Q All right.

A The only pertinent (not understood) is the thickness of the porosity developed in that lime section.

Q Can we correlate the thickness of the lime section with the general porosity to be found in that

section?

A No, because the porosity has been developed in different parts within that lime section and different areas.

Q We're getting to the same place, I think. What we're looking for is the gross interval over which then you would examine to see what the porosity was. Correct?

A Uh-huh.

Q The gross interval you're looking at, then, is going to be one limited by the Strawn lime as you find it.

A Uh-huh.

Q Right? You're going to include in that examination that Strawn interval that has got sand in it.

A Personally I would not include any of the interval between that and the (not clearly understood.)

Q All right. As we go across, then to the log number two, in your opinion does that approximate --

A The Blackmar?

Q Yes, sir, does that approximate what would be the base of the Strawn lime?

A Yes, I think so.

Q All right, from the top of the Strawn to the base of the Strawn we've now identified the Strawn lime interval.

A Uh-huh.

Q It will be within that interval, then, we will look for porosity development.

A Uh-huh.

Q All right. Let's go to the third log over. Would you identify for me whether that base of the Strawn line that's struck through that log correlates and represents your opinion as to the base of the lime section in the Strawn?

A Yes, I feel that that (not clearly understood.)

Q All right, and again, then, as we get to the fourth well, are you intending to represent by the base of the Strawn what we find, or what you have concluded ot be the base of the lime section in the Strawn?

A As best as I can interpret.

Q All right.

A I was -- I was hedging between that pick and a pick slightly above that, but I think that's probably inconsequential.

Q All right, let me, just for the sake of clarity, sir, have you mark with my red pen where the two -- where the other alternative choice would be for the base of the lime section on that fourth log over.

A I'd say it could probably be in here,

this rather heavy line right there.

Q All right. Other than that choice, are there any other choices on any of the logs that you as a geologist might conclude would be the base of the lime?

A I feel pretty confident with (not clearly understood.)

Q When we get to the last well on the far right you're comfortable with the TXO Production, the Carter F No. 1 Well?

A As best as I can be. The gamma ray quite above the point which I actually really truly had picked, so I really should have in fact had that dashed. (Not clearly understood.)

Q Thank you, sir. When you as a geologist are trying to locate one of these little Strawn reservoirs, one of these pods, is it significant to you to try to find and correlate the Strawn lime section so that you can see whether it thickens or thins as you move across your cross section?

A For my best estimate, the thickness of the shale interval between the base of the Strawn and the top of the Mississippian lime does not indicate either a thickening or thinning of the Strawn lime section, and therefore, regional geologic mapping to discover thess types of porosity pods is moot at best.

It is a geophysical prospect.

Q You said that there was within this specific area some general trends to the Strawn reservoirs that we found.

A Uh-huh.

Q I believe you told us that they tended to be linear. They tended to be elliptical in shape, and that they were -- tended to be oriented northeast to southwest.

A Yes, in the area depicted.

Q You've described for us your opinion of the risk factor involved in the drilling of the TXO Grisso well location. I believe you've reached the conclusion that that location justified the maximum percentage penalty under the rules of the 200 percent. Was that your conclusion?

A No, that wasn't.

Q With regards to the potential for a Strawn well, had you concluded that the TXO location merited the 200 percent penalty?

A No.

Q You did not?

A No.

Q Have you made a recommendation to the Examiner as to what the risk factor penalty ought to be in the event TXO is awarded operations and their location is approved?

A Yes.

Q And what is that number?

A 100 percent.

Q All right, for all formations?

A Yes.

Q All right. In your opinion will the proposed location that TXO has suggested be one that can justify itself in the Drinkard formation alone?

A No, I don't think so.

Q And how about the Paddock formation by itself?

A No way.

Q Do you know, Mr. O'Hare, whether or not TXO is going to await the outcome of Pennzoil's drilling and completion of its Shipp No. 1 Well in the west half of the northeast quarter prior to undertaking the drilling of the Grisso well should TXO be awarded the operations of that well?

A No opinion on that.

Q As a geologist would you make a recommendation to your management to await the outcome of the drilling of the Pennzoil well prior to commencing of the Grisso well?

A I feel that the Grisso location involves less risk and I would therefore recommend that before the

Shipp No. 1.

Q As a geologist, Mr. O'Hare, I think I've asked you before but I can't remember exactly, do you have any disagreement as a geologist with Pennzoil's request to space this new reservoir on 80-acre spacing?

A No, I don't.

MR. KELLAHIN: Nothing further, thank you.

CROSS EXAMINATION

BY MR. QUINTANA:

Q This is a copy of Exhibit Number Eight.

A Uh-huh.

Q Would you show me where Pennzoil's proposed well is going to be, the one -- the one that Mr. Kellahin just mentioned, and state the location?

A It's going to be 1980/1980.

Q Okay, 1980 --

A From the north and east.

Q 1980 from the north and 1980 from the east?

A Uh-huh.

Q Section 4.

A Uh-huh. Just probably over the "L" or something (not clearly understood.).

MR. QUINTANA: I have no questions of the witness. Does someone else have questions of the witness?

MR. BATEMAN: No questions.

REDIRECT EXAMINATION

BY MR. VANDIVER:

Q Mr. O'Hare, based upon all existing geological data in this area, do you have an opinion as to the best, optimum location for drilling in this field?

A I feel that our offsetting location directly to the north, which is being proposed for the Grisso No. 1 would help to further define the reservoir limit directly to the north and therefore would be the best location of least risk.

MR. VANDIVER: That's all I have, Mr. Examiner.

MR. QUINTANA: Mr. Kellahin?

MR. KELLAHIN: Nothing further.

MR. QUINTANA: Any further questions of the witness?

I have no questions. The witness may be excused.

MR. VANDIVER: Mr. Examiner, that's all the evidence I wish to present at this time. I

may wish to call rebuttal witnesses following Pennzoil's case and I will have some comments as to what I think the Division should do in this case at the close of the case.

MR. QUINTANA: Fine. Mr. Kellahin, it's your show.

MR. KELLAHIN: Call as our first witness, Mr. Quintana, Mr. Greg Davis.

I apologize for being a little short of some of these land documents, land title documents. I'll make additional copies for anyone who desires them after the hearing.

If you'll bear with me, we'll try to do what we can with what we have.

MR. QUINTANA: Okay. You may proceed.

GREG DAVIS,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Davis, would you please state your name and occupation?

A My name is Gred Davis. I'm a petroleum

landman with Pennzoil Company.

Q Mr. Davis, as a petroleum landman have you previously testified before the Oil Conservation Division?

A Yes, I have.

Q Will you describe for Mr. Quintana when and where you obtained your degree?

A I obtained a degree in petroleum land management from the University of Texas in the fall of 1981 and I have since that time been employed as a landman with Pennzoil Company.

Q As a landman for your company have you made a study of the land ownership, the working interst owners involved in the northeast quarter of Section 1 --

A Yes.

Q -- Township 16 South, 37 East?

A Yes, sir.

Q All right. I have marked, Mr. Davis, as Pennzoil's Exhibits One through Sixteen a package of documents and correspondence.

Have you had an opportunity to review that package of information?

A Yes, I have.

Q And are those documents true and correct copies of documents taken from Pennzoil's file?

A Yes, sir, it is.

Q And is correspondence reflected in that file, correspondence that has either been generated by you or received on behalf of your company by you?

A Yes.

Q Are you familiar with the operating agreements that are enclosed in that package of exhibits?

A Yes, sir.

Q And did you prepare the working interest tabulation that's shown on Exhibit Number One?

A Yes, I did.

MR. KELLAHIN: We tender Mr. Davis as an expert petroleum landman and move for the introduction of Exhibits One through Sixteen.

MR. QUINTANA: Mr. Davis is considered an expert landman.

Mr. Kellahin, you plan to go through each and every one of these, right?

MR. KELLAHIN: I hope not to, sir. We will avoid Mr. Aycock's approach to testimony and we will try to summarize only those documents that will be helpful in presenting our position.

MR. QUINTANA: Fine. We will enter Exhibits One through Sixteen, entered as evidence.

You may proceed.

Q Mr. Davis, let me orient you, sir, to the unit we're looking at when we look at the northeast quarter of Section 4 and we're looking at the working interests that are entitled to participate in Strawn production.

Have you made a tabulation of what that percentage working interest will be for the whole 160 acres?

A Yes.

Q Is that shown on Exhibit Number One?

A Yes, sir, it is.

Q When did you first commence, Mr. Davis, efforts on behalf of Pennzoil to reach voluntary agreement, farmouts, joinder, assignments, acquire leases, whatever, for the drilling of Pennzoil's B. E. Shipp No. 1 for the west half of the northeast quarter and the B. E. Shipp No. 2 for the east half of the northeast quarter?

Describe for us your first efforts.

A Our first efforts were in April of 1985. We, of course, we had a prospect and we were in the process of preparing to drill our Viersen No. 1 Well in the southeast quarter, and sent out letters asking for support towards drilling of that well, asking for option farmout agreements on the northeast quarter.

And we did obtain two option farmouts from Amerind Oil Company and David Fasken Estate.

Q Directing your attention to Exhibit Num-

ber Two, which is a letter dated April 8th, 1985, is this approximately when Pennzoil commenced its efforts to form a voluntary unit for two wells in the northeast quarter of Section 4?

A Yes.

Q Would you describe generally for the Examiner what it is that you did, in chronological order, in order to form a voluntary unit?

A Well, of course the first effort that we had was in April asking for support and option farmout.

Then, upon the completion of our Viersen Well in August, it was completed, I believe, August 16th, 1985, as a -- as a commercial producer, we, you know, evaluated all the data that we had and on August 23rd we received a proposal from TXO to drill their Grisso No. 1 and upon review we -- I called back Mr. Bourgeois and informed him that we had a location that we also wanted to drill in the east half northeast quarter that was different from their location and on August 30th I sent out our well proposal for the number -- B. E. Shipp State No. 1 and No. 2 Wells, along with our proposed Authortization for Expenditure.

And since our -- since we sent out our proposals we have received commitments from working interest owners and unleased mineral owners to join us in both of our wells.

Q All right, sir, let's use Exhibit Number One to summarize what you've done as a landman with regards to the two units involved in the northeast quarter.

First of all, sir, since April 8th of '85 have you contacted each and every one of the working interest owners that are involved in the northeast quarter?

A I have.

Q As of today when we look at the tabulation -- well, first of all, let's talk about the percentages.

You have listed on the left margin of the tabulation what, sir, under ownership?

A That's the undivided interest owned by the working interest owners and unleased mineral owners in the northeast quarter.

Q And when we look at percentage interest what are we looking at, the second column over from the left?

A Right, okay.

Q That's the percentage?

A Right, yes.

Q And the ownership is the individuals?

A Yes, sir.

Q All right, when we look to the last two columns what are we looking at?

A We're looking at the percentages that -- of the parties that have committed by either signing an AFE and both -- and an operating agreement, or just signing an AFE towards the drilling of our two wells in the west half northeast and the east half northeast.

The asterisk indicates the companies that have signed our AFE but not signed our operating agreement.

All other parties have signed our operating agreement and AFE.

Q When we look at the column for the east half of the northeast quarter, that proration unit that we're discussing this morning, what is the total percentage interest, in your opinion, that are currently committed to Pennzoil?

A 48.52 percent, approximately, rounded.

Q When we look at TXO's interest, the third one from the top --

A Uh-huh.

Q -- they've committed to join the well in the west half but not the east half.

A That's correct.

Q All right. Mr. Bourgeois testified this morning about various companies.

Have you had contacts with Mr. VanZant, as he has?

A Yes, sir, I have.

Q Would you describe for us what the state is of your communication and correspondence with Mr. VanZant?

A When he received our proposal he had told me that he'd also received TXO's proposal and that he was going to go ahead and sign an AFE subject to the acceptance of an operating agreement, and that he was going to do the same thing for our well, he signed it, you know, subject to acceptance of an operating agreement.

So we sent him an operating agreement. He signed our operating agreement so we feel he is committed to drill our well.

Q Are there any other interests in the tabulation here, Mr. Davis, that Mr. Bourgeois testified to this morning that is different from the information available to you?

A Yes. He -- he mentioned in his testimony that the Texaco has a 16 percent working interest under the unit agreement and that they had committed that interest to the drilling of their well.

Well, the record title shows they only own as between Shell, Atlantic Richfield, and Texaco, only 9.3125 percent.

And the record title and the contractual

title there's going to be different. We don't have, we're not privy to that information, and from what I understand there are some other companies still involved that we have no idea who they are.

It's just, you know, they have an interest subject to an operating agreement.

Q When we look at your tabulation, Mr. Davis, are there any other owners that have not been shown as joining Pennzoil that support Pennzoil's location in the east half of the northeast quarter?

A Yes, sir, there is. The Superior Oil Company, in our evidence we have a letter signed by them supporting our location, and we also received, I believe, the same letter that TXO received from SOHIO supporting our location subject to being appointed by the Commission as the operator.

Q All right, so SOHIO's cut both directions.

A Yes, I believe it's the same exact letter.

Q All right. Would you simply direct the Examiner's attention to the estimated expenditure of well costs for this subject well so that he'll have it available before him?

A Yes. For the -- for the B. E. Shipp Es-

tate No. 2 dry hole costs are estimated at approximately $457,000 and completed costs at $707,000.

The difference between our No. 1 and No. 2 Well is due to we would use the same production facilities on the No. 1 for the No. 2, so we wouldn't have to have production facilities, hopefully, anyway.

Q Your estimate of expenditures for the No. 2 Well, then, are based upon the Viersen No. 1?

A Correct.

Q Do you know, Mr. Davis, how many Strawn wells that Pennzoil operates in this area?

A In this immediate area, of course, we operate the Viersen No. 1 Well and to the north in Section 20 and 21 and 17 and 18 of 16, Township 16 South, Range 37 East, we operate approximately six wells.

Q Have you circulated to the working interest owners a proposed operating agreement?

A Yes, sir, I have.

Q Would you identify for us the operating agreement? I believe it's the first one contained in the package of exhibits, dated September 10th, 1985?

A That's correct.

Q In that operating agreement, Mr. Davis, what do you propose on behalf of Pennzoil be charged for overhead rates?

A $5500 for drilling wells and $550 for producing wells.

Q Based upon your experience are those rates that are reasonable and comparable to those charged by other operators for wells of this type?

A Yes, sir.

Q What are the overhead charges being used for the Viersen No. 1 Well?

A These same overhead rates.

Q And have you had working interest owners execute your operating agreement for the east half of the northeast quarter?

A Yes, sir.

Q In terms of the development or drilling of the wells for the west half of the northeast, the Shipp No. 1, and for the east half, the Shipp No. 2, do you know what your company plans to do in terms of the order or the progression they will take for the drilling of those wells?

A Yes, sir, we plan to -- right now we plan to drill the B. E. Shipp Estate No. 1 Well first and upon review of the data that we -- and the results of that test, commence the No. 2 Well.

Q In the event you're successful and the Division approves Pennzoil as operator of the east half of the northeast quarter, do you propose a provision or a tim-

ing so that the working interest owners in the east half of the northeast quarter prior to making an election as to whether to go consent or nonconsent, they will have made available to them the information from the drilling of the Shipp No. 1 Well?

A Yes.

Q You'll do that?

A Yes, sir.

MR. KELLAHIN: That concludes my examination of Mr. Davis.

MR. QUINTANA: Cross examine?

CROSS EXAMINATION

BY MR. VANDIVER:

Q Mr. Davis, prior to drilling your Viersen No. 1 Well, what interest did Pennzoil own in the northeast quarter of Section 4?

A This 36.86 percent. That includes farm-out agreements that we have taken.

Without our farmouts we own approximately 16 percent.

Q And these were option farmout agreements?

A Yes, sir.

Q And so by drilling that well you earned additional interest in the northeast quarter?

A We earned the option to earn that interest by drilling and completing wells in the northeast quarter.

Q When you testified that the Viersen No. 1 was completed August 16th of 1985?

A Yes, sir.

Q When was that completion reported?

A Well, that's the -- I believe that's the date that was used on our completion report filed with the Commission August 16th.

Q When was that completion report filed?

A I do not have that information.

Q You testified that TXO proposed their Grisso No. 1 Well to you on what date?

A I believe it was Augsut 23rd.

Q You've also testified that J. H. VanZant and SOHIO have signed both yours and Pennzoil's AFE's, is that correct?

A SOHIO has not signed anything. They just sent us a letter that stated that if we are appointed operator in both forced pooling hearings that they will participate and support our locations.

Mr. VanZant signed both AFE's, TXO's AFE for the Grisso and Pennzoil's AFE for the B. E. Shipp State No. 1 and 2, both -- all three subject to acceptance of an

operating agreement, and the subsequently executed our operating agreement.

Q Mr. Davis, what is Pennzoil's leasehold interest in the southeast quarter of Section 4?

A I would say right now it's 90 -- approximately 94 percent, and probably within a month it's going to go down to approximately 86 percent, due to payout of a well, and our reduction of interest pursuant to the farmout agreements.

Q And that's the -- that's the tract upon which your Viersen No. 1 Well is located?

A Yes, sir.

Q What's the Viersen No. 1 Well producing right now?

A I believe it's producing -- it's shut in right now.

Q What allowable?

A I believe right now it's around 350 barrels a day. That's a temporary allowable.

Q And you testified that your interest in the southeast quarter will be reduced to 86 percent, and that's -- is that --

A That's just in the east half northeast quarter.

Q And that's upon payout of the Viersen No.

1 Well?

A Yes, sir.

Q When do you expect it will pay out?

A I would probably say within the next month or two.

Q You're familiar with the mineral ownership in the southeast quarter and the northeast quarter of Section 4, is that correct?

A That's correct.

Q And are there any common owners? Is there -- are there any mineral owners that own mineral interests in the southeast quarter that also own mineral interests in the northeast quarter?

A No, sir.

Q Are there any leasehold owners that own working interest in the southeast quarter and also own working interest in the northeast quarter?

A Yes.

Q Who are those?

A Pennzoil Company and The Superior Oil Company.

Q And you testified that The Superior Oil Company supports your location.

A Yes, sir.

Q What interest does Superior own in the

southeast quarter?

A They own 7 percent -- 6 percent, the balance right now and then after payout it will drop to about 4 percent.

Q Are there other working interest owners who, I assume, will have the right to back in for working interest after payout in the southeast quarter, who also own working interest in the northeast quarter?

A No, sir.

Q So it's just Pennzoil and Superior, are the only ones that own working interest in the entire east half of Section 4?

A Yes, sir.

Q In your communications with the other working interest owners in the northeast quarter, are there other parties who have indicated that they're awaiting the outcome of this hearing?

A Yes, sir.

Q Who are those?

A All parties with the exception of the ones that have committed to, you know, participate in our wells.

All parties that you see not listed on my breakdown.

Q Are there any that have indicated to you

that they will not consent or go nonconsent regardless of the outcome of this hearing?

A All parties that I have spoken with that haven't made a decision have indicated to me that they're going to participate, regardless.

Q If TXO's application is approved in this case is Pennzoil going to go nonconsent?

A I could not -- I can't answer that.

Q Your -- your testimony is that the drilling costs for your proposed well, which is the Shipp No. 2, is $707,000?

A Yes.

Q And what's your drilling cost of your Shipp No. 1 Well?

A Completed cost is $700 -- approximately $771,000.

Q And your -- your overhead, proposed overhead charges are just slightly more than TXO's proposed charges, is that correct?

A That's correct.

Q What is the reason that Pennzoil proposes to drill its Shipp No. 1 Well in the west half northeast quarter first?

A The main reason is because we have a separate buildup in the northeast quarter from the souteast

quarter. We feel there's two separate biohermal porosity build-ups, and we would like to test -- we feel that our No. 1 location will, you know, be our best test to either confirm that or disconfirm it.

Q What is the distance of your proposed Shipp No. 2 Well from Pennzoil's Viersen No. 1 Well in the east half southeast quarter?

A Oh, it is -- I'll have to add this up. I'll have to do some figuring on it. I really don't -- I've never -- let's see, what have we got here?

Q First of all, the footage of your Shipp No. 2 Well is what?

A Okay, it's 660 from the north and 810 from the east, so I'd say it's approximately 2640.

Q Approximately within half a mile.

A Yes.

MR. VANDIVER: Excuse me, just a moment, Mr. Examiner.

I'll pass the witness, Mr. Examiner.

CROSS EXAMINATION

BY MR. QUINTANA:

Q I have some questions for you, Mr. Davis.

A Yes, sir.

Q To your knowledge, do you know if TXO participates in the production from the Viersen No. 1?

A Do they participate in production, TXO? No, sir.

Q Correct me if I'm wrong, TXO signed an AFE to the drilling of the Shipp No. 1 in the west half of the northeast?

A Yes, sir, subject to acceptance of our operating agreement.

MR. QUINTANA: No further questions.

MR. MAX COLL: Mr. Quintana.

MR. QUINTANA: Would you state your name for the record?

MR. COLL: Mr. Quintana, my name is Max Coll. I'm here representing myself and my brothers. We're listed as unleased mineral owners on Exhibit One, and I'd like to ask a question about the proposed order of drilling these wells.

I believe you testified that you would first drill the Shipp No. 1 and then the Shipp No. 2, is that correct?

A To the best of my knowledge that's what we plan to do.

MR. COLL: Okay. Now you're

also proposing a well in the west half of the southeast, the Viersen No. 2, is that the correct name of it?

A Yes, sir.

MR. COLL: Okay, where does that fit in the order of the proposed drilling of the wells?

A We plan to drill that well as soon as we get an order on our field rules.

MR. COLL: So it would be the Viersen No. 2, the Shipp No. 1, and then the Shipp No. 2, in that approximate order, is that correct?

A Well, yes, sir, but I don't really see what the Viersen No. 2 has to do with the drilling of these wells?

MR. KELLAHIN: He just wants to know the order of drilling.

A Oh, I believe that's what it is.

MR. COLL: I want to know the order and I want to know the delay in the anticipated completion of a well in the --

A Okay.

MR. COLL: -- east half of -- in the east half of the northeast. That's the reason for this series of questions.

A Yes, sir. Okay.

MR. KELLAHIN: Mr. Coll, if

this witness doesn't satisfy you, I have another witness that can specifically tell you.

MR. COLL: All right. I just want to make sure. That's the approximate order that you propose to drill them, though, the Viersen 2, the Shipp 1, the Shipp 2.

A Yes, sir.

MR. COLL: Thank you.

MR. BATEMAN: One quick question, if I may, on Exhibit Number One with respect to Texaco's interest again.

CROSS EXAMINATION

BY MR. BATEMAN:

Q You testified, I think, with respect to the combined interest of the East Lovington Unit.

A Yes. Yes, sir. Well, the Shell-ARCO-Texaco interest.

Q Right, and that's -- what was that figure?

A Let me see. Well, I believe it's 9.3125 percent.

Q How is that reflected on Exhibit One, if it is?

A Okay, well, Shell Western, this is record

title as taken from a drilling opinion prepared by Doug Lunsford of Hinkle Law Firm in Roswell.

Shell Western with 8.039 percent working interest.

Atlantic Richfield with .5773.

And Texaco Producing with .6962.

I had it written down on one of my -- I think you might have got it, or somebody.

Q I just wanted to clarify that.

A Yes.

Q Thank you very much.

MR. QUINTANA: Any further questions of the witness?

MR. VANDIVER: Yes, sir, Mr. Examiner.

RECROSS EXAMINATION

BY MR. VANDIVER:

Q If I could ask just a few more questions, Mr. Davis.

A Yes, sir.

Q Your Viersen No. 2 will be located in the west half southeast quarter of Section 4?

A Yes, sir.

Q And that's at an unorthodox location?

A Well, if we're successful with our field rules, it will be an orthodox location, but if we do not get our field rules it will be unorthodox.

Q What is the location of that proposed well?

A Oh, let's see, I don't -- I don't have that information with me. I believe it's 3810 from the north and south.

(There followed a discussion off the record.)

A Well, that's probably right. I just -- I might --

MR. QUINTANA: We'll take a two minute recess for him to get that information.

(Thereupon a recess was taken.)

MR. QUINTANA: Did you find it?

A Yes, sir.

MR. QUINTANA: You may proceed.

Q Mr. Davis, I believe my last question was what is the footage location of the proposed Viersen No. 2 Well?

A It's located 1300 feet from the south line and 1650 feet from the east line.

Q What is the distance of the Viersen No. 2 Well from the Viersen No. 1 Well?

A Again, I'd say it's about a quarter of a mile.

Q Approximately 1320 feet? 1300 feet?

A Yes, sir.

MR. QUINTANA: What was that distance? What was that location again?

A It's 1300 from the south and 1650 from the east.

MR. QUINTANA: Thank you.

Q Mr. Davis, did -- prior to drilling Pennzoil's Viersen No. 1 Well, did Pennzoil request a farmout from TXO Production Corporation as to the acreage in the -- as to their interest in the northeast quarter --

A Yes, sir.

Q -- of the section? And what was their response?

A They turned us down.

Q And what was their reason?

A Mr. Examiner, we'll look in the exhibits, I believe it's probably Exhibit Four, letter from TXO to Pennzoil, dated June 19th, 1985. They just turned us down with no reason why they turned us down.

Q Mr. Davis, do I understand that you will earn interest in the northeast quarter by drilling your proposed Shipp No. 2 Well?

A Yes, sir.

Q Will you earn interest if -- if your -- if someone else drills the well in the northeast quarter?

A I believe our farmout agreement doesn't mention that, but I believe that we probably could if we participated. As long as we participated in the well we'd earn still.

Q With respect to your Viersen No. 2 Well, what's the -- I believe in your earlier case you were asking in the alternative for a nonstandard location, or an unorthodox location in the event the special pool rules were not approved by the Division.

A Yes, sir.

Q What was the purpose of the nonstandard location?

A To locate our well at the most optimum location on the -- we feel, in the pool.

MR. VANDIVER: Pass the witness, Mr. Examiner.

MR. QUINTANA: Any questions of the witness?

He may be excused.

MR. KELLAHIN: Mr. Examiner, we'll call at this time Mr. Ralph Williams.

RALPH A. WILLIAMS,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A My name is Ralph A. Williams. I'm a petroleum engineer for Pennzoil Company in Midland, Texas.

Q Mr. Williams, have you previously testified before the Division as a petroleum engineer?

A Yes, I have.

Q Did you testify on behalf of your company as a petroleum engineer before the Division on September 11th, 1985, in Case 8690?

A Yes, I did.

Q Subsequent to that testimony, Mr. Davis, have you made additional engineering computations and calculations?

A Yes, I have.

Q And are those calculations with regard to the Viersen No. 1 Well?

A Yes, they are.

Q Have you reduced your study and information to the form of certain exhibits, Mr. Davis -- or Mr. Williams?

A Yes, I have.

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

MR. QUINTANA: He's considered an expert petroleum engineer.

You may proceed.

Q I'd like you to, before we start about your exhibits, have you give us a little background in terms of the engineering information that you have studied and evaluated from the Viersen No. 1 Well, the discovery well.

First of all, would you generally summarize for us, Mr. Williams, what you concluded back in September of this year with regards to the ability of the Viersen No. 1 Well to drain certain acreage. What did you conclude about the permeability of that well?

A We concluded at that time, and it's been reconfirmed by later testing, that the permeability is in the range of approximately 43 millidarcies. This is substantiated by core information on several feet of core that we did recover on the Viersen No. 1.

Q The determination that the Viersen No. 1 Well had 43 millidarcies of permeability in it led you to

what conclusion as a petroleum engineer in terms of its ability to drain certain distances?

A Under the radial flow equation it was concluded and calculated that a well exhibiting oil parameters and formation parameters would have an effective drainage radius of 9090 feet.

Q Subsequent to that testimony, Mr. Williams, have you received additional data and have you made other calculations from which you can determine whether or not there's a barrier from the wellbore of the Viersen No. 1 Well in some direction, some specific distance?

A Yes, I have further confirmed the possibility of a barrier at a distance of approximately 557 feet.

Q Would you summarize for us, Mr. Williams, what process you go through as an engineer to reach the conclusion that the producing well, the Viersen No. 1, has found a boundary to its reservoir at some location approximately 500 and -- what did you say -- 57 feet?

A It was 554 feet in the exhibit we will present.

Q All right. What process, summarize the process you go through as an engineer to make that determination.

A The process which has been used quite ex-

tensively, is the Hoerner -- Hoerner analysis. It's a plot of the pressure transient behavior of a well when it's shut in following a flow period.

This is -- the plot is made in dimensionless time to take the time factor in minutes or hours out of it.

It's a standard practice, which when looking at a Hoerner plot, once you've reached the -- once you've reached past wellbore storage effects, your pressure will increase on a -- at a constant rate, which is used to calculate the permeability.

During this time you're in radial flow and as your time increases you expand your radius of investigation out away from the wellbore in radial flow.

An anomaly or a change in slope of this Hoerner plot is indicative of several things: Either a thinning of the reservoir, a fault, a water contact, et cetera. All these are an in to the oil productive interval.

At that point your pressure transient is coming back into the wellbore in nonradial flow, and this accounts for the change in slope and the point at which this slope changes, using an equation that we will present here in a minute, you can calculate the approximate distance to this barrier, or end to the reservoir.

Q Have you applied standard engineering tech-

niques and methodology to make these calculations?

A Yes, I have.

Q Once that calculation is made and you have found a barrier, or some indication of a change in the reservoir at a certain distance, what then, or what purpose can be used with that type of information?

A It can be used in conjunction with geologic or geophysical data to project the extent of a reservoir.

Q Let's go through, then, sir, the exhibits you've prepared on that point and have you describe and identify your exhibits, commencing with Exhibit Number Seventeen, which is the Hoerner plot.

A Okay. This Hoerner plot includes several build-ups on the well, all the recorded build-ups on the well. We thought we'd put all the available pressure data on this to be less confusing to the Commission.

It is outlined in the plot, the black, which this originally was a color plot, but the very-most upper curve in the far upper righthand corner was the inital shut-in on the DST on the Viersen No. 1.

The next curve immediately under that, which extends down through approximately 2200, was the final shut-in on the Viersen No. 1.

These indicate that the pressure at the

time of drilling was approximately 2540 psi.

The one denoted as green is the intermediate curve in the middle, which was submitted as evidence in our case for field rules. It's the intermediate curve which extrapolates to approximately 2475.

And the curve which is denoted as blue is the bottom curve, which -- which extends -- which it's noted here that it's 330 hours since the company preparing this data for us plotted this. We have ran back in the well then an extended shut-in period and have retrieved several more points, the three points out away from the data, and we've projected that pressure to approximately 2390.

On this curve the boundary effects, which were first observed on the first build-up after the DST, were accentuated and it's my interpretation that the boundary effect was -- was seen at a time of approximately 32 hours, which translates to a Hoerner time of approximately 1.1.

Q What then did you do with this information?

A I used this data in the following exhibit, which I --

Q Eighteen.

A It will be Exhibit Eighteen. Let me reiterate the parameters going into this equation.

Thickness, H is equal to thickness is equal to 74 feet. That's our interpretation of the well log. As TXO's geologist testified 68 feet, so we're right in the same range.

A viscosity of .35 centipoise is from PVT analysis of similar oil in the Strawn.

Porosity of 12 percent from log calculation.

The oil compressibility of 14.61 times 10s to the minus 6 is from PVT analysis of similar oil.

Time is 1920 minutes is from the 32 hours at which the anomaly occurred.

Permeability is 43 millidarcies. It was calculated from the Hoerner analysis.

The distance to the anomaly is denoted by R-sub A.

Okay, and when we insert these into the equation, a standard equation to calculate the distance to anomaly, we come up with a value of 554 feet.

Q I have confused the record. You've just described Exhibit Nineteen.

A Oh.

Q That's all right, it's not your fault. I think everybody was looking at Exhibit Nineteen, anyway.

Exhibit Eighteen is the reservoir para-

meters and the drainage calculation. Would you go ahead and describe that for us now?

You don't have to read all the parameters, just tell us the conclusion.

A The conclusion from this, using a similar, similar parameters, was that the drainage radius of a well exhibiting these characteristics is 9090 feet.

Q All right. Would you describe for us the information on Exhibit Number Twenty, which the AFE for the B. E. Shipp State No. 1 Well?

A This information is an Authorization for Expenditure on Pennzoil's standard form, which was prepared by our Drilling Department, and the dry hole cost is estimated 900 -- excuse me, $456,900 and a completed well cost of $707,900.

Q And then Exhibit Number Twenty-two is the AFE for the Shipp Estate No. 2 Well.

A That's correct.

Q I'm sorry, if I misspoke, that's supposed to be Exhibit Number Twenty-one.

Mr. Williams, in your opinion are the AFE's, Exhibits Twenty and Twenty-one, fair and reasonable based upon your experience?

A Yes, they are.

Q Let's go on to Exhibit Number Twenty-two,

and we might as well look at Exhibit Number Twenty-three at the same time. Those are two plats, Mr. Williams, and I have marked for the record as Exhibit Number Twenty-two that plat that has the caption a the bottom that says "TXO Proposed Location".

I've marked as Exhibit Twenty-three that plat that says "Pennzoil Proposed Location."

Before we discuss the conclusions that you can draw as an engineer, let's orient everyone to what information is contained on the exhibit and simply identify, using Exhibit Number 22, the wells around which circles are drawn.

Starting in Section 4 let's identify the wells.

A The solid well symbol in the northeast quarter of the southeast quarter is the Viersen No. 1, which has been drilled.

The well to the southwest of that, an open circle, is the Viersen No. 2 proposed well.

The well in the southwest of the northeast quarter, denoted with a "1" with an open circle is the B. -- proposed B. E. Shipp No. 1.

The well in the southeast of the northeast quarter, also denoted as an open circle, if the TXO proposed well.

And the well in Section 3, which is in the southwest of the northwest, is the -- is a further planned well of Pennzoil's and we enter that as being the Waldron No. 1.

Q All right, let's go to Exhibit Number Twenty-three and have you identify the wells around which you've drawn circles.

A They are the same with the exception in the northeast of the northeast of 4 the well denoted as -- by an open circle with the number "2" is Pennzoil's proposed B. E. Shipp No. 2 and this -- this well has replaced TXO's location in the southeast of the northeast.

Is that enough?

Q Yes, sir. Around each of the wells on both exhibits you've drawn a circle. What does that circle represent?

A That circle is a graphical depiction of a radius of 1053 feet, which is the equivalent to an 80-acre unit of area. This is done to show it more in terms of a radial flow or that sort of connotation rather than the rectangular proration unit shape.

Q All right. You testified back in September; you've studied the Shipp Strawn Pool; you've looked at new engineering information, and done calculations, Mr. Williams.

Do you have any reservations as a petroleum engineer that this reservoir ought to be spaced and developed on 80-acre spacing?

A I have no reservations. I believe it should be developed on 80.

Q In terms of choosing a well location as opposed -- as presented by Pennzoil as opposed to TXO, what in your opinion as an engineer allows for the more efficient and orderly development of the reservoir? Which spacing location?

A The Exhibit Number Twenty-three, Pennzoil's proposed well locations.

Q What is your objection to the TXO location as they propose for the Grisso No. 1 Well in terms of the effects of drainage patterns on the wells in the pool?

A As you can see by the intersection of 80-acre radiuses, that you'll come into a conflict of drainage radiuses between the Viersen No. 1, the Shipp 1, the proposed Waldron No. 1, whereas, as depicted in 23, these do not intersect and they'll be a more effective way to produce the hydrocarbons from these -- from this reservoir.

Q Which well location pattern, Mr. Williams, maximizes the development of the reservoir and provides for the potential to develop the greatest portion of the reservoir?

A The Exhibit Twenty-three, the Pennzoil's proposed locations.

Q Were exhibits --

A I might --

Q Go ahead.

A I might add that as in any reservoir, you always have the potential for secondary recovery and based on this, as you all know, that on a secondary project if you have wells in close proximity to one another, that you'll quite likely have cycling of any type of fluid injected into the wellbores.

Q Based upon your study do you believe that this reservoir is a potential future candidate for those types of operations?

A Yes, it's a potential candidate. Pennzoil's also done work in similar reservoirs in the area and are in various stages of proposing secondary maintenance projects.

Q Were Exhibits Seventeen through Twenty-three prepared by you or compiled under your direction and supervision?

A Yes, they were.

MR. KELLAHIN: That concludes our examination of Mr. Williams.

We move the introduction of

Seventeen through Twenty-three.

MR. QUINTANA: Exhibits Seventeen through Twenty-two will be admitted as evidence.

MR. KELLAHIN: Twenty-three.

MR. QUINTANA: Excuse me, Seventeen through Twenty-three will be accepted as evidence.

MR. QUINTANA: Your cross examination.

MR. VANDIVER: Mr. Quintana, I hate to keep taking breaks but I'd like to discuss this for a few minutes with --

MR. QUINTANA: Will five minutes do? Okay?

MR. VANDIVER: Five will do, yes, sir.

MR. QUINTANA: Five minute recess.

(Thereupon a recess was taken.)

MR. QUINTANA: Mr. Vandiver?

MR. VANDIVER: Yes, sir.

CROSS EXAMINATION

BY MR. VANDIVER:

Q Mr. Williams, you testified that you believe there is a barrier, back on your Hoerner analysis, a porosity barrier?

A It could either be a porosity barrier, fa fault, a water contact, anything which disrupts the continuation of oil bearing porosity.

Q On the basis of the Hoerner analysis, is there any indication of which direction the barrier --

A There is not a direction that can be inferred from the Hoerner analysis.

Q So this barrier could be to the south of your Viersen No. 1 Well.

A That's correct. It could be in any direction.

Q Are there -- are there other possible explanations for the apparent barrier anomaly?

A There are -- that is the most likely and I'm not aware of any -- any other type of situations that would give you this sort of anomaly.

Q In connection with Exhibit -- Pennzoil's Exhibit Number Nineteen, I believe you testified that -- and the exhibit shows -- that you're using porosity of 12 percent?

A That's correct.

Q And that's the average porosity?

A That's the average porosity.

Q In your Viersen No. 1 Well?

A That's correct.

Q What's the basis of that -- that figure?

A Log analysis.

Q And did you analyze the log yourself?

A I analyzed logs and also you have to keep in mind that this is vugular porosity and this is my best estimate using the well log and my experience with similar bioherm developments of porosity.

Q And it's your testimony and belief that it shows that the barrier is approximately 554 feet from the wellbore of the Viersen No. 1 Well?

A That's correct.

Q And it's also your testimony that the drainage radius from the Viersen No. 1 is 9090 feet.

A That's correct.

Q Referring to your Exhibit Number Three, which indicates the proposed Pennzoil location, the circles represent 1053 feet, which is the radius of what, drainage on an 80-acre unit?

A That is the areal representation in a circular manner of an 80-acre proration unit, or an 80-acre

unit of area.

Q And this exhibit shows that your Viersen No. 1 is recovering oil from the east half of the northeast quarter of Section 4, is that correct?

A This -- this figure, Exhibit 23, has nothing to do with any reservoir drainage radiuses or anything. It's strictly a graphical description of an 80-acre area.

Q Well, what the -- what's the purpose of the exhibit, then?

A To graphically represent what a circular 80-acre unit of area would look like.

Q Well, in your opinion, based on your study of the area, is the Viersen No. 1 draining oil from the east half northeast quarter of Section 4?

A It's my opinion and backed up by the drainage radius calculation that those drainage radius calculations are a statement of the fact that if this permeability, this thickness is continuous, then that well will drain up to a radius of 9090 feet.

Q And you also, Pennzoil proposes what I think you referred to as the Waldron No. 1, is that correct?

A That's correct.

Q And what's the footage location of that well?

A That would be -- I'm not exactly sure. It's within 150 feet of the center of that quarter quarter and I'm not sure which direction will apply to that.

Q Do you anticipate that -- when do you anticipate drilling that well?

A We would anticipate drilling that well in mid to late November.

Q Does, to your knowledge, Pennzoil own any interest in the southwest quarter of Section 3?

A Yes, we do have acreage in the southwest quarter.

Q And you testified that Pennzoil's proposed location is the best location for the efficient and orderly development of the Shipp Pool, is that correct?

A That's correct.

Q And what's the basis of that opinion?

A The basis is a conglomeration of all data available, including geological and geophysical data which will be covered later.

Q Is this -- in connection with Pennzoil's Exhibits Eighteen and Nineteen, what was the basis of the oil viscosity used in those two exhibits?

A The basis of that is PVT analysis of a similar reservoir fluid. The reason for the difference of sure. We have different pressures on the two different ana-

lyses, which will slightly shift your viscosity.

MR. VANDIVER: I'll pass the witness, Mr. Quintana.

MR. QUINTANA: Is it your statement that -- I'm looking now at Exhibit Ten of TXO's exhibits -- is it your testimony that you're in disagreement with the Isopach map (not understood)?

A Mr. Examiner, I cannot, from the engineering data, really postulate any type of orientation or et cetera of the reservoir.

MR. QUINTANA: Fine.

MR. KELLAHIN: We have a geologist who will make that analysis for you.

MR. QUINTANA: No questions.

Any further questions of the witness?

He may be excused.

GREGORY L. HAIR,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Hair, would you please state your

name and occupation?

A My name is Gregory L. Hair. I'm District Geologist for Pennzoil Company in Midland, Texas.

Q Mr. Hair, would you describe for the Examiner what professional degrees that you hold?

A Yes. I hold a Bachelor of Science in geology from Illinois State Univerity; Master of Science in geology and geophysics from the University of Texas at El Paso.

Q Would you describe for us, Mr. Hair, what has been your work experience in the area of exploration geology with regards, particularly, to the Strawn formations, Lea County, New Mexico, and your familiarity with seismic evaluation of data?

A I joined Pennzoil in 1976 in Houston and I was transferred to Midland about two and a half years later.

My first assignment was working on the Strawn and I've worked on it continuously ever since for the past six and one-half years in this immediate area, in the Lovington area.

I've had training in geophysics besides at the university with -- with Pennzoil, over 120 hours, and I've interpreted geophysics in the Gulf of Mexico, Lea County, Eddy County, several other places in New Mexico, as well

as other basins that we have.

Q Have you participated in geologic evaluations and making, in addition, seismic interpretations of Strawn reservoirs here in Lea County, New Mexico?

A Yes. Six and a half years ago I started geologic evaluations and those have been continuous to the present.

Approximately two and a half years ago myself and others at Pennzoil started geophysical evaluations of this area.

Q Did you testify as an expert geologist before the Division on September 11th, 1985, in Case 8696, which was the spacing case for the new pool?

A Yes, I did.

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

MR. QUINTANA: He qualifications are accepted as an expert petroleum geologist.

You may proceed.

Q Mr. Hair, I'd like you to direct your attention first of all to what we have marked as Exhibit Number Twenty-four. I believe I've consistently marked what is your total Strawn porosity Isopach map. If that's not what we're all looking at, then we'll need to make a change.

All right.

A This is an Isopach map of porosity in the Strawn limestone. It's based on geological data where available and in the proposed Shipp Field area, geophysical data primarily with one data point from the Viersen.

Q Is this a map that is similar to the one that you used, prepared, and testified about at the hearing before the Division in September?

A Yes, it is.

Q Would you describe for us generally what you have depicted on the exhibit and then tell us what conclusions you reach from this exhibit?

A Okay. Generally, first of all, the three green arrows are shown on the exhibit, two of them our proposed locations.

The arrow on the southwest side is the B. E. Shipp No. 1 Estate proposed location. The arrow in the northeast of the northeast is the B. E. Shipp Estate No. 2, and the arrow in the southeast of the northeast is the TXO proposed location.

Q Would you describe for us what Pennzoil's order of development will be for the wells in this reservoir after the Viersen No. 1?

A Okay.

Q What's the sequence?

A Pending approval of a field rules, we plan to spud the Viersen No. 2 immediately. It is located in the southwest of the southeast.

Then while that well is still drilling, and pending getting all the -- everybody signed up in the No. 1 B. E. Shipp Estate, we plan to spud that well.

After the drilling of the B. E. Shipp Estate No. 1, we plan to move to the B. E. Shipp Estate No. 2 because we have planned to use the data from the No. 1 to determine the best -- the absolute best location and prove our location for the No. 2.

After that we plan to move another rig in and drill the well, the subsequent -- that's already been testified to, the Waldron No. 1 in the northwest quarter of Section 3 last.

Q Would you concur in TXO's geologist's opinion that the Grisso well location ought to be drilled regardless of the outcome of the Shipp No. 1 Well?

A No, I do not. Our geological interpretation says that that will be at best a marginal producer.

Q Would you describe for us how you have identified the Strawn reservoir in this area? What do you as a geologist look for when you're trying to find new oil discoveries such as this?

A It's been our experience in the area that

the thickness of the Strawn lime locally is extremely important. Whenever the Strawn lime thickens in the Lovington area porosity tends to develop along with that thickness and we look for local changes in thickness in the Strawn lime.

It is a fact that the Strawn does thicken generally to the northeast. It is a wedge-shaped deposit, but local thickness changes, thickening locally causes -- helps -- it occurs with porosity development.

Q Would you take a moment now, Mr. Hair, and go to TXO's exhibit, the cross section, which I think is Exhibit Number Eleven?

A Uh-huh, yes.

Q You were present in the hearing room when the TXO geologist described the structure map, Exhibit Number Eleven?

A Yes, the stratigraphic cross section.

Q I'm sorry, the stratigraphic cross section.

Would you examine the base of the Strawn that he has located on the cross section and give us your interpretation of where you would identify the base of the Strawn lime?

A We see a slight difference which becomes significant as you move down dip.

The base of the Strawn lime in the Tip-

perary John State is right here.

Q You've indicated that by drawing a red line on the exhibit?

A Red line across.

Q All right.

A Below that is a sandstone. We've examined mud logs showing that it is a sandstone.

The Pennzoil Viersen No. 1, the base of the Strawn lime is as Mr. O'Hare indicated for his alterante pick, not his original pick, and we also have sample data to indicate that.

The TXO Production Carter we do not have sample data. They apparently did not use it. I don't know.

We have picked the base of the Strawn lime here, based on correlations, extensive correlations through the area.

If that is used, the line which I'll indicate in red, shows the thickening between the top of the Strawn, base of the Strawn, between the Tipperary well and the Pennzoil well, and also the Pennzoil well is much thicker in the Strawn lime than the TXO well, if this is used as a base, as we believe it is, and it shows that this thickening is significant.

It also shows the other productive well, the David Fasken Well thickens considerably from the Read

and Stevens well, again a productive well thicker than a dry hole.

Q You've indicated to us that you have experienced and you do as a regular course of practicing your profession interpret and examine seismic information.

A That's true.

Q Would you turn now, sir, to Exhibit Number Twenty-five and identify for us with regards to this particular 160 acres -- well, in fact, it's more than that, it's most of Section 4 -- if you'll identify for us that exhibit and first of all describe what information you've depicted on that exhibit.

A This exhibit is strictly to serve as a location map. This is Section 4 outlined right there. It shows our geophysical coverage over Section 4. You can see that the lines are numerous running through Section 4 and we have highlighted two lines, Line 87, which is an east/west line, and Line 97, which is basically a north/south line.

There are two outlines on this map. We call them biohermal outlines. We believe that these are also algal bioherms, and based on seismic information, which I'll talk about in just a second, we propose these as the boundaries to these bioherms.

Three green arrows are shown again, the same as the green arrows on the other map, the B. E. Shipp

Estate No. 1, the B. E. Shipp Estate No. 2, and TXO's proposed location.

Okay. I'll go from here. I'd like to talk first about Seismic Line 87. Seismic Line 87 is an east/west seismic line; runs almost right down the middle of the section, and it's this seismic line right here. That is exhibit number --

Q Twenty-six.

A Exhibit Twenty-six, okay. On this overlay over the seismic line we have indicated an interval which we have shown to be the Strawn limestone in this area. It's indicated as the black line being the top of the Strawn and the lower black line being the base of the Strawn. The yellow interval in between is the Strawn limestone interval.

Q You've indicated that as an interpretation. Is that one that you have made based your experience?

A Yes, it's part of my interpretation.

That yellow line shows a thin interval of Strawn. Moving to the east it thickens. It thins again, thickens, then it thins again.

As you go along this section, you can see we show the bioherm located right here as a thickening. We go out of that bioherm into this zone, right here, which is thinning. Then we go back to the thickening again in this zone, and then out to a thin interval again.

The Pennzoil No. 1 Viersen is this well right here. It was drilled, if you project this in, you have to project along the strike of the interpreted bioherms, you can't just go straight north/south. It projects in about shot point 172, which lies right here.

Q Just a minute, let me get oriented.

A Right.

Q Using Exhibit Twenty-six, which is Shot Line 87, if I count over from 170 to the left two lines, I'm at 172, and that's the one you're --

A That is correct.

Q And we follow that all the way down until it intersects with the overlay that's shaded in yellow.

A That's correct.

Q And at that point what do we see?

A You see that that well was drilled into the thickened portion of this reflector, right in here, and as a result we found a thickened Strawn lime section. Velocity data which we got from the well indicated that we were 11 feet off on the Strawn. We predicted it to be 11 feet thicker than it actually came in, which is about -- a little less than a 5 percent error.

Q In terms of taking the seismic data, interpreting it, and then having it confirmed or disproved by actual drilling of the Viersen No. 1 Well into the Strawn

reservoir, would you describe for us what you have found?

A We have found that the Viersen again confirms within all reasonable probability of error, margin of error, that it confirmed this interpretation almost to the foot.

Something that you can also do to show this, lift up the overlay without the interpretation. It's still very clear, if you follow Shot Point 172 down, that you're in a thickened zone in the Strawn, right here, and you can see for yourself your thin, thick, thin, thick, thin; it's very easy to see.

Q Would you go now to Line 97 and show us your interpretation of that information?

A Line 97 is basically a north/south line; runs right through here, through the western end of the two bioherms that we've interpreted.

Again on the overlay the yellow is the same depiction, the Strawn interval. You can see a thin, thick, thin, thick, thin relationship again. That relationship again is marked where these black lines intersect the seismic line. Again, if you pick up the overlay you can see thin, thickens right there, thins back down, thickens back up, and thins again. It's very easy to see.

What this line serves to do, the reason we brought two, it helps lend credence to the orientation

that these things lie in there northeast/southwest. We believe also that that is the orientation of these bioherms.

When you take the cuts of the thickened section on the seismic line, it makes it very difficult to put those in there any way other than the way that they are drawn.

Now we have other data, obviously. We have this line, then we have this line, all these will support that. We have used that data also but it's not presented here.

Q As a geologist familiar and experienced with seismic interpretation of information, what is the process that you go through in exploring and developing a Strawn reservoir like this?

Do you start with the seismic data and then see how the drilling confirms or rejects the opinions you've made with the seismic information?

A Our areas of interest are based on regional geologic study. When geologic study is completed and we have identified areas of interest, we go in and shoot those seismic to see if that confirms our geologic interpretation; we drill and see if the subsequent data we obtain in the wellbore confirms the seismic, and in this case, in the Viersen No. 1 case it confirmed it almost perfectly.

Q In terms of regional geologic study, does

the seismic information that you have examined and interpreted, is that consisten with the regional geology you see in Strawn reservoirs like this?

A Yes, it is.

Q Is it consistent with Mr. O'Hare's interpretation for TXO that these porosity pods are elliptical in shape and they generally trend from northeast to southwest?

A Yes, generally that is true. There are places where the pods coalesce, are very close together, and it gives the indication that maybe they trend this way, but in reality individual pods still trend northeast/southwest.

Q When you've interpreted the seismic information and drawn your general outline of those two pods, Mr. Hair, what is the -- your degree of accuracy to which you are comfortable with regards to how those pods are oriented and their particular shapes?

A Subsequently to the drilling of the Viersen No. 1, which gave us precise velocity information, thickness information, which we could tie back into the seismic line, the degree of accuracy we feel right now is extremely high.

Q Would you identify for us what is depicted by the two pods shown on Exhibit Number Twenty-four -- I'm sorry, Twenty-five, in relation to the Isopach itself, Exhibit Twenty-four, and you might want to hold one of those

up there.

A This pod and this pod represent this one and this one. Those maps will not match exactly. This is a porosity Isopach. This is based strictly on where we see a thickening. There could be minor porosity out into the thin; it would be very minor. It could be that the porosity cuts off before you get to the edge. It's very erratic porosity; it's already been testified. That is a true statement.

But in general, that outline will lie somewhere between the zero and 20 foot contour on the Isopach. We try to be optimistic.

Q The line or shape of the pod on Exhibit Number 25, the one you're looking at now, represents which thickness on the porosity contours?

A It represents somewhere between zero and 20 feet. There is no definite contour line there that it represents.

Q Have you used Mr. Williams' engineering calculations with regards to the distance he has determined and calculated there to be some barrier, have you used that information to either confirm or reject any of the interpretations you've made about these Strawn reservoirs?

A The information, the 554 feet to a boundary, fits very well the Isopach, the porosity Isopach on

Exhibit Twenty-four.

554 feet is approximately the 20-foot contour line in either direction. We've, again we've said that you cannot demonstrate which direction the boundary is but it does not negate the geology. It helps confirm the geology that there could be a boundary there in that direction.

Q In terms of an opinion about the location that Pennzoil requests in the northeast quarter as opposed to the one that TXO suggests in the southeast quarter of this 80-acre tract, would you express to us your opinion as a geologist as to which is the preferable location?

A Based on the seismic data in particular, which we feel is more extensive than one wellbore, we feel that the Pennzoil location is a better location. You can see the TXO location is right on the edge of our thickening. I think it could make a well, a marginal well. We do not think it's in the optimum location.

You can see that the Pennzoil location is located as close to the center of the pod as we can get it. We think as narrow as these pods are, that's very critical to be close to the center.

Q Do you have any opinion as to whether or not the order of development with the eventual location of the wells as you've described is the one that is going to be

in the best interests of all parties involved in terms of giving them the optimum share of the reservoir underlying each of their individual tracts?

A Yes, we feel that because of our interpretation and the data that we made that interpretation from, the wells here will drain this reservoir very efficiently. We feel that by drilling the B. E. Shipp No. 2 after the B. E. Shipp No. 1 we will confirm the presence of a pod in this location. We will have data there. People can make an intelligent decision about whether to participate in this well or not, and it is the orderly fashion to develop the reservoir.

Q When we look at the Shipp No. 1 Well in the west half of the northeast quarter, do you anticipate a drainage area for that well that will cross over and extend into the south half of that section?

A Yes. As you can see here, this seismic line almost divided the section in half, just about like that, and you can see that if we drill the B. E. Shipp No. 1 it is going to drain part of the south half of that section.

Q I'd like you, sir, to take a moment and compare the Isopach map that you have placed on the wall with Mr. Williams' depiction of the radius circles that he's testified from.

Can you express an opinion for us as a

geologist with knowledge of the reservoir, which of the well location patterns proposed by either TXO or the one proposed by Pennzoil is the one that more effectively conforms to the reservoir as you believe it to be?

A Yes. As you can see, we believe the TXO location is on the edge of the pod with the boundary being just north of the location. This makes the effective drainage of the TXO well actually to the south and into the southeast quarter rather than draining the northeast quarter.

We feel like the Pennzoil location here conforms to the pod. It drains only the northeast quarter, not the southeast quarter, and is better situated to drain a wider area than the TXO well, TXO location.

Q Would you make your recommendation as a geologist to your management about a well location for this Strawn influenced by the information Mr. Hair has given us, Mr. O'Hare has given us for the Paddock and the Drinkard?

A We have not considered the Paddock and the Drinkard as commercial targets in this area, so we have no -- no indication (not clearly understood.)

Q In terms of risk factor, Mr. Hair, the Commission, as you know, has a statutory maximum for a penalty which it may apply to any nonconsenting working interest owners of 200 percent. In relation to that penalty

can you express an opinion as to the penalty that ought to be imposed to either location? Let's start with the TXO location and then have you go to the Pennzoil location.

A Based on our interpretation the TXO location certainly appears to be a risky well. It appears to be on the edge of the pod and seems to have considerable risk in the Strawn.

The Pennzoil location, while at the moment it appears to have significant risk because it's so far from the producing well, when fitted into our development plan lessens the risk considerably. We feel the risk is lessened significantly; however, we feel the risk in the area is inherent. There is a risk, as Mr. O'Hare testified, that one location away on a standard 80-acre proration you can encounter absolutely no porosity next to a well that had a tremendous amount of porosity.

So we feel that in any Strawn well in this area there is risk.

Q Let's look at Exhibit Number Twenty-four and perhaps have you give us an example of the close proximity to which wells can be drilled where we have one with good porosity, good production, and then an immediate offset that results in a dry hole.

A Yes, if you'll look in Section 34 of 16 South, 37 East, you'll see a number of wells there. There's

one in location A which has 60 feet of porosity; location B has 90 feet; location C, 105; location F, 32, and then -- I'm sorry location E, 32, and then location F, which is one standard proration away has absolutely zero porosity. It's a fairly good example of it.

There are other examples in Section 10 and 11 of 17 South, 37 East. This is the Humble City Field, and again you see wells with 103 feet of porosity offset one proration unit away with zero porosity, and again, this is fairly common in this area.

Q Does Pennzoil seek to be operator of the unit to be formed in the east half of the northeast quarter?

A Yes, we do.

Q Would you describe for us, Mr. Hair, what has been Pennzoil's operations in this immediate area? How many wells do you operate in the Strawn?

A We have significant operations in the Lovington Northeast Field. We drilled four wells in that field initially. We have since drilled another well in that field. We operate two other wells in the Northeast Lovington area. We participate in about, I believe, six more wells in the Northeast Lovington area.

We operate the No. 1 Viersen in the proposed Shipp Field.

We have extensive operations.

Q In looking at Exhibit Number Twenty-four, Mr. Hair, do you have any knowledge of the well in Section 33 that Mr. O'Hare placed on his cross section? That was the TXO dry hole in the Strawn. I think he attributed five feet on his Isopach to that well.

Were you involved in the geology in this area at the time that that well was being drilled?

A Yes, I was.

Q Had you for your own company or for yourself made any predictions about the success of that drilling effort prior to or while TXO was drilling that Strawwn well?

A When that location was staked we examined where it was to be drilled. We talked about it since we had significant interest in the area. We predicted it would probably be a dry hole.

Q Were Exhibits Twenty-four through Twenty-seven compiled under your direction and supervision or represent your own interpretation of the geologic information in the data?

A Yes, they do.

MR. KELLAHIN: We move the introduction of Exhibits Twenty-four through Twenty-seven.

MR. QUINTANA: Exhibits Twenty-four through Twenty-seven will be accepted as evidence.

MR KELLAHIN: That concludes my

examination of Mr. Hair.

MR. QUINTANA: Before we have cross examination, did you state the risk factor? I didn't hear a risk factor there.

A I don't believe we did.

MR. KELLAHIN: I apologize. I'd like to ask him a specific question on that.

Q In terms of a risk factor, Mr. Hair, you talked generally about the relationship of the two locations.

Do you have an opinion with regards to an actual percentage number to be applied in either case?

A Yes. I believe that because of the risk inherent in the area the statutory maximum of 200 percent is the best penalty to apply in this case.

Q And would that apply for all the well locations that are proposed in the northeast quarter of the section?

A Yes.

MR. QUINTANA: No. questions. Mr. Vandiver, you may proceed with cross examination.

MR. VANDIVER: Mr. Quintana, I propose, Mr. Quintana, that we break for lunch since it's noon and I don't think that if we go through the lunch hour that we will be through at 1:00 o'clock.

I'm going to put on three rebuttal witnesses.

MR. QUINTANA: Fine. We'll break for lunch and reconvene at 1:15.

(Thereupon the noon recess was taken.)

MR. QUINTANA: You may proceed.

MR. VANDIVER: Thank you.

CROSS EXAMINATION

BY MR. VANDIVER:

Q Mr. Hair, you have heard Mr. Williams' testimony previously this morning, is that correct?

A That is correct.

Q He testified that he could not testify as to any possible drainage by your Viersen No. 1 draining the east half northeast quarter?

A That's correct.

Q Why couldn't he testify to that?

A Because he did not prepare the geological exhibit that shows the (not clearly understood.)

Q Do you have an opinion as to whether or not the Viersen No. 1 will drain oil from the east half northeast quarter?

A I think from the Isopach that we've made it is fairly obvious that minor amounts of drainage will occur in the northeast quarter, yes.

Q What do you mean by minor amount?

A I think if we draw lines on there, which I had not done, reflecting the half section boundary, you will see there is not a significant -- according to our interpretation there is not a significant amount of porosity in the northeast quarter under TXO's location until you move into the other pod, the northern pod that we have in there.

Q And that's based upon your interpretation of your seismic data, is that correct?

A Absolutely.

Q You don't have a seismic line running through TXO's proposed location, do you?

A We do not have one with a shot point directly on TXO's location, no.

Q Where is the closest shot point?

A I'll have to get up and look at the map.

TXO's proposed location is right here. The closest shot point to me appears, well, I'm going to say 150 feet away; however, the projection of the TXO location along strike brings it down, oh, a little farther away.

Q And that shot point found an anomaly?

A At the shot point we projected TXO's lo-

cation into we thought it to be just on the very edge of the anomaly.

Q What -- what does the anomaly indicate?

A A thickening of the Strawn limestone.

Q And does that indicate increased porosity?

A All I can testify to is in the area of studies that I've made, where there's a thickening of Strawn lime there is porosity that occurs; it's not a one to one relationship.

In other words, if the thickness increases ten feet, that doesn't mean you'll have ten feet more or less porosity.

Q What's the method for converting the seismic data to porosity data?

A There is no way to convert to porosity data, only thickness data.

Q You found an anomaly along that, well, it's not a section line, but the line between the east half northeast quarter and the east half southeast quarter, is that correct?

A Here?

Q No, I'm talking about the shot point we're discussing.

A Right here?

Q Yes.

A It is on the very edge of the anomaly, yes.

Q How do you know that the porosity pinches out as you go north of that shot point?

A As I said in my previous testimony, porosity occurs where there's a thickening. These are thickenings.

I also stated that the porosity on our porosity Isopach did occur north in a very thin amount but this is not a -- has no relationship to porosity other than where the stuff thickens, where the lime thickens, there's a better chance to find porosity. Porosity in the thin zone would be either very thin or nonexistent.

Q But your porosity Isopach is based on your interpretation of your seismic data.

A No. It is based on my interpretation of the geology of the area plus the outline of the porosity units themselves are in an orientation which conforms to our interpretation of the seismic data, yes.

Q How do you know the porosity does not thicken as you go north of that shot point?

A We do not know. No one knows. We infer from the geology of the area that you have to have a thickened limestone section to have porosity. We infer from our

interpretation based on seismic data, which fairly well crisscrosses this area that that does not thicken in that direction, it thins, as has abeen shown on these two seismic lines.

Q But that's an inference based upon your interpretation.

A Oh, absolutely.

Q And there's no evidence that the porosity does not thicken as you go north of that shot point.

A Only through my regional geologic studies.

Q And isn't it true that TXO's proposed location is closer to that anomaly than the Viersen No. 1 Well?

A I'm not sure I understand that question. Closer to that anomaly, the Pennzoil Viersen No. 1 is located right in the middle of the anomaly. The TXO location is right on the edge of it.

No, I don't think it could be said it's closer.

Q But isn't it closer to that shot point?

A Oh, absolutely, yes.

Q So isn't it just as possible that there's as much porosity, the thickness of the porosity, that the TXO proposed location is just as thick as the porosity at

the Viersen No. 1?

A Based on my experience the probability of that is no.

Q Isn't it possible?

A I suppose it is possible.

Q Did you do the seismic that you've shown on your exhibit? Have you done anything other than interpret that seismic?

A Okay. In our company we work as a team effort. There was a geophysicist involved with this. Our geophysicists are involved in acquiring data, processing data, making sure it's reasonable. Then the geologist and the geophysicist work together on an interpretation, which incorporates the regional geology with the geophysics.

So, yes, I worked on it. Yes, someone else worked on it.

Q Since there is, Mr. Hair, no seismic data over the TXO proposed location, isn't it true that Pennzoil's seismic data does not necessarily condemn TXO's proposed location?

A It condemns the location by interpretation, by having data at that exact point. There is no geological or geophysical data at the exact well location and, no, you cannot condemn the space.

Q Based upon your seismic study, isn't it

possible that the northeast quarter is included within the same reservoir from which the Viersen No. 1 Well was producing?

MR. KELLAHIN: I'm going to object to the question, Mr. Examiner. He's asked whether it's possible.

I think most anything is possible.

We speak to experts in terms of questions that are framed with the phrase in reasonable probabilities based upon his experience, and I would request that the question be so phrased.

MR. QUINTANA: Will you please rephrase the question?

Q Based upon your seismic study is it -- is it not probable that the Pennzoil Viersen No. 1 Well is producing from the same Strawn reservoir that encompasses the northeast quarter?

A No, I don't think it's probable.

Q If you -- I have -- what are the numbers of these exhibits, Line 97 --

A These aren't numbered.

MR. KELLAHIN: Let me see.

THE REPORTER: Line 97 is Exhibit Twenty-seven.

MR. KELLAHIN: The other one is Twenty-six.

Q Which -- which line on Exhibit Twenty-five is Line 97? Is that the east to west?

A No, it's the north to south, as indicated on the top of the --

Q Okay. All right, I see. Can you prove from your study that the -- what you have shown on those two exhibits is the Strawn formation?

A Yes. Well, we can prove that it is the Strawn formation based on the velocity information obtained in the Viersen No. 1, which, as I testified previously, matches exactly with the seismic section.

Let me rephrase that: Exactly within 11 feet, right around a 5 percent error, which I think is acceptable at this depth.

Q Historically how successful has seismic data been in establishing stratigraphic production?

A Without being argumentative, could I ask, are you referring to this area, any area, where are we talking about?

Q Any area.

A Any area. Oh, in many areas it's been successful.

Q How about in this area?

A In this area, yes, it has been successful.

Q What is the basis for the -- what's this number, I'm sorry?

MR. KELLAHIN: That's Exhibit Twenty-four.

Q Exhibit Number Twenty-four, which is your Strawn porosity, what's the basis for the two reservoirs shown?

A In Section 4?

Q Yes.

A The basis for the two reservoirs shown is based on our seismic interpretation.

Q And the only well information that you have to base that on is the Viersen No. 1, is that correct?

A We have the Viersen No. 1. We have the Tipperary dry hole, which helps us confirm our work.

Yes, in this area that is the geologic information available to anyone.

Q What's the polarity of the seismic data that you're working from?

A I'm not sure.

Q Could be positive or negative?

A I just don't know. We have taken the processing informatoin of the lines, it's proprietary, and I

do not remember what it is.

Q Well, isn't it just as possible that you're picking the wrong seismic event in picking up the Strawn formation if you don't know what the polarity is?

A When the study was done the polarity was on the lines. Yes, we matched the polarity to the velocity information that we obtained in the Viersen. Without it on there, I cannot remember what it is.

But we know what the polarity is, yes.

Q What's the proposed location of your well in Section 3, which I believe you referred to as the -- well, now I can't remember the name of it.

A The No. 1 Waldron?

Q Yes. What's the footage location of that well?

A I do not have it in front of me. I'll have to find it.

It appears to me to be 1980 feet from the north line and 330 feet from the west line.

I will also state that that is not a proposed well at this time; no one has -- we have not proposed that well to the partners. It is just part of our development plan. That location is subject to amendment.

Q What's Pennzoil's interest in the west half northwest quarter of Section 3?

A I have no idea. A landman would know that.

Q Is it your testimony that -- that there's a barrier between these two porosity pods you've shown on your Strawn porosity maps?

A Based on our interpretation based on geophysics and our knowledge of the area, we feel that there probably is a barrier; it's possible that there is not.

Q Excluding the seismic data and based solely on the data from the Viersen No. 1 Well and the other Strawn wells in the area, would you disagree with the porosity pods shown on Mr. O'Hare's map, which is TXO's Exhibit Number Ten?

A I cannot agree or disagree. As Mr. O'Hare stated, the porosity pod can be drawn off the geology in any form or manner, so we disregard geophysics.

Q But your testimony about the area does not differ from Mr. O'Hare's significantly, does it?

A His general description of the pods in the area I agree with.

Q They're very small, isolated pods?

A In certain areas; in other areas they coalesce and form much larger systems. I'm speaking specifically of Lovington Northeast Field, about four and a half miles north of here.

Q Based upon your study of the area, what is the -- isn't it true that TXO's proposed location is the best location for defining the limits of the Shipp Field?

A That may or may not be true. It could either confirm our map or it may not, but I cannot testify to that.

Q Isn't Pennzoil's location in effect a wildcat location?

A As discussed in our development plan, we do not feel it's a wildcat location because we do intend to drill the B. E. Shipp State No. 1 first. We intend to use information from that well to drill the B. E. Shippp State No. 2. It will be a standard development well. Everything is confirmed up to that point; I'd say, no, it's not a wildcat.

Q You testified earlier that you felt that Pennzoil's proposed location was a significant risk, is that correct?

A I said that Pennzoil's location had exactly the same risk as any other Strawn well in the area, which is significant due to the fact that porosity can pinch out in one standard proration unit.

Q Isn't it true that TXO's proposed location has less risk involved in developing the Strawn, through economic producers?

A I cannot testify to that because in our interpretation it has much ore risk because they're drilling into a non-anomalous area.

Q If we consider that what you've shown in the northeast quarter represents two different porosity pods and if we consider that the northernmost porosity pod shown on your map is untested, wouldn't that indicate that your location is a wildcat?

A As I previously stated, we are going to dirll the B. E. Shipp first, which should prove that that pod is there, or disprove it; however you like to look at it, in which case that is a standard offset to a well and is not a wildcat location.

Q If TXO's application is approved in this case, will Pennzoil go nonconsent in drilling their location in the southeast quarter of the northeast quarter?

A I can only speak as to a recommendation I'd make to management; how management would take that recommendation, I don't know.

I would recommend that Pennzoil go nonconsent on that location.

MR. VANDIVER: I'll pass the witness.

MR. QUINTANA: Any further questions of the witness?

MR. KELLAHIN: No, sir.

MR. QUINTANA; I have no questions of the witness at this time.

Does anyone else have questions of the witness?

The witness may be excused.

MR. KELLAHIN: Mr. Quintana, that concludes our direct examination.

Mr. Vandiver, do you plan to bring rebuttal witnesses?

MR. VANDIVER: Yes, sir, I do. I'll ask Mr. Wood to come to the stand.

MR. QUINTANA: All the witnesses have been sworn?

MR. VANDIVER: All but one. One has not. Mr. Wood was but we'll -- we'll swear the other one --

MR. QUINTANA: Will you have him stand up at this time and we'll swear them at this time?

(Witnesses sworn.)

MR. QUINTANA: You may proceed, Mr. Vandiver.

DEEN WOOD,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. VANDIVER:

Q Would you state your name, please, sir?

A Deen Wood.

Q And what's your occupation and by whom are you employed?

A I'm a petroleum engineer. I'm employed by TXO Production Corporation.

Q Have you previously testified before the New Mexico Oil Conservation Division and have your qualifications been accepted and a matter of record in the OCD?

A Yes, they have.

MR. VANDIVER: Mr. Examiner, I would tender Mr. Wood as an expert petroleum engineer.

MR. QUINTANA: Mr. Wood, when did you last testify?

A It was a year, a year and three months. He remembers, Mr. Kellahin.

MR. KELLAHIN: I have no objection to Mr. Wood's qualifications.

MR. QUINTANA: Mr. Wood is con-

sidered a qualified petroleum engineer to testify.

Q Mr. Wood, you have heard the testimony of Mr. Williams this morning, or is that correct?

A Yes, I have.

Q And you have also examined the exhibits that he -- that have been presented through him, is that correct?

A Yes, I have.

Q Do you have any -- have you done an engineering study of the area in question?

A Based on the information available to us, I have.

Q And do you differ with any of the interpretations presented by Mr. Williams?

A I do. I have reached a different conclusion.

What I -- in my study I find that based on Mr. O'Hare's Isopach map, using a 6 percent porosity rather than a 12 percent Mr. Williams used, under the east half of the northeast quarter, there is approximately 600,000 barrels of oil.

That oil is oil in place; not all of it could be recovered; nevertheless, it is a considerable amount of oil and certainly worth drilling a well for, well within our economic criteria.

I looked at the matter of drainage. At the time I examined the information that was available to us what we had was the testimony and exhibits from the previous Pennzoil testimony that was presented as Exhibit -- Pennzoil Exhibits Number Seventeen and Eighteen in this hearing.

I have no great differences with Mr. Williams on the techniques that he used, but I do have some question about the validity of the conclusions that he reached.

I have to offer an exhibit.

MR. VANDIVER: Let's mark this as TXO's Exhibit Fifteen. Do you have a copy?

A This is -- you have a copy.

MR. VANDIVER: Excuse me just a minute. I'm lost under this pile.

Q Now I'll hand you what's been marked for identification as TXO's Exhibit Number Fifteen and ask you what that is, please?

A This is a drainage radius calculation based on Darcy's Law. It is the same calculation Mr. Williams presented in Pennzoil Exhibit Number Eighteen.

You'll notice, Mr. Examiner, that the numbers that I used in my calculations are very close to the same numbers that Mr. Williams used in his; however, the bottom line, the drainage radius differs by over an order of

magnitude.

What I want to point out here is that very small differences in any one of the variables, much less several, can lead to tremendous difference in the answer because it involves the natural logarithm function --

My calculated drainage radius was 780 feet.

Q And that's compared with Mr. Williams' calculation of 9090 feet?

A That is correct. That is a considerable difference, in my opinion.

Q What is the -- what creates the large disparity between your calculations?

A Basically, the biggest difference is caused by the difference in the oil viscosity and formation volume factors that Mr. Williams and I used. My, I'll call them fluid properties, my fluid properties were taken from standard correlations out of the Society of Petroleum Engineers Monograph Number Five.

Mr. Williams used PVT data from oil in a Strawn reservoir a number of miles away.

What I want to point out is that oil from two reservoirs, even from the same zone, can have remarkably different PVT properties, and in this case what I want to further point out is even small differences can cause tre-

mendous differences in drainage radius.

For instance, Mr. Examiner, I took Mr. Williams' calculation and left everything the same except for the formation volume factor. He used formation volume factor of 1.42.

I changed that to the formation volume factor that I used of 1.38 and came up with an answer that was 34.8 percent different. 0.04ths on that one number made a difference of 35 percent.

So I'm not going to claim that my 780 feet is a true and accurate number. It is my best estimate. But what I do want to point out here is that these drainage radius calculations, due to the sensitivity of the equation to the variables that go in it, are really not worth very much, and furthermore, I believe that if Pennzoil really believed that they were going to drain 9000 feet, they would not be drilling or proposing to drill two wells in the same pod, both within 1550 feet of the Viersen No. 1. Their drainage radius will be much shorter than that.

However, I would not contest with Mr. Williams that given our interpretation of the geology, that they will be draining a considerable portion, although not all, of our -- of the acreage under our proposed location. They will drain some of it and they will pressure deplete some of it, leaving some oil in place that would otherwise

have been recovered by our proposed well.

The next point I would like to bring up related in a way to drainage, inasfar as it affects the definition of the reservoirs, is the calculation for the distance to the anomaly.

Once again the technique used is standard; however, just picking out one particular variable, the porosity, which Mr. Williams used as 12 percent, I and several others at TXO independently reached different porosity numbers and a number that we believe is correct is much closer to 6 percent.

If a 6 percent porosity is used that 554 feet becomes 788 feet, which expands the reservoir much further than their geological interpretation would allow or their engineerng calculations.

MR. QUINTANA: 700 and what?

A I believe it was 788 feet with the 6 percent porosity. No other variables changed. The viscosity could change also, but again that was taken from PVT data from a different oil reservoir.

Also, as Mr. Williams pointed out in this testimony, the viscosity and also formation volume factor will change with time and pressure, and, of course, that's -- this snapshot of the reservoir at it was at one particular point in time, will change along with it.

Time has not allowed, but the proper approach to the use of these two equations would have been an extended study over a period of time with BBT and pressure data from the Viersen No. 1, and, of course, that has been impractical in this particular case.

The other thing I'd like to point out on that exhibit right here -- which one is that?

Q This one?

A Yep. Mr. O'Hare's exhibit, which is labeled TXO Exhibit Number Eight, if the Examiner will look in the upper righthand corner in Section 34, the Casey Strawn Field --

MR. QUINTANA: Which TXO exhibit?

A Exhibit Number Eight.

MR. QUINTANA: Okay.

A You'll notice that those wells were drilled on 40-acre spacing, quite close together, and that the cumulative production from each of the wells on the study there is tremendous. The smallest well cumed 257,000 barrels of oil, which is better than twice, or about twice what we think that you needed to drill the well for an adequate economic return.

So from that point of view I -- that further reenforces my belief that we certainly don't have any

problem with the risk involved in drilling the proposed TXO location. The risk, there is risk there just form a geological point of view, but those guys up there have drilled some tremendous wells.

In conclusion, I'd like to say that the reservoir, based on my evaluation, is not as small in the Viersen area as Pennzoil believes, and that we have a tremendous amount of recoverable oil under our proposed location that we deserve to get, and that if our well is not drilled, we will leave some oil in the ground that will not be recovered by the Viersen No. 1, and that that will be tremendous waste.

MR. VANDIVER: I'll pass the witness, Mr. Quintana.

MR. QUINTANA: Mr. Kellahin.

MR. KELLAHIN: Thank you, sir.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q The barrels of oil in place that you calculated when you began your testimony, Mr. Wood, were based upon your geologist's Ispach, Exhibit Number Ten?

A Yes, sir, it was.

Q Does that volume of oil in place represent the oil you calculate using that Isopach that under-

lies the northeast quarter?

A No, the east half --

Q The east half of the northeast quarter.

A -- of the northeast quarter.

Q All right. In addition to using your geologist's Isopach you have a difference of opinion with Mr. Williams about the percentage porosity.

A That is correct.

Q You used 6 percent.

A That is correct.

Q And he used 12 percent.

A Right. Had I used 12 percent you could effectively, a little bit over, double, the amount of oil under our lease, or our proposed location.

Q In terms of running through the computation and the calculation, Mr. Wood, what is the relationship of the porosity percentage used in terms of the resulting total oil in place that's calculated? As a porosity number goes up what happens to the oil in place number?

A If -- it increases. If you double the porosity, you double the oil in place.

In addition, an increasing porosity will favorably affect the water saturation, so actually doubling the porosity would do a little more than double the water saturation.

Q If you'd run through the calculation using a 12 percent porosity, what would happen to the end result in terms of barrels of oil in place?

A It would be much greater than that which I calculated.

Q And your calculation again is based upon Mr. O'Hare's --

A That is correct.

Q -- Isopach. Did you make a similar calculation using the porosity map that Mr. Greg Hair from Pennzoil testified to from the September hearing?

A No, I did not.

Q In terms of finding the distance to the anomaly using the calculation, you've got approximately 788 feet?

A That is correct.

Q I believe Mr. Williams testified the distance was 554.

A Correct.

Q All right. And then the last number was Mr. Williams had a number for the drainage calculation of something in excess of 9000 feet?

A Correct.

Q And what is your corresponding number?

A 780 feet.

Q Mr. Bourgeois testified earlier this morning that at least his understanding on behalf of his company that this area ought to be spaced on 80 acres; I asked the same question of Mr. O'Hare and he says geologically this ought to be developed on 80 acres; I ask you as an engineer now the same question.

Do you have an opinion with regards to what the spacing ought to be in this pool?

A At this point in time 80 acres is probably fine; however, the question, after the field has been defined, the question should be reopened and the possibility of a 40-acre proration unit should be examined.

Q Okay.

MR. KELLAHIN: I have nothing further.

MR. QUINTANA: Bear with me. Did you have -- did you want to ask any further questions?

MR. VANDIVER: Yes, sir, if -- after you're done.

MR. QUINTANA: Well, go ahead and proceed. Proceed now and I'll ask mine later.

MR. VANDIVER: Okay.

REDIRECT EXAMINATION

BY MR. VANDIVER:

Q Mr. Wood, you heard the testimony this morning about -- and you've testified about the anomaly or barrier, is that correct?

A Yes, sir.

Q And you testified that it was, what, 788 feet?

A Correct, that is my calculation.

Q Is there any way, based upon the formula you used, to determine what direction that barrier is in?

A No, there's no way to determine what direction it is. It is possible that it isn't a barrier. It could be a -- well, it could be caused -- there are other things that can cause that type of -- of anomaly.

A fracture system in tight rock can cause that type of thing.

Layering in a reservoir can cause -- can cause that type of thing. For instance, you -- if your pressure transient pulse was particularly strong in one zone and all of a sudden that zone played out, then you're liable to see a barrier there, whereas there some of the other strata in the producing interval could be much more continuous and exend further.

I do not know this to be the case; however, that is a possibility, and that zone is very thick with several intervals in it that have more developed porosity than others.

Q Mr. Wood, based upon your study of the area, what is the best location for -- now, for defining the limits of the Shipp Field?

A The best location, the location with least risk, and the location that reduces waste, is the proposed TXO location.

MR. VANDIVER: I'll pass the witness, Mr. Quintana.

MR. KELLAHIN: Nothing further, thank you.

RECROSS EXAMINATION

BY MR. QUINTANA:

Q Mr. Wood, Wood or Woods?

A Wood.

Q Mr. Wood, based upon your experience in the area, dealing with Strawn production, what type of anomalies have you seen in that area?

A Not, really, not very many. Most of the anomalies are porosity pinchouts. In this case it's really difficult to tell. It's probably, probably is a porosity

pinchout but I couldn't say for sure whether that entire zone just suddenly pinched out. That would seem unlikely to me, due to the fact that you have several zones that do have porosity, distinct zones with porosity development, which you can see on the logs.

It's quite possible that one or two of those suddenly pinch out and another one that's capable of prolific production extends and covers a much wider area.

Q So basically what you're trying to tell me is the anomalies you have seen were porosity pinchouts.

A Yes, as far as can be determined.

Q Bear with me.

A Actually permeability pinchouts would probably be a better way of putting it.

Q When you calculated, using Pennzoil's Exhibit Number Nineteen, when you reworked the radius of the anomaly, why did you not change the viscosity of the oil in that calculation as you did on TXO Exhibit Number Fifteen?

A I was simply trying to illustrate what one -- what a difference in one variable could cause the bottom line, how much the bottom line would change with a small or medium difference in one single variable.

Q All right. As an engineer -- as an engineer in your company and -- as an engineer in your company, would it not be to your advantage to wait for the

drilling of the Shipp No. 1 Well on the west half of the northeast quarter in order to obtain additional data? Yourself as an engineer, wouldn't you rather wait for additional data from which to make determinations and recommendations to your -- your bosses in order to determine where to place another well?

A Well, any time the more data you've got, of course, the better off you are, but in this case we've got the maps that we believe in and the Viersen Well, we're directly offset to the Viersen Well, and that's pretty good information to go ahead and drill a well on, especially when drainage could be a problem.

The well that they propose to drill would be further away from us, I believe, than the Viersen Well is.

Q To your knowledge, would you confirm this again, TXO has signed the AFE to drill that Shipp No. 1 Well?

A Yes, sir, to my knowledge.

Q To your knowledge do you know if TXO is operating under any time constraints in order to drill your proposed well?

A Only insofar as certain agreements go. I'm not familiar with all the terms of the farmouts and leases and things but that, as far as I know, would be the

only problem, is trying to get the well drilled before we had leases that expired, and I'm not aware of what the terms, how short a time period we're talking about.

Q If I were to take your -- assuming that I were to take your calculations and say that the Shipp No. 1 Well would be draining the south half of the -- the south -- the southern part of the east half of the northeast quarter where your proposed well is, how much drainage do you think would occur between the time that the Shipp No. 1 Well would be drilled and the data obtained from there before another well could be drilled, either your well or the Pennzoil proposed well?

A How much the Viersen would drain or the Shipp No. 1?

Q The Shipp No. 1. Do you think there would be substantial drainage?

A Well, between that and the Viersen both, there could be some substantial drainage. I'm not really, I don't know really what the time frame would be, the longer the worse, but as prolific as their well is, it could cause some substantial drainage.

MR. QUINTANA: No further questions.

Any further questions of the witness?

MR. VANDIVER: Yes, sir, just one or two more.

REDIRECT EXAMINATION

BY MR. VANDIVER:

Q Mr. Wood, the reason that you want to drill this well, is it not, is that you feel that it's a good location to establish an economic well.

A Yes, sir, low risk, lower risk.

Q And you feel that there is -- that it's -- do you feel that it's probable that you're being drained from the Viersen No. 1?

A Yes, sir.

Q And you don't want to wait because you don't want to be drained, is that correct?

A That is correct.

Q If I could ask you one more question. You're familiar with the cross section, Exhibit Eleven, TXO's Exhibit Eleven?

A Yes, sir.

Q And have you examined the log of the Viersen No. 1 Well?

A Yes, sir, I have.

Q Is there any indication on that log that there's an average 12 percent of porosity?

A No, sir, there are very few -- very few intervals on the log that exhibit 12 percent porosity.

Q And what would -- what do you think would be a better average?

A 6 percent.

MR. VANDIVER: I'll pass the witness.

MR. KELLAHIN: Nothing else.

MR. QUINTANA: I have one more question.

RECROSS EXAMINATION

BY MR. QUINTANA:

Q This is a hypothetical question and the reason I ask it is not because I'm deciding one way or another, it's because I have to look at all my options.

Should it be decided that I make a decision to allow the Shipp No. 1 Well to be drilled first, would you object to it if there was some type of restraint put on the Shipp No. 1 Well so you would not -- there would not be any drainage during the time this other well is being drilled. Let's say it takes three months to drill the well, or two months, you know, Pennzoil is going to have a reason to get the well drilled and getting that out if they have some type of a short term penalty placed on the Shipp No. 1

Well so as to not cause drainage to occur, would your company be objectionable to that?

A I can't speak for my management but as far as what I would recommend, it would be that and perhaps some restraint on the Viersen No. 1. The Viersen, the direct offset well is, in the immediate future and until more is known about the Shipp No. 1 location, the Viersen No. 1 is a clear and immediate problem inasfar as drainage is concerned.

Q Thank you.

MR. QUINTANA: Any further questions of the witness?

MR. VANDIVER: No, sir.

MR. QUINTANA: If not, you may be excused.

MR. VANDIVER: Mr. Quintana, I believe I'll just have one more witness.

MR. QUINTANA: You may proceed.

EDDY PEARSON,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. VANDIVER:

Q Would you state your name, please, sir?

A Eddy Pearson.

Q Where do you live, Mr. Pearson?

A Midland, Texas.

Q What's your occupation?

A Geophysicist.

Q By whom are you employed?

A TXO.

Q You'll have to speak up.

A TXO.

Q How long have you been so employed?

A I've been with TXO for nineteen months.

Q Would you briefly -- you've never -- you've never testified before the Oil Conservation Division before?

A No, I have not.

Q Would you please tell the Examiner about your education?

A I graduated from Texas Tech University with a BS in geophysics in May, 1981, and at that point I went to work for Getty Oil Company for three years, and as I said, I've been with TXO for nineteen months.

Q Have you had an opportunity to review the

exhibits submitted by Pennzoil with reference to their geophysical data?

A Yes, I have.

Q And have you -- have you reviewed other geophysical data in the area in question?

A Yes, I have.

MR. VANDIVER: Mr. Examiner, I would tender Mr. Pearson as an expert geophysicist.

MR. QUINTANA: Mr. Kellahin, any objections?

MR. KELLAHIN: (Not clearly understood.)

MR. QUINTANA: The witness is considered a qualified geophysicist.

You may proceed.

Q Mr. Pearson, you've heard Mr. Hair's testimony this afternoon and this morning concerning their seismic data surrounding the area in question, is that correct?

A That's correct.

Q Do you have any -- do you differ in any way from his interpretation of the data being submitted?

A Well, first of all, I haven't independently established that their reflection that they're mapping is indeed the Strawn. I haven't had access to that in-

formation.

I was made -- this data was made available to me by Pennzoil last month that I worked in their office and I constructed a map. Have you got that map with you?

I interpreted the seismic data in Pennzoil's office since it's proprietary data, and I just basically took their word for it that the event that they were mapping was the Strawn, and based upon my interpretation, using their Strawn pick, I can't validate that there's a separation between the two porosity pods.

I'm basically in agreement with Mr. hair's interpretation of the seismic data but I feel he's being unduly pessimistic about the qualities of the seismic data at our location and I'd -- I'd just like to point out, if I could, --

MR. QUINTANA: Could you step back that way so that everybody could see?

A The seismic anomaly that Pennzoil drilled based on its seismic line was at Shot Point 175, which is this anomalous feature here, and I'd just like to point out that our location north of this line is parallel with this seismic anomaly and based upon projecting it in, you can project in, of course, based on regional, but my interpretation is that this is one complete pod and if you can't justify

this low separating it, I don't think that there's sufficient evidence to back that up.

And furthermore, like I said, I was not given access to any information about the top of the Strawn reflector. If this is not the Strawn reflector, he's calling this the low side, which he's -- or the thin spot, excuse me, that he's projecting in here (not clearly understood). If he's off one seismic event, one leg, then this could actually be the top of the Strawn, which appears to be a thick at that location.

And you can project this thick coordinate on his map to show that our location is still valid. But like I say, it's highly interpretive. You know, the map that I constructed looks very similar to this with seismic anomalies that were mapped at this portion of the seismic line, and this portion down here, also, which I have interpreted to be one continuous reservoir.

Thank you.

Q I have handed you what's been marked for identification as TXO's Exhibit Number Sixteen and ask you what that is?

A This is a map that I constructed based on Pennzoil's seismic data. I was actually made available two other lines that aren't available for an exhibit today.

And what you're looking at is the thick-

ness, which Mr. Hair pointed out, of his yellow seismic anomaly on his seismic line, as I map the thickness on that, and what -- the values that you see here is nothing more than time, it's an Isochron, time thickness of the Strawn, which is purely the geophysical interpretation. There's no geology on this map, which is why I'd like to point out that I think that their map is very heavily favored toward the geophysics since it resembles my seismic map so closely, or roughly parallel.

And I just think that there's a lot of room left for interpretation. I don't think that you can split those two pods like that based on the information that we had available to us.

But like I said, nevertheless, I am still basically in agreement with Mr. Hair in his interpretation. I just think he's being unduly pessimistic about our location.

Q But based upon your study of the information they made available to you, have you reached any conclusions about the nature of the reservoir in this area in question?

A The nature of the reservoir?

Q Yes. You testified that you -- you -- that there was no evidence that there were two different pods.

A Well, he's showing, like I said, he's showing a thin spot based upon seismic data, which may or may not be there. I'm representing that on my map as a thin spot along that seismic line, but to take that one point and to project it completely across our lease, I think is unreasonable.

Would you like me to point that out for you?

Q Yes.

MR. QUINTANA: Yes.

A He's taking this flat spot, or thin spot, right here, can you see the difference between these two spots, seismic events, what he's calling thick and thin? He's taken this thin spot on the seismic and projecting it from here all the way across our location, based upon this one seismic line.

Q And how do you differ from that?

A Well, I think it's thinner here than it is here, but I don't think it continues all the way through.

Q I see.

A And I think that's what they're basing their thinness on, or that's the way I interpret it.

MR. QUINTANA: You say you think. What do you base your thoughts on, you know, that it doesn't extend out there? Is there another line that you

took that from that we are not able to see here that was in their office, or something?

A Well, like I said, I examined these four seismic lines.

MR. QUINTANA: But for purposes of the record, state to the --

A Yes.

MR. QUINTANA: I mean what exhibit are you looking at?

MR. VANDIVER: He's looking at Exhibit Number Sixteen.

A Exhibit Number Sixteen.

MR. QUINTANA: Okay.

A There are four seismic lines outlined in blue here that I was able to work up and there's another seismic line that runs parallel to the Exhibit Number 97, that I was able to work.

MR. VANDIVER: That's Line 97.

A Right. Exhibit Number 27.

MR. QUINTANA: Parallel, was it north or south of it; north or south of the -- when you say parallel, was it north of that line or south of that line?

A It was -- it paralleled that line on the east by approximately a half mile. They're approximately a half mile apart and they run parallel.

MR. WOOD: That's right.

A And based upon the anomaly that I saw on the line that we do not have today, and also based upon another east/west line that runs across the north section line of Section 4, I've interpreted this to be the same reservoir.

This seismic line on Exhibit Number Twenty-five, I was able to work that data. I was also able to work this data.

Q Mr. Pearson, is there any method for converting seismic data to porosity data?

A None that I know of.

Q Based upon the seismic data that you've been presented, is there any indication that the porosity at TXO's proposed location is any lower than the porosity at the Viersen No. 1 Well?

A According to my interpretation, that we will actually have thicker reservoir at our location, based upon seismic data.

Q And that's just your interpretation of the seismic data.

A That's correct.

Q And so you just differ in your interpretations.

A That's correct. Seismic data is highly

interpretive, but I feel that based on my interpretation we have as good a location if not better than the Viersen well.

MR. VANDIVER: I'll pass the witness, Mr. Quintana.

MR. QUINTANA: Mr. Kellahin?

CROSS EXAMINATION

BY MR. KELLAHIN:

Q Mr. Pearson, you testified that Pennzoil invited you over there to their office about a month ago to share this proprietary seismic information with you?

A That's correct.

Q And approximately when was that? Was that before or after the spacing hearing on the 11th of September?

A That was before. Wait, I don't recall, to be honest with you.

Q It's been about thirty days ago, I guess. Sometime in September?

A I remember it was last month and that's all.

Q Prior to that time, Mr. Pearson, had you been involved in examining, analyzing, or interpreting other seismic data in this immediate area?

A Yes, I have. I had interpreted some

seismic data in the -- excuse me for a minute. I forget the field name. It's south of here -- Humble City South, I'm sorry.

Q In the Humble City South Strawn Field to the south --

A Yes.

Q -- and to the east of this?

A Yes, sir.

Q Did you provide any seismic interpretations for the well TXO drilled in Section 33 to the north, their --

A The Carter F?

Q Yeah, Carter.

A No, sir, I did not.

Q Who else was present besides you, Mr. Pearson, in Pennzoil's office when you went to see their seismic data?

A Bradley Jones at Pennzoil is the one who made the data available to me and Mr. O'Hare, our geologist, was also present for about the first thirty minutes, or so.

Q Mr. Jones is Pennzoil's geophysicist?

A Yes, sir.

Q Do you recall if anyone else was present?

A Not while I was interpreting the data, no.

Q Did Mr. Jones share the seismic lines with you and the underlying data upon which these lines were based?

A He laid the seismic lines out for me. They were uninterpreted. They were just clean seismic lines and he was very cooperative. He showed me, he said, "This is our anomaly. This is what we drilled."

Q Did you ask any questions about the quality or the degree of accuracy of the underlying data to which you examined to satisfy yourself that it was reliable, from which you could draw conclusions?

A Yes, sir. You can also determine by the parameters that they used when they acquired the data and when they processed the data, which is available in the headboard, which we do not have here today.

Q Were you satisfied at that time that the information that you were looking at was accurate and reliable?

A Yes.

Q How long did you spend in Pennzoil's office looking at that information?

A Approximately three and a half hours.

Q Did they give you copies of that information or allow you simply to work with that information in their office?

A They allowed me work with that information in their office.

Q And you made from that information various notes and whatever in order to prepare Exhibit Number Sixteen?

A Yes. I wrote down the seismic times.

Q Did you discuss with Mr. Jones the possibility of a disagreement as to the pick of this Strawn reservoir either Line 87 or Line 97?

A No, I did not. I took his word for it.

Q At the conclusion of that meeting and during that meeting, did you not indicate to Pennzoil's representatives present that you were in agreement with their interpretation of this data?

A No, I did not.

Q Did you advise them at that time that you had any disagreement with the conclusions or interpretations that they were making?

A No, I did not.

Q When we look at the information that you've described for us, how do we determine the velocity control for the exhibit?

A There's -- there's no need for velocity.

Q Why not?

A It's just a straight line. You use velo-

city to come up -- to arrive at your depth figure, the feet that you want to use, and like I was -- I meant to point out earlier, that Mr. Hair says their data fit exactly their interpretation and missed it by eleven feet.

Well, I would just like to point out that seismic data is recorded in time and you have to manipulate the seismic data with an equation, which is velocity, to arrive at feet.

I have not manipulated this data in any way. I just picked the times off the seismographic.

Q Have you taken Mr. Hair's Isopach from the September hearing, Mr. Greg Hair's Isopach from that September hearing, and attempted to interpret that seismic map in relation to the -- that Isopach map in relation to the seismic work that you've examined?

A Would you show me a copy of that map?

Q Yes, sir.

A Yes, I looked at that one.

Q It's Exhibit Twenty-four. You've looked at this?

A Yes, I've seen it. And what was your question again? I'm sorry.

Q With regards to the interpretation you've made of the seismic information and data --

A Uh-huh.

Q -- if I understand you correctly, the difference that you have with Mr. Greg Hair as to Exhibit Twenty-four and his Isopach, is the significance of the decrease in thickness between the two pods. You believe he's overstated that decrease?

A I don't believe he has sufficient information to separate the two pods.

Q I believe I understood correctly your direct testimony is that but for that difference, you and Mr. Hair are in general agreement about the interpretation of the seismic data.

A That's correct. Based upon what they have shown me to be the top of the Strawn. Like I say, I have not independently confirmed that that is the Strawn reflection.

Q Does it materially change your conclusions if you subsequent to this hearing satisfy yourself that that in fact is the Strawn reflection for this reservoir?

A No, it does not. My map is based upon their pick for the Strawn.

Q All right. May I have a moment?

MR. QUINTANA: I have no questions of the witness.

Are there further questions of

the witness?

If not, he may be excused.

MR. VANDIVER: Mr. Quintana, at this time, if I could, I would like to call, recall, Mr. Davis just for the purpose of establishing one -- one item, which shouldn't take but a minute or two.

MR. QUINTANA: Fine. We'll recall Mr. Davis.

GREG DAVIS,

being recalled and being still under oath, testified as follows, to-wit:

RECROSS EXAMINATION

BY MR. VANDIVER:

Q Mr. Davis, you've previously testified today in this hearing?

A Yes, sir.

Q And you heard the testimony as to Pennzoil's land which, as I understand, has not been proposed to drill a well in the southwest quarter of the northwest quarter of Section 3?

A Uh-huh.

Q What is Pennzoil's interest in that tract?

A Well, you've got a 40-acre lot up in the -- I believe it would be Lot 4, that is HBP Mesa acreage, so it would be Lot 3 in the south half northwest quarter, we have approximately 92 percent of that (not understood.)

MR. VANDIVER: That's all I have, Mr. Examiner.

MR. QUINTANA: Mr. Kellahin?

MR. KELLAHIN: Nothing further.

MR. QUINTANA: Mr. Vandiver, I don't recall if we've admitted Exhibit Number Sixteen and Number Fifteen.

MR. VANDIVER: I'll -- I don't know if I asked whether they were prepared by the witnesses and I will recall the witnesses for that purpose if you'd like me to, but otherwise I'll move the admission of those two exhibits.

MR. KELLAHIN: I have no objection.

MR. QUINTANA: Fine. We'll admit Exhibit Number Fifteen and Exhibit Number Sixteen for TXO Production as evidence.

MR. VANDIVER: And that's all the testimony and evidence I intend to present at this time.

MR. QUINTANA: Mr. Kellahin, do you have further testimony to present?

MR. KELLAHIN: I do not. We're prepared for closing argument at the appropriate time.

(Thereupon a recess was taken.)

MR. QUINTANA: Mr. Kellahin?

MR. KELLAHIN: Thank you, Mr. Quintana.

We appreciate the length of time that you've devoted to this case. I think it has a great number of very interesting issues in it. I hope we can solve all of them to everyone's mutual satisfaction.

I hope it has come across that Pennzoil is not attempting to run roughshod over any other interest owners in this area. We understand that TXO has a very small interest. We can see from the calculations of interest by the landmen that have discussed the case that TXO came into this northeast quarter with about six percent.

You can also see that in the northeast quarter, let's see, I'm sorry, we've got TXO with about six percent. We've got Pennzoil now with what I calculate to be about 63 percent of the working interest owners in support of their well location, but you can throughyour own calculations as well as I can. Some of the working interest owners have sent the same letters to both sides.

The point is, though, that we have shared some very sensitive proprietary information that many operators won't share with each other. We did that not only for TXO but we've done it for any of the other working interest owners that wanted to come to the office and look at this information.

We believe our interpretation of this information and it has proved successful because, as Mr. Hair testified to back in September and as he testified to again today, that Viersen No. 1 Well was drilled based upon that seismic data. You can see from his testimony how loosely it matches the seismic data. They were very successful with the new discovery.

They have shared that information and they are not seeking a position where they can use their greater percentage interest in this area to gain more than their share of the oil. Had we wanted to do that the next well in this pool would not be the Shipp No. 1 or the Viersen No. 2, it would be that Waldron Well in Number 3 and would siddle up close to the interest of TXO and would drain them. But that's not the point and that's not what we're trying to do.

What we're trying to do is to develop in an orderly fashion to the maximum benefit of everyone the pool that we discovered. And how have we done

that? We've done that by coming before the Division back in September and requesting 80-acre spacing, and that's an integral part of your decision today, is how you're going to allow this case to affect the orderly development of the pool.

Apart from the spacing, if you were looking at this case as a typical forced pooling case, all the little points you check off to the side who'd win, or checked off in favor of Pennzoil. We have developed the area. We have a development plan for the area. We have the discovery well. We have the greatest interest committed to ourselves voluntarily. We were the first to suggest the further development of this. We have an AFE that's been accepted by others as reasonable; even TXO admits well costs are not a factor. Overhead charges are not a factor.

All those things which you typically decide operations on are in favor of Pennzoil.

It is Pennzoil and not TXO that operates most of the Strawn wells in this immediate area. I think TXO's closest well was a number of townships away.

We have earned, you don't have to give it to us, we have earned the right to operate this well.

One of TXO's concerns, and it's obviously apparent, is they are concerned about what will

happen to their acreage in the northeast quarter in relation to the production from the Viersen No. 1 Well.

In addition we have seen TXO's philosophy at work today. They pick a location and they cozy up to a good well. There is -- there is no argument about that. They staked this well just minutes after, if not days after, the Viersen Well was completed, long prior to their efforts to actually formulate specific geologic and engineering information. What do they do? They move in close and that's just the last thing you'd want to do.

We've asked all their witnesses, we've asked our own witnesses, what do we do with this pool? Everybody says, it's worthy of 80-acre spacing. That's what we ought to maintain and how do we maintain that? By a logical pattern of well locations.

You can see in the southwest quarter of 4 the Viersen Well is in the northeast corner of that quarter section.

The Viersen No. 2 is in the southwest quarter. They're in logical well locations to actively develop 80-acre spacing and they conform to the orientation of the reservoir as agreed by all the geologists, it runs northeast/southwest.

In addition, for the northeast quarter we have located the wells again using the same loca-

tion pattern, northeast corner, southwest corner, of the 160. That is the logical pattern to develop the reservoir. We've shown it on the exhibits. You can see by the circles around the well locations what happens if you let TXO have this location; you've reduced this pool to 40-acre spacing.

There's no doubt that you can crowd three or four wells 40 acres apart and produce the oil out fo the reservoir, but that does not maximize the recovery of oil from the reservoir; that does not protect correlative rights; it doesn't do anything but drill unnecessary wells.

Let's look for a moment at TXO's Isopach. If they are concerned about drainage and counterdrainage, and if they believe that that Isopach, Exhibit Number Ten, if they believe this Isopach, we're going to learn some things about the reservoir that will balance the correlative rights of the parties.

You can see from the proposed Shipp well, number one, in the west half of the northeast quarter, that that is a well to which TXO has agreed with Pennzoil that Pennzoil may drill it. It's one that's about to be drilled; all these wells are going to be drilled, hopefully, before the end of the year. That is a well in which we're going to receive information and it will place TXO's acreage in the position of being productive. They

will be in a position where drainage and counterdrainage are balanced between the reservoirs. It gives all operators or working interest owners additional reservoir information.

We concur in the Examiner's suggestion that that well is important and ought to be drilled before the one in the east half of the northeast quarter, and we would suggest to you that that order be entered first and the Shipp 1 Well be drilled first.

We don't think it's going to make a difference becaue we believe our seismic interpretation, our geology, and the interpretation that this is essentially two pods. It is going to give you some information by which you can in an abundance of caution determine which potential operator is more closely to being correct.

If you'll compare the two Isopachs you'll see that the proposed location for the Shipp No. 1 Well is projected to encounter a porosity thickness in excess or equal to about 40 feet.

If you make that same location pick on the Isopach that TXO's presented, we ought to find a well that represents something less than that. There may lie enough difference in the wellbore information derived from the well from which you can confirm one theory and prove the other. I'm not persuaded that's absolutely true, but if you think that's helpful to you, I see no reason that

that well can't be drilled first. That's our plan of development and that's the one we want, want to utilize.

In addition, I think it's important that you understand that in order to preserve 80-acre spacing, you cannot let the next well drilled in here undercut that spacing pattern.

If our theory of development proves inappropriate, we have committed to a schedule that will drill these wells quickly. If it is inappropriate and we cannot prove our interpretations, it is possible for the Division to require additional drilling; there could be infill locations; a lot of things could happen, but we would urge you not to allow a well location that is in such close proximity to the Viersen No. 1 to be one of the next wells drilled, because as you know, the drilling of an unnecessary well is a wellbore that's drilled and cannot be undrilled.

We appreciate the opportunity to appear before you today. We have shown you information that is not typically shown in such hearings. We have relied upon this seismic data and as Mr. Hair has testified in every instance of having wellbore information or actual geologic information, it confirms his conclusions.

If you follow TXO's theory to a logical conclusion as depicted on some of these exhibits, you can see that being in close proximity to a producing

Strawn well does not always result in success.

Mr. Hair has shown you on some of his exhibits and, in fact, TXO has shown us on their own exhibit, that they can be in close proximity to producing Strawn wells and then very successfully drill a dry hole.

Do not be influenced by the fact that they can redraw an Isopach to show some thickness in their quarter section. It's our firm belief that that is not true.

I think the importance of the engineering calculations is significant to you. We had one engineer use 6 percent porosity; another use 12; Mr. Williams has testified before you on two occasions how he realized the 12 percent porosity; he used it from log interpretation; he used it based upon experience factors in other Strawn pools. He says, in essence, that the size and shape of this reservoir is such that you've got to calculate in order to fill the reservor with the volume of oil that's produced by some of these reservoirs, you can't realistically expect porosity in the 6 percent range. He says it's more likely to be 12 percent.

You can run up those calculations. Mr. Wood did them, Mr. Williams did them, and we see that that anomaly varies between the two calculations. One fellow had 788 feet, the other guy's got 547, whatever. I

maintain to you that's not a signficant difference. I think that's very important in determining and confirming the orientation of the pods as we've interpreted from the seismic, that either one of those calculations is reasonably consistent with our location of the reservoir.

We again thank you for your patience. I would like an opportunity to submit to you a proposed order for entry in this case. We believe that we have proved beyond a reasonable doubt by a substantial margin of the evidence that Pennzoil ought to be awarded operations for both pooling cases, particularly the east half of the northeast quarter and that our location is the one that ought to be drilled.

MR. QUINTANA: Thank you, Mr. Kellahin, and I will accept a proposed order in light of the fact that I have a short period of time left here at the Oil Conservation Division. I would appreciate that in order to expedite orders for all interested parties.

Mr. Vandiver?

MR. VANDIVER: Thank you, Mr. Quintana.

I, too, appreciate the time that you have devoted to this hearing. There is a lot of evidence that's been presented, a lot of opposing viewpoints, and I trust that the evidence has enlightened you as

to what the parties' intentions are in this case.

To paraphrase, me thinks Mr. Kellahin protesteth a little too much about not running roughshod over the other interest owners in the area of this well. I think that it's obvious from the nature of this land and the nature of the location that's what Pennzoil was trying to do in this case. If you will look at all the evidence that's been presented, you'll see that with respect to the east half northeast quarter Pennzoil is trying to get as far away from the Viersen No. 1 as possible.

On the other hand, with respect to the west half of the southeast quarter Pennzoil is trying to get as close as possible to the Viersen No. 1 Well.

So I think the reason for that is obvious: Pennzoil owns 94 percent interest in the southeast quarter somewhere around a 37 or 39 percent interest in the northeast quarter.

Pennzoil, in effect, wants to drill a wildcat well in the east half northeast quarter. They really, I believe, hope that they do not make a good well, because they want to withdraw as much oil as they can as quickly as they can from the Viersen No. 1 Well and they want to drain the east half of the northeast quarter, and drainage, all the evidence shows, that drainage is occurring.

The order of their proposed development is that they will drill the Viersen No. 2 Well in the southwest quarter of the southeast quarter, which is approximately a quarter of a mile away, and they ask in the earier case, Case Number 8696, in the alternative for an unorthodox well location so that they can get closer to the Viersen No. 1 Well.

After drilling that well they propose to drill the Shipp No. 1 Well in the southwest quarter of the northeast quarter, again at the closest possible location to the Viersen No. 1 Well.

And then they're going to go up in the northeast quarter of the northeast quarter and drill the -- what they will call the Shipp No. 2 well and finally they propose to drill the Waldron No. 1 Well in the southwest quarter of the northwest quarter of Section 3 of the same township, 330 feet from the section line between Section 3 and Section 4, and in that subdivision they own a 92 percent interest.

So if you will look at their exhibit, at their exhibit numbers -- I'm sorry, I don't have the numbers -- but their exhibits showing the 80-acre radius for the TXO proposed location and the Pennzoil proposed location, you'll see these three wells are going to be as near as they can get the Viersen No. 1 but the Shipp No. 2 is

going to be as far away as they can possibly get, a half mile away.

TXO, I'd also point out, that the testimony is that the mineral ownership of the southeast quarter is not in common with the mineral ownership of the northeast quarter. It's totally separate. Those -- those parties owning mineral interest in the northeast quarter own no interest in the southeast quarter.

The leasehold ownership in the northeast quarter is different from the leasehold ownership in the southeast quarter, except for two parties, being Pennzoil and The Superior Oil Company, who has approved, according to the testimony, their location.

Those two parties together will own over 50 percent of the leasehold interest in the east half of the northeast quarter and it is, I would submit, to their advantage to get as far away as possible from the Viersen No. 1 Well and drill this wildcat well in the far northern portion of the east half northeast quarter so that they can remove as much oil as quickly as they can from the east half of the northeast quarter.

TXO is not asking for anything other than an opportunity to recover its fair share of the oil in place in this reservoir, but it will not be -- not have an opportunity to recover its share of the oil if it's

not given the opportunity to drill this well at the proposed location of the Grisso No. 1 Well.

I think that it's probably true that Pennzoil has produced evidence that would not generally be shared in this case. They've presented their seismic data and interpretations, and that is in an effort to convince the Examiner that this is not a wildcat well; that there are two separate porosity pods, but there is, Mr. Examiner, no well information that will indicate that there are two separate porosity pods.

The better information and the stronger evidenc indicates that it is one porosity pod; that it is one reservoir that extends up into the east half northeast quarter.

The testimony has been, and it's uncontroverted, that the Viersen No. 1 is draining the east half northeast quarter. I think that' it's -- there's also been testimony from TXO's witnesses that if TXO is not given an opportunity to drill the Grisso No. 1 at its proposed location, that there will be oil that will be unrecovered in this case.

If you will -- I'd like to point out, Mr. Examiner, that this is not the typical forced pooling hearing, forced pooling application. I think that the evidence has indicated that all parties owning operating

rights in the east half northeast quarter will participate in either of the proposed locations. I think that it's just a matter of looking not at what Pennzoil says about this case, but what they do and what they plan to do, and their plan is to recover the oil from the acreage upon which they own 94 percent interest in the operatig rights and to avoid, if possible, recovering the oil from the tract in which they own a 37 percent interest, and the same goes for Superior Oil Company.

Mr. Examiner, I think that the testimony with respect to the risk of drilling this -- these wells is very interesting. TXO, believing that -- that its proposed location, and I don't think that it can reasonably be argued that its location is the greater risk. I think that TXO's proposed location is the smaller risk, and there's much more, much better opportunity of obtaining commercial production from that location, and for that reason they have asked the Oil Conservation Division to impose only 100 percent penalty on those parties who may elect not to join in drilling this well.

TXO proposes to define the limits of this new field. Their location is some 870 feet away from the Viersen No. 1, while the Shipp No. 2 will be a half mile away.

Now, Mr. Hair testified that he

thought both of the locations had significant risk and he asked for the 200 percent penalty. I think that the fact that he is willing to admit that there is a high risk in drilling his location is indicative of what the facts are in this case, but I think that the best location for defining the limits of this field and for fully recovering the oil in place is, obviously, the TXO location.

Pennzoil is attempting to destroy the correlative rights of the mineral interest owners in the northeast quarter and the parties owning leasehold interest in the northeast quarter and for that reason, Mr. Examiner, I think that it's obvious that Pennzoil is not being a prudent operator in this case. TXO is being the prudent operator in this case.

TXO wants to do what a prudent operator would do and that is to define the limits of this field by drilling the next logical location and that location is in the southeast quarter of the northeast quarter of Section 4.

When you consider that Pennzoil by wanting to drill its proposed location is not being a prudent operator, and I think that that's obvious when you look at the evidence with respect to their ownership in this east half of Section 4, both the disparity between ownership in the southeast quarter and the northeast quarter, I think

the obvious -- the reason is obvious that they do not wish to be a prudent operator in this case.

They want to recover as quickly as possible as much oil as they can from the Viersen No. 1 Well.

TXO filed its application for permit to drill on, I believe, August 26, and Pennzoil filed its application thereafter.

TXO has the right to drill at this location and it's the more prudent location to fully recover all the oil in place, and they would ask -- I would ask in their behalf that they be given the opportunity to recover their fair share of the oil in place in this pool and ask that their application be granted.

MR. QUINTANA: Thank you, Mr. Vandiver.

Would you be opposed to submitting a proposed order?

MR. VANDIVER: No, I'd like to, sir, thank you.

MR. BATEMAN: Mr. Examiner, if I may, thank you and my colleagues for giving me an opportunity to make a statement.

I have enjoyed the breadth and depth of the testimony and information that's been given you

in this case.

As Mr. Kellahin pointed out in his cross examination of the first witness, this is a case in which there's very little dispute about anything except the principal question and that is the geologic-geophysical evidence in which there is, obviously, a very considerable dispute with respect to which of these locations is the most prudent.

As a reflection of that you see that there is a considerable amount of working interest and other mineral interest uncommitted at this point, or committed to both sides, which essentially is uncommitted.

I do think that's a reflection of the confusion about what the geology illustrates and it's left to you to make the decision for those uncommitted interests.

One of the statements that has been made, and I want to state at least what my information is about it, is that the East Lovington Unit has a combined interest of 9.3125 percent in the acreage in the east half of the northeast quarter. Of that total percentage Texaco's interest and other committed interest in the unit totals 4.3408.

Texaco has essentially made its own judgment with respect to the geology and has authorized

me to state for the record that its interest is committed to the TXO location, and in that connection, therefore, I urge your approval of TXO's application.

Thank you very much.

MR. QUINTANA: Anybody else that wishes to state any closing statements?

State your name for the record.

MR. MAX COLL: My name is Max Coll. Again I represent myself and my three brothers, who have a 1/32, or a 3.125 percent working interest in the northeast quarter only. We have zero interest in the southeast quarter.

Therefore, we're most interested in protecting our correlative rights by producing oil through tank batteries that will be located so as to produce oil from the northeast quarter. That's where our only interest is.

On the other hand, it appears to me that Pennzoil has virtually all of the interest in the southeast quarter and virtually all the interest in Section 3, and they would like to optimize producing the oil through tank batteries that would optimize their ownership of the oil.

As I recall, TXO's proposed field rules allow any well to be located 330 feet in from

the outer boundaries of the 80-acre spacing unit and that's the only constraint that's, as I understand it, placed by the proposed rules; doesn't matter whether it's catercornered across the 160, it's only -- the only thing they've asked is that you go in 330 feet from the outer boundary.

So either location is orthodox and I think, I'm not a geologist and I'm not an engineer, I'm a "rulerologist" and you measure the distance from a 1000-barrel well and if you're not too far from it, you're better off than if you're a half mile from it.

So to protect my correlative rights and my brothers' correlative rights, I would urge the examiner to recommend approval of TXO's location.

MR. QUINTANA: Thank you, Mr. Coll.

I'd like to take this opportunity to tell everyone that I've enjoyed the time working for the OCD. I always enjoy hearings like this. It puts a lot of pressure on me, I agree, but I sure enjoy it.

I am going to think very carefully over this, take it into all the testimony that's been presented. I've been formulating a few ideas of my own while I've been sitting here, but nonetheless, I still want to see the proposed orders, and all I can tell you is that I'm going to try and be as fair as possible to give every-

body the best shot at producing the oil that's theirs under their property.

I've enjoyed working with everybody here and this will be my last hearing. I'll do my best to get these orders out for you in a short period of time here.

Is there anything further in Case 8727?

MR. COLL: If I may just add one other thing, it was brought up that there was a mixed legal delscription and if you just deal with the 80-acre spacing unit by itself in both these applications and forget the 40-acre spacing unit, then I think the notice is completely proper and that there's no legal defect and there's nothing that should delay an immediate decision.

MR. QUINTANA: I've taken that into account and I'm glad you pointed that out. I had noticed that before.

If there is nothing further in Case 8727 or Case 8719, both of these cases will be taken under advisement.

(Hearing concluded.)

C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division (Commission) was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 8719 & 8727 held on OCT. 10, 1985.

Gilbert P. Quintana, Examiner
Oil Conservation Division