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

5 February 1986

EXAMINER HEARING

IN THE MATTER OF:

Application of Amoco Production Company for pool creation and special pool rules, Rio Arriba County, New Mexico.	CASE 8822

BEFORE: David R. Catanach, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation Division:	Jeff Taylor Legal Counsel to the Division Oil Conservation Division State Land Office Bldg. Santa Fe, New Mexico 87501
For the Applicant:	Gary L. Paulson Attorney at Law Amoco Production Company 17th & Broadway Denver, Colorado 80202
For Union Texas and Minel:	W. Thomas Kellahin Attorney at Law KELLAHIN & KELLAHIN P. O. Box 2265 Santa Fe, New Mexico 87501

I N D E X

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E X H I B I T S

E X H I B I T S CONT'D

MR. CATANACH: We'll call Case Number 8822.

MR. TAYLOR: The application of Amoco Production Company for a pool creation and special pool rules, Rio Arriba County, New Mexico.

MR. CATANACH: Are there appearances in this case?

MR. PAULSON: Yes. Gary Paulson, appearig in association with William Carr of the firm of Campbell and Black, Santa Fe, on behalf of the applicant, Amoco Production Company.

I believe that an entry of appearance from Mr. Carr should be in the file.

MR. CATANACH: Yes, I have that in the file.

MR. PAULSON: Thank you.

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

MR. KELLAHIN: Yes, Mr. Examiner. I'm Tom Kellahin, Santa Fe, New Mexico, appearing on behalf of Union Texas Petroleum Corporation.

MR. CATANACH: Are there any other appearances in this case?

MR. KELLAHIN: Mr. Examiner,

I've also been requested to make an appearance for Minel, Incorporated. M-E-N-I-L-L?

A SPECTATOR: M-I-N-E-L, Incorporated.

MR. CATANACH: Are there any other appearances in this case?

Mr. Paulson, you may proceed.

MR. CATANACH: Okay, will all the witnesses stand and be sworn at this time?

(Witnesses sworn.)

MR. PAULSON: If the Examiner please, I might just briefly introduce this matter. I think it might -- might make it a little easier to follow.

This is a request that Amoco has filed for creation of an oil pool for a four-section area for the Gallup formation in Rio Arriba County. The four sections are owned entirely by Amoco. They own 100 percent of the working interest. It in fact constitutes one lease.

We're requesting the creation of 160-acre spacig units, asking that the unit conform to the governmental quarter section, and that future wells be located no closer than 790 feet to the outer boundary and no

closer than 330 feet to the quarter quarter section line.

We're asking for appropriate exceptions for wells heretofore drilled from that -- that setback requirement, and we're requesting that a buffer be established for one-half mile surrounding this four-section area. That would be an exception from a statewide rule which I think would require that no wells be drilled near the -- or that all wells drilled within one mile must be on a 160-acre section. So we're asking that the statewide rule application be relaxed somewhat, and we'll explain why we think that's appropriate.

We're also asking for special field rules for permission to commingle the Gallup and Dakota.

We have two witnesses. We have a geologist, Mr. Rich Bottjer, who will testify first, and then Mr. Charles Boyce, who's a petroleum engineer.

We would like to begin with Mr. Bottjer, who'll present the geologic background for the application. As he'll explain, it's our opinion that production is controlled by natural fracturing that's present in the rock, and that that distinguishes production form this area and perhaps surrounding areas from some of the other nearby Gallup fields.

Mr. Boyce would then explain

the explanation in some more detail and provide the information in support of those requests.

We would like to start with Mr. Bottjer, if that's satisfactory.

MR. CATANACH: You may proceed.

MR. PAULSON: Thank you.

RICHARD JAMES BOTTJER,

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

DIRECT EXAMINATION

BY MR. PAULSON:

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

A Richard James Bottjer. B-O-T-T-J-E-R.

Q Your business address, please?

A I work for Amoco Production Company in Denver, Colorado.

Q And your occupation?

A I am a geologist.

Q Mr. Bottjer, have you ever testified as an expert in the field of petroleum geology before the New Mexico Oil Conservation Division?

A No, I have not.

Q Would you therefore give the examiner some idea as to your educational background and your work experience to the present date, please?

A I received a Bachelor in Science in geology from the State University of New York at Binghamton, 1981, and a Master in Science in geology from the University of Wyoming in 1983, and I've worked for Amoco Production Company since I left Wyoming, approximately two and a half years.

Q Are you a member of any professional societies or organizations?

A Yeah, I'm a member of AAPG, SEPM, IAS, and RMAG.

Q Mr. Bottjer, is the area of this proposed Northeast Ojito Gallup Pool in Rio Arriba County, New Mexico, within the area of your geologic study for Amoco Production Company?

A Yes, it is.

Q And have you in fact made a geologic study of that area?

A Yes.

Q And have you prepared exhibits in anticipation of testifying here today?

A Yes, I have.

Q Were those exhibits prepared by you or

under your supervision and control?

A Yes.

MR. PAULSON: Mr. Examiner, we would offer Mr. Bottjer as an expert in the field of petroleum geology.

MR. CATANACH: Mr. Bottjer is considered qualified.

MR. PAULSON: Thank you, sir.

Q Referring to what has been marked as Exhibit Number One, would you identify that document and explain its significance to this application, please?

A Exhibit Number One is a location map that illustrates where the area of interest is. The location -- the map is located in the southeastern part of the San Juan Basin. It ranges from Township 24 North up through Township 26 North, Range 2 West, west to Range 4 West.

The scale of the map is one inch equals 4000 feet. The base of the map was generated through an Amoco computer system.

The area that we're interested in having spaced is outlined in yellow tape and that would be our Jicarilla A 118 Lease, and it's a four-section block. Currently we have four producing wells and I think six or seven other wells on that lease currently. We have six more locations that are staked or permitted.

Q The acreage that Amoco has an interest in is indicated on the map in -- by stippling, is that correct?

A That is correct. We have at least some working interest in all of the acreage that's shown as stippled on this map.

Q And within the area that's bounded by the yellow tape, is Amoco's interest 100 percent of the working interest?

A To the best of my knowledge, it is.

Q Would you describe the significance of the well symbols indicated on this exhibit, please?

A The solid circles are oil wells. The open circles with the teeth on the sides on the outside are gas well symbols, the standard symbol, and open -- open circles surrounding other symbols, for example the well in the southwest quarter of Section 17, Township 25 North, Range 2 West, has a solid circle surrounded by another open circle, that indicates a dual completion, and that's a dual -- I think that's a Mesa Grande Well, it's a dual Gallup-Dakota completion.

And the open circles, such as the one in the northwest quarter of Section 1 and in Township 25 North, Range 3 West, are staked and permitted locations that have been announced in PI. Some of those have been drilled and some of those wells are testing. Some of those have been

recently completed.

Q Now would you orient the examiner with respect to other nearby Gallup -- Gallup-Dakota pools, please?

A On the west side of the map in the central part of the area of interest exists West Lindrith Gallup-Dakota spaced area and it's a designated pool. Spacing in that unit is 160-acres, and that would be in Township 25 North, Range 4 West.

North and east of that is the Ojito Gallup-Dakota area. It is currently undesignated spacing so -- but it is being developed on 160-acres.

To the southeast of our area of interest is the Gavilan Mancos Pool and that has been spaced at 320-acres and it is also a Gallup Pool, or Mancos, same thing.

Q Mr. Bottjer, does Exhibit Number One contain your opinion of the structure, the Dakota, underlying the area of interest as well as surrounding lands?

A Yes. The structure map shown here is based on tops that I've picked from well logs and the top that I used was the top of the Graneros or the base of the Greenhorn. It's one of the best markers in the San Juan Basin.

The contour interval is 50 feet and faults are shown in a double lined tape with hachures in the

middle. There are three faults shown on this map; one crossing through our lease, the Jicaralla 118 Lease, and there are two interpreted faults in the Gavilan-Mancos area.

Data points that were used to construct the map are shown as datums, subsea elevations that were picked from logs next to the appropriate well symbol.

Q Now, shown as a dotted line on Exhibit Number One is a line that's been marked A-A', running generally from the West Lindrith Gallup-Dakota northwest to the area of interest, and then southeast to the Gavilan Mancos.

What -- what does that relate to?

A That would be Exhibit Number Two. That would be a stratigraphic cross section and I'd like to point out one thing about the structure before we go to Exhibit Two.

And that is to point out that Amoco's Jicarilla 118 Lease, the lease in question here, is on the southwest side of a structural nose similar to that type of a structural nose that the Gavilan Mancos is producing on, and we think that we may have similar type fracture patterns in the Gallup.

Now Exhibit Number Two is a stratigraphic cross section that has one log from each of those four areas.

Q Would you identify the wells on Exhibit

Number Two and relate them, if you would, to Exhibit Number One and the location of each of these wells?

A Okay. The well on the left side of the cross section is the Amoco Jicarilla Apache Tribal 125 No. 4, located in Section 26 of Township 25 North, Range 4 West, and it is in the West Lindrith Gallup-Dakota Field.

A representative section of the Gallup is shown in the central part of the log. This cross section is hung on the base of the Greenhorn, the same unit that was used -- the same top that was used to make the structure map with in Exhibit One, and below that is the Dakota interval.

Perforations are shown on the Jicarilla 125 No. 4. It was fraced with a fairly large size frac in the Gallup interval and the IP was 77 barrels a day.

The second well on the cross section is a Union Texas Petroleum Well, McCorden A-4, located in Section 9, Township 25 North, Range 3 West, and it's a fairly typical well for the Ojito Pool.

Perforations and stimulation as made available are shown. Again it has a relatively large frac on it, especially in the Dakota -- in the Gallup, and the IP was 57 barrels a day from commingled zones from both the Gallup and the Dakota.

Next well on the cross section is the Amoco Jicarilla Apache A-118 No. 14. This is located in the

center of the lease in question.

Perforations are shown both in the Dakota and in the Gallup. The Dakota was tested as being nonproductive in this well, so a bridge plug was set above it.

A frac was attempted in the Gallup and it screened off before we got much sand into the formation. The IP on this well was 492 barrels a day; significantly higher than the wells that we've seen so far.

The last well on the right side of the cross section is the Gavilan No. 1. It was the discovery well for the Gavilan Mancos Field. It's located in Section 26 of Township 25 North and Range 2 West.

Perforations are shown. As you'll note on the right side of the log, the well was not fracture stimulated; had an IP of 40 barrels of oil per day. That IP is low for the Gavilan Mancos area and Jerome McHugh has recently announced some new IP's on recent wells that are in the range of 500 to 700 barrels a day.

Q Referring for a moment to the log that's shown for the Jicarilla Apache A-118 No. 14, which is the well that's actually in the proposed pool, there are a couple of red lines shown across that log. What do they indicate?

A The red lines indicate the interval that we would like to have spaced per this request. They corre-

late with the spaced interval in the Gavilan Mancos Pool.

Q And what are those depths, please?

A Those depths are 6873 to 7923 and as on the dual induction log.

Q Now, these are -- the four wells indicated on Exhibit Two all penetrated the Gallup and you're then able to correlate them across the distances shown. What can you tell us about the signature of the -- the log signature of the Gallup in those four wells and how they might differ?

A Analysis of the logs, comparing typical logs from the four different areas, illustrates that the matrix is similar in all four areas. You can look at the gamma rays, SP's, resistivity logs, porosity logs, and there are very little -- there's really very little difference from one area to the other.

The only real way you can explain the high productivity difference is through natural fracturing.

Q Do you then have an opinion as a professional petroleum geologist as to why certain of these wells indicated on Exhibit Number 2 have low IP's and other wells have higher IP's?

A We feel that the wells with the higher IP's have more natural fracturing than the other ones or that the other ones with the low IP's are not naturally fractured at all, and we have evidence in Exhibits Three and

Four for natural fracturing in the Jicarilla 118 Lease.

Q Would you then refer to Exhibits Three and Four and identify those for us?

A When we drilled the Jicarilla 118 No. 14 this past summer, we cut cores through the Gallup interval and we preserved the cores in a PVC liner so that way the chips of the core would not fall apart and it would be preserved until it was analyzed in Salt Lake City.

Now the two photographs that are Exhibits Three and Four are from that core; Exhibit Three from a depth of 7179 feet; Exhibit Four from a depth of 7514.

You'll note on Exhibit Three that a fracture that runs about a foot and a half through the core is shown. The fracture is natural because there is some calcite fill that you can see on the sides of the fracture. It's probably induced to be open to this extent but it is only partially calcite filled, therefore we feel like the fracture is open in the subsurface.

For a further example of what some of the calcite fill looks like on these fractures, the Exhibit Four shows it very nicely. That's a chip that's come off of that fracture and you an see calcite fill on there, so that is a natural fracture, as well.

Q Could you relate these findings to what Amoco has found in nearby Dakota-Gallup pools, specifically

West Lindrith and Gavilan Mancos?

A We have examined some cores from the West Lindrith area that we cut in the Gallup formation, some internal reports indicate that there is no natural fracturing in the Gallup in West Lindrith.

Q Now, as I understand your testimony, you're indicating that the IP's for wells immediately to the south, certain areas immediately to the south of the area of interest, have much, much lower IP's than the wells within the area of interest, and your explanation, then, is natural fracturing?

A That is correct.

Q Is it your professional opinion that the mechanism for production is through natural fracturing?

A That is correct.

Q And that would explain why even though the log signatures look similar across the area, that certain IP's are considerably higher than others?

A That is correct.

Q Based upon your geologic studies and your review of the data, do you have an opinion as to whether 160-acre spacing is appropriate for the area of interest?

A Yes. I feel that 160-acre spacing would be the most appropriate spacing for efficient drainage of this reservoir.

Q And do you have an opinion as to whether certain wells outside the designated area within the buffer might experience the same type of production mechanism as is present within the area of interest?

A Yes, I feel that the fracturing should exist in similar areas outside of our lease. The fracturing is certainly not going to be localized just on our lease, and there should be other good wells drilled eventually surrounding the lease.

Q Is it your feeling and your opinion, then, that the creation of a buffer where wells outside the area of interest would have to be drilled on a similar pattern is necessary to protect correlative rights and prevent waste by the drilling of unnecessary wells?

A Yes, I do.

Q Is it your opinion that the granting of this application is in fact necessary to prevent waste by the drilling of unnecessary wells and to protect the correlative rights of the parties involved?

A Yes, I do.

MR. PAULSON: If the Examiner please, we would have nothing further.

We would offer Exhibits One through Four and tender this witness for cross examination.

MR. CATANACH: Exhibits One

Through Four will be admitted into evidence.

Mr. Kellahin, your witness.

MR. KELLAHIN: Thank you, Mr. Catanach.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q Mr. Bottjer, if you'll turn to your Exhibit Number One --

A Okay.

Q -- you've identified for us on Exhibit Number One an area shown as the Ojito Gallup-Dakota Pool. Do you recall when that was established by the Division as a pool for those formations?

A I do not. That's an engineering question and that could probably better be answered by people that would be testifying later.

Q Do you know that the Ojito Gallup-Dakota Pool has been established based upon the statewide 40-acre spacing --

A As far as I --

Q -- for that pool?

A Yeah, it is currently under 40-acre spacing, that is correct.

Q The area you've outlined as the Amoco

Jicarilla Lease acreage --

A Uh-huh.

Q -- were those wells drilled subject to the Ojito Gallup-Dakota rules?

A Again, that would be a question that would be for people that will be testifying later.

Q Is that lease acreage of Amoco currently in the Ojito Gallup-Dakota Pool?

A I do not know. Again that's something that you should probably ask the people that will be testifying later.

Q You've shown within the section a number of wells, and I've lost track of -- they're not identified for me. If --

A Okay.

Q If you can, sir, let's start up in the northeast corner of the four-section block.

A Okay.

Q And if you'll put a number on the Dakota-Gallup wells that Amoco has.

A Okay. The three open circles in Section 25, I do not recall the numbers off the top of my head.

Q 25 is the one in the northeast of the four?

A Right.

Q There is a well in the --

A The well in the southeast quarter is the No. 15.

Q That's the 15.

A Yes.

Q Okay, what was the initial potential on the No. 15?

A That well is currently testing. I don't think -- that will be offered as evidence later, I believe, but I'm not sure if we have an IP on that yet.

Q Okay. We go into the section to the west and that is Section 26?

A Correct.

Q All right. Let's look in Unit Letter A. What's the number for that well?

A That is a Pictured Cliffs oil well. It was drilled in the last 1950's by Honolulu Oil Company. It's a Dakota penetration but it's not producing from the Gallup at this time.

Q The next one there in the northwest quarter?

A That would be the No. 16.

Q That's the 16, and what's the IP on that well?

A That will be offered as later -- on a

later exhibit.

Q All right, what -- the next one's just a location and then in the southwest of Section 26 at -729?

A In the southeast quarter of Section 26?

Q I'm sorry, yes.

A Yeah, that's the No. 17.

Q The No. 17, and do you know what the IP is on that one?

A Again the IP will be located on a -- it will be listed on a later exhibit.

Q All right, now let's go down into Section 35, is it?

A Yeah. The well in the northwest quarter of Section 35 is the No. 13.

Q The 13, that's at -736?

A Correct.

Q That's No. 13.

A The well in the northeast quarter at '734 is the No. 10.

Q Okay.

A The oil well in the southwest quarter of that section at -769 is the No. 9.

Q Okay.

A The southeast, the oil well in the southeast quarter of that section at -732 is the No. 8, and

that's the original well that we drilled on that lease.

Q Okay.

A In Section 36, the well in the northwest quarter is the No. 14. That's the one shown on the cross section.

The well in the southeast quarter of that section is the No. 19 and that's at -708.

And the well in the southwest quarter of Section 36 is the No. 11. That's also at -708.

The IP's for all those wells will be offered on a later exhibit or when Mr. Boyce testifies.

Q When we look at Section 25, you've shown from the northwest to the southwest -- southeast a fault line.

A Okay.

Q All right? Does that fault line isolate off the Dakota and the Gallup northeast from the southwest in that Section?

A The amount of throw on the fault is probably not sufficient to completely isolate the Gallup reservoir across the two -- across the opposite sides of the fault. The Gallup is thick enough that the -- now, the Dakota may be offset on that fault, and the Dakota may be isolated, and we, in fact, have gotten better tests out of the No. 15 in the northeast up-thrown side of the fault than we

have out of most of those other wells.

Q I assume, then, as a geologist you're satisfied that within those four sections you're dealing with a common reservoir in the Dakota and Gallup and the fault line doesn't break it into two reservoirs.

A With the Gallup that is correct.

With the Dakota, it may.

Q All right.

A The significant thing about that fault with the Gallup is that fracturing will be increased around that fault.

Q In looking at the structure map as we move to the south into the area that would remain in the Ojito Gallup-Dakota Pool, the structural mapping shows that there shouldn't be any structural evidence or feature to structurally separate your four sections from the rest of the pool. Is that true?

A We feel like this structural nose on the northeast side of that lease is what's controlling the fracturing on that lease.

There is no such nose in the Ojito area.

Q All right. But in mapping the structure you haven't isolated those four sections as part of a structure separate and distinct from the structure in the Ojito Gallup-Dakota to the south and to the west.

A That is correct. What makes it distinct is that there is no structure there at all.

Q All right.

A In looking at the line of cross section, have you constructed any other cross sections combining wells from the proposed new pool with wells in the Ojito Gallup-Dakota Pool, other than the one you've shown today?

A We have, yes.

Q Do they show you anything different in terms of establishing your four sections as a separate -- geologically separated from the rest of the pool?

A Geologically, based on a stratigraphic cross section and log evaluation, you cannot distinguish between the Gallup reservoir in one area and another.

Q Based upon all your studies and whatever work you've done in examining this area, do you -- can you conclude as a geologist that the four sections you're dealing with here constitute a separate and distinct source of supply from the balance of the Ojito Gallup-Dakota Pool?

A Could you please rephrase the words -- phrase "source of supply"?

Q Yes, sir. Are we dealing with a common reservoir in your four sections that is geologically separated from the rest of the Ojito Gallup-Dakota Pool?

A No, I don't think we are.

Q Let's look at the line that runs east and west that separates the south end of your proposed pool from the north end of the existing pool, if you'll look at that yellow line for me.

A Uh-huh.

Q Between the existing wells that you have on that tier just north of the line and the geologic evidence that you have seen just south of that line, do you see a separate and distinct reservoir or are we dealing with the same reservoir in the Gallup and Dakota?

A What we see is a zone of increased fracturing approximately a mile wide around that fault based on production rates.

Q Do you have wells in this four-section area operated by Amoco that have not cut the fault like the, what was that, No. 14 Well?

MR. PAULSON: I'll object to the question. There's been no indication that that well cut a fault.

That was not the testimony and I'll object to the form of the question.

Q You said that the No. 14 Well, the explanation for the high IP on that well was in your opinion that the production was aided by being in communication with a fault or fracture system.

A Well, it's due to natural fracturing.

Q Fracturing. All right.

A Correct.

Q All right. Of the other wells that Amoco has in the section, can you attribute the high producing rates to the natural fracturing in those wells?

A Yes.

Q Do you have also wells in your four-section area that are lower IP wells that have not in fact encountered the natural fracturing system?

A We do have two wells with lower IP's and that will be submitted as later exhibits.

Q What I want to make clear to me --

A Uh-huh.

Q -- is that the proposed area is not inclusive of simply high IP wells that have encountered the natural fracture. There are wells in that area that have not encountered the natural fracture.

A We do have indications that there are natural fracturing in wells with low IP's as well, and there may be some type of a completion related problem to that, to cause the lower IP, also.

Q Have you made an investigation of the wells in the Ojito Gallup-Dakota to the south and west to see if you can find evidence of high IP wells down there,

the production from which you would attribute to having encountered the natural fracture system of the Gallup-Dakota?

A We have seen very little in the way of high IP's, at least as compared as to what we see in, say, the 118-14.

Q You said the spacing in the West Lindrith Gallup-Dakota was on 160-acre?

A I believe that is correct.

Q Are you familiar with what the Division and the operators are doing in terms of this one mile, or half mile buffer that you proposed for your pool, what they have done with the West Lindrith Gallup-Dakota and the Ojito Pool?

A No, please familiarlize me with that.

Q It was a question. I don't know. Do you know?

A Okay. Our next subject, testifier would know that.

Q All right.

MR. KELLAHIN: That concludes my examination of this witness. Thank you.

MR. CATANACH: Mr. Paulson, do you have any other questions?

MR. PAULSON: I did have a couple, please, but would you prefer to ask before I do or

would you rather --

MR. CATANACH: Why don't you go ahead.

MR. PAULSON: Okay, I just have a couple.

REDIRECT EXAMINATION

BY MR. PAULSON:

Q There was a question addressed concerning the Ojito Gallup to the south and the question was whether it's been drilled on statewide 40's. I think your response was yes.

In terms of the pattern that's developed there are the wells drilled on 160's basically or on 40's?

A The wells are basically drilled on 160's, even though it is governed by 40-acre regs, but economically, I believe, it is not profitable to drill at less than 160's.

Q Okay, and a question was addressed to you concerning structure, several questions about structure. Is it your opinion that structure determines whether a well will be highly productive or marginally productive in the Gallup in this area?

A Yes, it is.

Q And a question was asked whether the --

the area in question was geologically separate from Gallup that you find elsewhere, and I think your response was no, it's not geologically separate.

My question to you is, is there a geological distinction that you find that would explain the higher productive, higher rates of production from some areas than others?

A Yeah. Structurally the Jicarilla 118 Lease is different from the Ojito area, based on that structural nose.

Stratigraphically the Gallup reservoir is comparable in the two areas.

Q And this was illustrated on Exhibit Two by the fact that you can't really distinguish the Gallup as you move across the area and yet you experience sharp distinctions in the rates of production, is that correct?

A That is correct.

MR. PAULSON: No further questions, Mr. Examiner.

CROSS EXAMINATION

BY MR. CATANACH:

Q Mr. Bottjer, on your Exhibit Number One --

A Uh-huh.

Q -- you don't have marked the boundaries of the Ojito Gallup-Dakota Pool, or do you?

A I don't have the exact boundaries of the pool marked.

Q Do you by any chance know what that northern boundary would be for that pool?

A Honestly, I do not. Mr. Boyce would probably have that information.

Q Okay, for clarification, I just want to be sure that I understand the vertical limits you proposed for the new Gallup pool would be 6873 to 7920, is that correct?

A Correct, on a dual induction log in the Jicarilla A-118 No. 14, as shown on the cross section.

Q Mr. Bottjer, I'm not quite sure I understand why you -- why Amoco is requesting the one-half mile buffer as opposed to the one-mile buffer.

A I think further testimony might give a better idea.

Q All right. I have no further questions at this time.

MR. PAULSON: Call Mr. Charles Boyce at this time.

CHARLES BOYCE,

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

DIRECT EXAMINATION

BY MR. PAULSON:

Q State your name for the record, please.

A My name is Charles Boyce, B-O-Y-C-E.

Q And your business address?

A Is Amoco Production Company, P. O. Box 800, Denver, Colorado 80201.

Q And your occupation?

A Petroleum Engineer.

Q You're employed by Amoco?

A Correct.

Q And have you previously testified as an expert in petroleum engineering before the New Mexico Oil Conservation Division?

A Yes, I have.

Q And have you made an engineering study of the area of the proposed Northeast Ojito Gallup Pool?

A Yes, I have.

Q And have you prepared exhibits in anticipation of testifying here today?

A Yes.

Q And those exhibits were prepared by you or under your supervision and control?

A That's correct.

MR. PAULSON: Mr. Examiner, we'd offer Mr. Boyce as an expert in the field of petroleum engineering.

MR. CATANACH: Mr. Kellahin, any objection?

MR. KELLAHIN: No objection.

MR. CATANACH: Mr. Boyce is considered qualified.

MR. PAULSON: Thank you.

Q Mr. Boyce, what does Amoco seek by its application in this cause?

A As a result of the drilling and completions quite recently of ten wells in the four-section area we've delineated, we're requesting that this area be spaced based on the facts that we have and I shall discuss, we believe that 160 acres in this immediate area and any immediate adjacent areas that may -- may be proven to be in this same pool, be spaced on 160 acres.

Q And with respect to a setback?

A We are recommending for this 160-acre spacing that the well be located no nearer than 790 to the outer boundary of the spacing unit or nearer than 330 to a

governmental quarter quarter section.

I think is common spacing for 160-acre oil development, not in West Lindrith, which is many years old. I think with the fracture reservoir that we have, and with the potential for drainage, that a reasonable distance between wells is necessary to prevent crowding of wells. The 790 from the 160 will allow that and it will also allow a reasonable area within the 160 for an operator to locate wells considering the terrain in this area and hopefully minimize some exceptional cases.

Q Would you explain the request for the buffer of one-half mile, please?

A Under present statewide rules, 104-A, any well drilled within a mile of a defined pool is a development well. That -- that well must be spaced, drilled, operated, and produced in accordance with those rules.

We're in a rather unique situation here even though the Gallup is a blanket zone that covers much of the San Juan Basin, we can see in this specific area that we've got unique areas of high productivity, and I think high drainage capability, that are reflected or related to fracturing.

We've already seen in our area that that fracturing area can change very rapidly. It was our feeling that a one-mile buffer would be perhaps too much to require

operators to space on this basis, that they step-out somewhat less than a mile, find they're not in this pool, they perhaps shouldn't be spaced on that basis.

Q And how would one determine whether they were in fact in this same pool on the basis of the evidence that we have?

A Well, that's -- that's a matter of, I think, as we've seen, primarily geologic interpretation and reflected in high initial productivities, which is indicative of a highly fractured reservoir.

It's -- it's difficult to predict within a precise range. That's really why we selected these four sections. Within that area we have drilled wells. We do have initial potentials. We do have some production, and the -- the geologic nose that we described seems to fit that general type area. We could have expanded it perhaps a half a mile in either direction. We chose not to. We feel like it's best proven by additional development.

Q Do you have an opinion as to whether the establishment of a half mile buffer is necessary to prevent waste by the drilling of unnecessary wells and protect correlative rights?

A I believe it is, and it's again a unique situation. If we look just to the east of our four-section area there is a strip of sections that are a little more

than 40 acres wide, due to a survey correction at this point.

Unlike the area to the west in Ojito, which, even though it's been spaced statewide 40's, obviously hasn't been drilled on 40's.

Several reasons for that. One, the productivity of the wells. They were not of sufficient initial capacity and ultimate recovery to encourage widespread development on 40's.

Secondly, the leases in the general area to the west and southwest in Ojito are fairly large leases, 160's and 320's are not uncommon. For that reason operators were not forced to drill on smaller tracts.

If we look at this vertical line of sections, it's on the west side of Township 25 North, and 26 North, 2 West, this map does not fully indicate the lease breakdown but many of these are 40-acre tracts. There are some smaller tracts in Section 1, directly to the south of our proposed area.

With the potential that we have seen on our recent development, if there isn't some type of a buffer zone there, operators in that area, and this includes Amoco, we have a 40-acre tract in Section 6 of Township 25 North, Range 2 West, development without some spacing buffer will have to proceed on 40's for lease protection and drainage

protection, and in -- in discussing our proposal for the area with -- with the Commission's representatives in the Aztec District, this particular point was -- was quite evident to all of us.

It's also a problem to the west of the Gavilan Mancos Pool, and it's one that needs to be faced. We can't solve it now but I believe our one-half mile buffer immediately adjacent to areas that we feel will be in our pool will -- will protect the rights of these owners and not-- not infringe on their rights.

Q Does that include the area to the south as well as to the west and --

A The area to the south that is currently undeveloped and unproven. The -- let's look specifically at Section 1 of 25 North, 3 West.

We show in the -- in the northwest quarter of that section a location. This well has been drilled by Minel, Incorporated. I don't believe it has been finally completed. It is being tested and I'm not aware of the potential of that well.

That -- that production, I think, may be critical to -- to defining the limit of the reservoir to the south; however, we see that as we move closer to the -- the faulted area and to the more steeply dipping nose, fracturing can change quite rapidly.

I think during -- during the testimony by Mr. Bottjer the -- the Well No. 9, or pardon me, No. -- let's see, which one is that --

MR. BOTTJER: Eight would be the --

A That would be No. 8 in the southeast quarter of 35 within our block, was -- is producing, as I'll show on a later exhibit, approximately 42 barrels a day.

That, the direct east offset in the southwest quarter of 36 is currently producing 192 barrels a day.

From the initial tests and the three months production of these wells, which we'll show later, there is a marked difference in -- in the extent of fracturing just in those two offsets; therefore in addressing the area to the south, since it is undeveloped and I see no reason for drawing a demarcation line of no fracturing to the south, we have to assume that that's potentially in the field.

So I believe that the half mile buffer is appropriate throughout the area.

Q Even though that would prohibit Amoco from drilling a 40-acre tract just to the south and east of the designated area.

A That's correct. It -- I don't think it

would prevent us from drilling a well. It would keep us from drilling a well which I believe would be unnecessary, were it not spaced on 160's and joined with other nearby parties.

Q You're not requesting that the Dakota be spaced within this area?

A No, I'm not. The -- the Dakota-Gallup common zones are defined in the Ojito Gallup-Dakota.

Within the area that we have developed we see very minimal Dakota potential and we have -- we do not have enough information on the Dakota to recommend spacing.

We therefore recommend only that the Gallup be spaced. In those wells where an operator wishes to test the Dakota, I would recommend that they continue to be allowed to commingle the two horizons as they are now.

In answer to a previous question, the -- as far as the limits of the Ojito Gallup-Dakota Pool, our four sections are in the Ojito Gallup-Dakota Pool. We could have drilled these wells on 40-acre spacing. As with the other operators in the Ojito Gallup area, we have developed it on 160's, which I think in this particular area, we feel is proper.

Q Okay. Referring then to Exhibit Five, would you identify that document and explain its significance to the application, please?

A Yes. Exhibit Five is a summary of some pertinent completion and production data on the wells that have been drilled and completed within the four-section A-118 Lease.

We've listed the wells, the location, the completion date, the various perforations. You'll note that we only have four of these wells actually on production. We've, even though the first one, No. 18, was completed nearly a year and a half ago, we have encountered substantial delays in pipeline connection of casinghead gas in this area and for that reason we've been unable to produce as we would like to.

Let's look at the individual wells that are of interest.

I've previously mentioned Well No. 8 in the southeast of Section 35. Its current production is 42 barrels per day.

No. 9, again I previously mentioned. It's in the southwest quarter of Section 35; current production of 17 barrels a day.

These two wells are more comparable to the typical well that we have seen in the past in West Lindrith and -- and in Ojito. Although quite, quite interestingly, we did not core No. 9. We did at the time the well was drilled, before casing was run, run a borehole tele-

viewer in the hole. This is a downhole camera to look at the sides of the drilled hole to look for fractures.

We -- we did see fractures in this well. The extent of them, of course, is limited by that one wellbore, and so I think that tells us something, that there may be fracturing in all of the Gallup in here. I think there perhaps is to some extent. We can't quantify fracturing. In that particular well we saw some; they are not contributing substantially to production. In the well a half mile to the east, they certainly are.

The Nos. 10 and 11, 10 in the northeast of 35 and No. 11 in the southwest of 36, are also on production. Their current rates shown as 277 barrels a day and 192 barrels a day.

The -- the remaining wells on that page, we have not completed yet. They're not on full time production, but the IP's indicate obvious high levels of natural fracturing; 223 a day for No. 13; 492 a day for No. 14, 304 a day for No. 16.

I think one thing of note on No. 14, and this was shown, I believe, on the cross section, that -- that well was fraced in the Gallup; however, it's shown after only 35,000 pounds had been injected, the frac sanded out; we were unable to inject any more.

Typically Gallup wells in this area are

given large volume fracs. This one basically wasn't, and yet it's a 490-barrel well, so we do have high level of fractures which do not require any stimulation.

The remaining three wells on the second page, again we have not completed them. We have shown for the information of those present the initial tests on the wells.

Again, in each case a reasonably high potential.

One thing of note in this area, and I mention this because it was -- it was mentioned specifically in the hearings relating to Gavilan Mancos, which has been temporarily spaced on 320. Mention was made of substantial lost circulation during the drilling of those wells. This is generally related to natural fracturing and it's an indication of it and it supports there is some.

We, in the wells that we have drilled in our area have seen very minimal lost circulation. Now, granted we were aware that that was a possibility and we attempted to drill with mud systems that would minimize it, but the fact that we didn't really encounter any serious problems leads me to believe that we perhaps don't have the extent of fracturing in our little nose here, as you might call it, that -- that the operators encountered in Gavilan.

Again it's -- it's a relative matter but

with fractured reservoirs we have to deal in relative facts, not positive facts.

Q Exhibit Five also indicates the fact that Dakota production in this area is quite poor, does it not?

A That's correct. We did -- we did -- we did test two or three wells, some marginal, some nonproductive, and on one of our wells, No. 17. we didn't open Dakota.

It is of marginal production in great areas but we saw no information that would lead us to space it at this time.

Q And Exhibit Five indicates that the four wells that are on production were not brought on production until in some cases a year after -- after the wells were completed and that's because of a lack of market?

A That's correct, yes, and with only three months production we don't have all we'd like but that's why we came ot the hearing now, we feel it's necessary to space an area like this that's under active development.

Q Referring then to Exhibits Six, Seven, Eight, and Nine, would you describe those exhibits, please?

A These are production curves of the production through December of the four wells we do have on line and I'll just briefly mention any -- any things of significance.

On -- on 118 No. 8, which is Exhibit Six, the last production shown in December was approximately 47-48 barrels a day.

The current rates shown on Exhibit Number Five were for the week ending January 24th. Now as you can see that well, a month after the last point on the curve is a 42-barrel a day well.

Enough. That's basically all we see on that exhibit.

No. 9, again the last production shown in December was approximately 18 barrels of oil a day.

Q Excuse me, Mr. Boyce, you said No. 9. You meant Exhibit Number Seven, Well No. 9.

A That is correct, I'm sorry.

Q Okay.

A Yeah, Well No. 9, Exhibit Seven, and the most recent we have is 17 barrels a day. We can see indications of a relatively low producing well; looks like it may reasonably stabilize in another month or two at between 10 and 20 barrels a day; somewhat comparable to many other typical wells to the southwest in the Ojito Gallup-Dakota Pool.

Exhibit Number Eight is a plot of the production on the Jicarilla 118 No. 10, which is in the northeast quarter of Section 35. The latest test on that

well was 277 barrels a day; approximately what it averaged during the month of December.

Here we have a well that's capable of producing 8-to-10,000 barrels a month. The one interesting thing to note here, the production on this well was terminated December 24th. The well was overproduced.

One obvious problem in this area, in Ojito Gallup-Dakota were we not to space it, the 40-acre spacing dictates 142 barrels a day top allowable. These -- these wells, as with many of the initial wells completed in the Gavilan Mancos Pool, it's also a fractured Gallup reservoir, are capable of far above this and I have not seen any evidence in the wells that I've analyzed in this area that higher producing rates within the capability of the lift equipment installed or the wells to flow, would create any reservoir damage. Therefore, these wells are severely penalized in the time when we, as an operator, and I think as a joint operator under the company (sic), need to develop our oil reserves and not be restricted.

We -- we did have the option of coming before the Commission and requesting an allowable exception but we believe that spacing to prevent excessive drilling is also necessary so that's not a part of our application. It would be automatic if 160 allowables are -- or 160 spacing is granted, the top allowable would be 382 barrels a day,

and I'm not offering any facts to support why 142 is relevant or 382 are relevant. They're really not, but it's a fact of life we must face.

The No. 11 Well, the latest rate, as shown from Exhibit Five is 192 barrels a day. Again it's capable of producing, I think, 6-to-8,000 barrels per month.

Q Now, Exhibits Five -- I'm sorry, Six, Seven, Eight, and Nine are in fact production curves on the southernmost tier of wells within the area of interst, is that correct?

A Well, they're the ones we have on production. That's basically it. Oh, pardon me, did I misunderstand you?

Q These --

A You were referring to these exhibits.

Q That's correct.

A Okay, uh-huh.

Q And I might point out there's a different scale on the first -- on Exhibits Six and Seven than there is on Eight and Nine.

A That's correct, its due to the lower potential of the wells. The first two are on a zero to 100 scale -- or to 100 barrel max; the others are 500 barrel maximum.

Q So that Exhibits Six and Seven relate to

two wells that have rates of production that are kind of equivalent to Ojito Gallup to the south and the other two are more indicative of this pool, is that correct?

A That's correct, yes.

Q Referring then to Exhibit Ten, please.

A Exhibit Ten was -- shows the production history of ten wells in the Ojito Gallup-Dakota Pool. These are not all of the wells in Ojito Gallup. I've selected ten wells that have been on production at least two years, so there was some performance history.

As shown here, the -- this is the cumulative production through January of 1985. It averages a little over 15,000 barrels of oil per well.

During 1984 those wells averaged approximately 12 barrels per day.

The decline rates on those wells are very minimal. They're less than 10 percent a year. I think in the many, many wells that I have analyzed in Lindrith and in Ojito over many years, these are, I think, somewhat representative of a typical Lindrith well during this early stage of production.

Based on the minimal decline rates and the many, many, many more years of production, I believe we're perhaps looking at ultimate recovery from these wells of 40-to-50,000 barrels. A range of 40,000 barrels ultimate

is typical for a West Lindrith well in the area shown on the map, which has been drilled for as many as 20 years on -- on 160-acre spacing.

This, I think, points out the -- the unique character of some of our new completions in the area we've recommended for spacing. As I've indicated, at least two of our wells are capable of producing 6-to-10,000 barrels per month at their present rates. They've been on such a short time they haven't declined.

We're obviously going to see cumulatives far in excess of these.

In West Lindrith spacing has been on 160 acres for many years and the operators have developed on 160's.

In Ojito, even though it's not spaced, the operators have developed them on 160's.

If indeed the wells in the 40-and-50,000 barrel range are indicative of recoveries in these relatively poor areas, I see no reason why we shouldn't produce twice or many times more than that from these better fractured wells in our area.

Q And then to Exhibit Eleven, please.

A Number Eleven is, keeping in mind that any economic analysis these days is quite subject to fright because of the rapidly changing oil and gas prices, but we

have used in this case typical economics for a well that we would drill in this pool and that we feel would be probably drilled within that half mile buffer.

We've used the cost of $650,000 for a well. That's a best average of the wells that we have drilled. The mud cost contributes significantly into this. We've indicated no sales delay, which, of course, affects overall economics. We've used a beginning oil price of $20 a barrel, which I think this week would be representative, and the oil that we're currently selling in this area, I think is perhaps a dollar above that, but that was two days ago.

The oil price is representative of the price that we are receiving in this area. I can't vouch for the contracts of other operators but I think for new wells drilled on new leases for new commitments to sales, this -- this would be, I think, fairly representative.

These -- these economics are considerably more pessimistic than were used in the Gavilan Mancos Pool when -- when the evidence was presented for 320-acre spacing there, I believe they, two years ago, using $29 oil and $4.50 gas.

So economics are an important factor in determining what the proper spacing is.

The two runs I've shown here, one for

perhaps a more typical lower productive well that really isn't affected by massive fracturing, I've given 40,000 barrels of oil, 160-million cubic feet. As can be seen by normally accepted economic determinations, it would be marginal at best.

There is an undiscounted ROI of .6 so without discounting there is some minimal profit.

The lower case I've shown, I think is more repreentative of a case that we could anticipate in a fractured area of 80,000 barrels and 320-million cubic feet, showing economics that are acceptable, and I think supports the fact that with -- with widespread fracturing in the area we've defined, which characteristically of a fractured reservoir, drainage can be wider than an unfractured area, we can justify economic development on 160's and I believe development on a more dense spacing would -- would result in the drilling of unnecessary wells that would counter-drain.

Q And based upon your analysis of the economics involved and the production data and other data available, what is your opinion and recommendation with respect to spacing in the area?

A My opinion from correlating the initial production and the evidence of fracturing in our four-section area, with older pools to the west, with newer developing pools to the east, that -- that the present 160-acre

pattern that we are following is -- is appropriate, and I therefore recommend that this -- this four-section area, as we have defined by drilling and by geologic interpretation be spaced on 160-acre.

Q And do you have an opinion, based upon your analysis of the data as to whether operators within the half mile proposed buffer might also encounter conditions that are present and exhibited on Exhibits Eight and Nine?

A I would -- I would certainly anticipate it and I hope they do, because we do have a 40-acre tract immediately to the southeast and we see no specific limitation of the fractured area within that half mile range.

Q Do you have a request with respect to the effective date of this -- of this order in the event the Division sees fit to grant the application?

A If the -- if the evidence we present today is accepted as supporting 160-acre spacing, and the allowable of 382 barrels per day, which would be coincident with that, it's my recomendation that the allowable portion of that order be retroactive to today and not to some future date that the order is written.

Q Okay.

A I feel it would severely penalize us for no reason, considering our pattern and the pattern of offset wells.

Q Now, it's my understanding that Union of Texas has a request that the buffer should be diminished somewhat. Do you have a recommendation with respect to the drilling of a well and the request for an exception as opposed to a change in the buffer?

A The, I believe the area you're referring to perhaps is the northeast quarter of Section 1. In discussing with Union Texas, the specific lease breakdown is not shown here, there was an indication that Minel, Incorporated, had permitted a well in the northeast quarter of that section.

The Commission here doesn't have a record of that, but that would be the case. I believe Union Texas' concern was that if Minel did drill a well on their lease in the northeast quarter, under our spacing pattern then would not have the right to drill a well on their -- on their 40-acre lease.

Well, really that's the whole purpose of conservation, and under the testimony that we're presenting, that if indeed one well is capable of draining 160 acres, the operators within a 160 should pool their interest and drill one well and not drill as many wells as there are leases, and it's a problem related to this entire east area. We have many 40-acre tracts and that leads to crowding of wells which is wasteful, and as I indicated, I'm not aware

of what the potential of Minel's well is in the northewest of this section. That might tell a lot about what the fracturing is in here and what the potential is, but until a well is drilled in the northeast, we won't know if it's in the pool or not, and I believe it should be spaced on the same pattern as the pool if you accept our testimony.

Q Lastly, would you refer to Exhibit Twelve and briefly identify that document, please?

A Okay. One, one last thing, Gary, before we leave that last comment, if -- if a well is drilled in the -- let's say the northeast quarter of 1, it would be typical of any 160 within the buffer area, if the parties in the160 join in a well, if that first well is of such potential that they wish to drill a second well, all that's required is to come before this Commission and request an exception and if the facts show that it would be an equitable situation to drill two wells, they can drill it.

So what we're recommending does not prevent anyone from drilling a well that's supported by -- by the facts in hand at that time.

It prevents the drilling of unnecessary wells before the fact.

Q Okay, and Exhibit Twelve, then.

A Exhibit -- Exhibit Twelve is just a written summary of the parties.

MR. CATANACH: Mr. Paulson, we don't have copies of the exhibit.

MR. PAULSON: I'm sorry.

A This basically lists the parties to whom we sent notice by mail of this hearing.

MR. PAULSON: For the record, this is an attempt to conform to the recent request of the Division and I spoke with Mr. Taylor and the suggestion was that something like this be prepared and submitted, so we've done it.

Q Mr. Boyce, in your opinion as an expert in the field of petroleum engineering, will the granting of this application prevent waste and protect correlative rights of parties?

A I believe it will.

MR. PAULSON: If the Examiner please, we would offer Exhibits Five through Twelve and tender Mr. Boyce for cross examination.

MR. CATANACH: Exhibits Five through Twelve will be admitted as evidence.

CROSS EXAMINATION

BY MR. KELLAHIN:

Q Mr. Boyce, you've had considerable experience before the Commission reviewing spacing cases and tes-

tifying here, particularly in this area of the Gavilan Gallup Mancos in the recent years, haven't you, sir?

A Yes. I've not actually testified. I've attended those hearings and I've read much of the testimony; I'm quite familiar with the area.

Q You're familiar with the general concepts for the creation of a new pool and the determination of what the appropriate spacing would be as applied by the Commission.

A I -- I think so, yes.

Q All right. When we look at Exhibit Number One it's simply a reference guide for us, Mr. Boyce, can you tell me in terms of the Gallup, is there anything significant occurring up to the north and west on the exhibit?

Is this a Gallup pool up to the north and west?

A From -- from this map there's nothing -- are you talking about geologically appearing?

Q No, sir, I'm just trying to identify these wells. Are these Gallup wells?

A These are indicated to be gas wells and I'm not aware of a specific pool up in that area.

Q All right.

A There may be.

Q To reference us as to where we are, we

are on the eastern edge of the West Lindrith Gallup-Dakota on the exhibit?

A Yes, that's correct.

Q And the shaded area represents acreage in which Amoco has an interest, I believe?

A Yes.

Q Okay. The development in the West Lindrith historically has been on 160-acre spacing, hasn't it?

A Eventually leading to that, yes. I think that it was perhaps drilled on some more wide spacing, but most of the leases in -- that are developed in the area that we show to the west are on a voluntary 160, you might say.

Q Within the Ojito Gallup-Dakota itself, based upon your background and all the years that you've devoted to this kind of problem, Mr. Boyce, what would you consider to be the most appropriate spacing for the Ojito Gallup-Dakota Pool itself?

A We -- we looked at that when we determined that we had a unique area here, and our first inclination, since -- since our four sections were a part of the Ojito Gallup Pool, to space the Ojito Gallup Pool on 160's.

I don't have any specific evidence of what the probably drainage of the older wells will be in Ojito. We do, I think, by correlation with Lindrith, could possibly say 160 development in there would be proper.

Q This Ojito -- excuse me, I was going to ask you, the Ojito Pool was established in June of '72, is that right?

A I believe it was, yes, uh-huh. It was, I think, an updating of the original Ojito Dakota Pool, and as far as the spacing proper in the Ojito Gallup-Dakota Pool, I really am not prepared to say what it should be. Obviously, the operators themselves have -- and that includes Amoco, we have -- we have leases in Ojito, which we recently drilled -- we determined from the -- from the economic standpoint, I think, primarily, that development on less than 160's would not be proper or we would have. I certainly don't believe 40's, as such, would be proper.

So something higher than 40's, possibly 160's; however, since none of the operators in the pool, including Amoco, has ever made any moves to space it, maybe that answers the question itself. The facts aren't really available to space it.

Q Don't you think it would make practical sense to consider the entire area of the Ojito Gallup-Dakota in terms of a case called before the Division to decide if it ought to have its own special rules on spacing rather than simply take four sections out of one end and give it a different spacing pattern in the rest of what everyoe acknowledges is the same reservoir?

A No, I really don't. If I believed that, we would have recommended it, and I think we've got a kind of a unique concept here of what a reservoir is. Obviously, the Gallup and/or the Mancos as it's referred to, is a common source of supply. It's unique in that the reservoir itself has extremely low matrix porosity and extremely low matrix permeability.

Fracturing is what creates better quality rock that's capable of draining wider areas, and with that in mind, I think we'd probably be remiss in trying to space the entire Gallup-Dakota. Much of it really defies spacing.

Other than those reasons where for geologic reasons or production reasons either an operator or a group of operators see something unique they can quantify it and try to space it on what they think is proper.

In Ojito I don't see that need right now and it may eventually come but I don't think it's related to our recommendation or we would have -- would have tried to incorporate it.

Q Don't you find wells in the Ojito Gallup-Dakota that is not to be respaced, don't you find wells in there with initial potentials that approximate the better initial potentials that you've seen in your four-section area?

A Looking at the production curve in that

area, very few, if any, in the three to five to excess ranges, such as that, that sustain those rates for along enough period to recover any substantial reserves.

Any -- any well that is given an extremely large fracture treatment, if it does have productive potential, can be reported as a high initial producing rate, depending on the time that the rate is measured.

I think the critical thing is to look at the long term and see if those high potentials retain themselves, which would mean they -- they related the inner well fracture, natural fracturing, rather than that one, large, initial hydraulic fracture.

So I wouldn't be surprised if there were some fairly high initial potentials. I'm not aware of any and I'm not aware of any wells in there that have really shown any sustained high producing rates, including ours, I might say, the six that we have drilled on our lease.

Q Let's -- let's talk about the half mile buffer. I think it's acknowledged that that is my client's concern, is how to make the transition.

A Yeah, I certainly --

Q How to make the transition from 40's to 160's and where that transition line affects the owners who are outside of that line.

A Right.

Q All right, let's look at the line. If we look at the actual four-section area, won't you agree with me that in the south half of Section 35, when we look at the No. 8 and 9 Well, you've told us that those wells demonstrate characteristics of wells that are more typical of the Ojito Gallup-Dakota.

A That's correct, and that's, I think, supported by the curves I've shown; even though it's three months production, it doesn't appear to have any sustained high rates that would indicate interval fracturing.

Q If we want to follow your logic of separating out the high IP wells from the lower IP wells in the rest of the pool, wouldn't it be reasonable to include the south half of Section 35 in the old pool and start the one-half mile buffer, then, at that point? That would be consistent with the testimony and the data we have now.

A Well, in a sense it would. I guess my feeling is, and again where fracturing is a controlling matter, that trying to narrow that delineation line so closely, I think, is getting a little beyond our ability. If we -- if we do it here, then we'll certainly have to do it all around the pool and we're going to end up destroying the effort that we're putting forth to try to develop this pool on 160's.

The same thing could be said of, I guess,

Section 25, where we only have one well in that section and I just don't believe it's relevant based on the information we have to start blocking off 40's to delineate a pool.

You made a point. Those two wells are not as indicative of the high potential as are other wells and I think they show certainly a gradation of the loss of fracturing to the southwest, but we chose that because we have developed it; it's our lease, and with the -- with the variation in the boundaries of this fracturing, any time we complete a well for 300 barrels a day, it's going to lead to offset development.

Q All right.

A On 40-acre tracts I think that defeats our whole purpose.

Q Let me ask you some questions. If we don't have the one-half mile buffer, all right, and the transition from 40's to 160's takes place at your Jicarilla lease line, then I believe your concern is that of the four wells along the south tier, particularly, you have the potential of being subject to eight wells on the opposite side of the section line.

A That's a possibility.

Q All right, in the absence of a buffer.

A Uh-huh.

Q All right. I believe you've also told me

that there doesn't appear, or at least the geologist, there doesn't appear to be any distinction geologically that would separate that line into a separate pool. We're going to see some fracture systems developed south of the yellow line.

A There may be.

Q All right.

A Development, I think, will have to prove it, and as I said, I don't know the results of the one well that has been drilled there. Maybe that's the answer.

Q If instead of having the transition and spacing along the Amoco lease line, if we put in place the half mile buffer line, and then we cut a line across Sections 1 and 2, then the transition or the conflict in spacing is going to take place on someone else's property other than the Amoco acreage.

A Let me -- let me make clear where that line is you're drawing there.

Q Yes, sir. I simply drew a line running east and west through Section 2 and then through Section 1, separating the northern half of each side of --

A Just right through the center of the section.

Q Yes, sir, to identify the half mile buffer.

A Okay, yeah, uh-huh.

Q All right, south of that line, then, under current pool rules, those owners have the ability to drill wells on 40 acres.

A That -- that's correct. That's the problem at the extent of any boundary, be it a half mile or a mile, and I can't -- I can't solve that problem; none of us can, but I -- that's why we backed up to a half a mile, because we don't feel confident enough in the limit of this fracture system to force people a mile away into some pattern that shouldn't be, so, no, you're right, along the south end of that half section line is back to 40-acre spacing.

However, the operators in that area have not seen fit to drill on 40's, and as development proceeds out through this buffer area, wells are drilled. Their initial potential is reported and if they are in the pool, zap, the pool boundary jumps out a mile this time, because that's the statewide rule, beyond what we request, I would assume, or at least a half a mile.

So unless people step out a half mile or a mile beyond the proven field and start drilling on 40's, which I don't believe they will, the step out development, I think, protects everyone. If the pool does extend based on high productivity, then the rules will automatically extend it.

If the relatively, and I say relatively, poor well is developed, the pool won't extend and then the parties are free to drill on whatever pattern they wish.

Q Let's look at the progression of how the Ojito Gallup-Dakota was developed. Now that is the well -- the pool since '72 that's had a one-mile buffer around it.

A That's correct.

Q And in --

A Well, no, it hasn't.

Q Well, isn't it the one that has been expanded?

A Well, it's -- maybe it has. I'm not sure that the Ojito Gallup Pool, which doesn't have any specific pool rules.

Q It's statewide spacing.

A It's statewide spacing there and I'm not sure that there's a one mile buffer around it. I know -- I'm not trying to make a point of it; I'm not sure there is.

Q All right.

A But be it so.

Q Is it not correct, based upon your understanding, that the Division, even under statewide spacing, will take the initial wells in a pool and then require subsequent wells within that mile to be subject to the original pool and thereby have a natural progression and development

of the pool?

A That's correct, yes.

Q All right.

A If that one-mile buffer is in effect here. Along that line I think it may be relevant, our -- our four-section lease was -- was not in the Ojito Gallup Pool although it was adjacent to it, and yet we -- we were forced to come to the Commission and request an extension to allow us to commingle the Gallup-Dakota. This was, oh, perhaps two years ago.

So at that time the one-mile extension didn't appear to be in effect or we might have been -- but I don't think that's a major point to make here.

In any event, this pool is on statewide 40's, and whether there's a one-mile boundary or ten-mile boundary, any wells would have to be on 40's. That's whether it be a wildcat or a development well.

So in a 40-acre area it's irrelevant what the boundary is and what the -- what the buffer zone is.

Does that sound reasonable? I don't see what the relevance of a buffer is for the 40-acre development proceeding?

Q The difficulty, obviously, is where the transition takes place in the spacing.

A That's correct, uh-huh.

Q And you'll agree with me, won't you, that the Commission normally determines that in terms of the geology and what they've identified as a common source of supply.

A That's correct.

Q So that when we move out of one source of supply to another common source of supply or reservoir, then the difference in spacing is not a problem because these are isolated reservoirs.

Here we've got a different kind of problem in that we're really dealing with a blanket Dakota -- Gallup.

A Uh-huh.

Q Some wells in which are higher producers because they encounter the natural matrix fracturing that we know exists in the Gallup.

A That's correct.

Q And the difficulty for all of us is deciding how to space the whole area as opposed to simply isolating out Amoco's acreage and figuring out the spacing for that.

Why don't we just do the whole pool, Mr. Boyce?

A Well, basically, I have, and I see your problem but this -- this is the only pool that we can de-

fine.

Two years ago in the Gavilan Mancos area an area was selected as being the pool that they could define at that time and the two are not the same, in my opinion, and I believe our geologic evidence supports it, that there appears to be a different level of fracturing in the two. It's a much smaller nose; there's a lesser degree of dip. I don't believe that everything on this map can be classified as a pool. It's really not that simplistic, but we're, as I said, we'd have recommended including Ojito. We couldn't develop any evidence to support that.

And these things have to be based on evidence and at this time we're presented all the evidence we can in this limited area. I don't have a good answer for what the rest of the pool -- it will have to be developed to show what -- what the productivity is.

Q Do you have sufficient information yet available to you, Mr. Boyce, from which you can do any drainage calculation to see what your wells are doing in terms of drainage?

A We do not at this time. Drainage in a fractured reservoir is -- is a classic problem, and we -- we all hope that the time will help answer it; that after our wells are on production, when we drill the next 160, we may see some variation in bottom hole pressure. We may be able

to run interference tests. That's not even positive because I think based upon the fracturing trend here, and I think from a picture we saw of our particular core, these fractures are of an oriented direction. We don't see multi-directional fractures, at least we haven't seen it in the core. That means we probably have directional trends of drainage.

We could possibly see effects of drainage between two wells in one direction; perpendicular to that we might see none; and that's -- that's one reason we feel that 160 is more proper. We could have drilled this on 320's, but considering the -- not only the visual evidence on the cores, but the analysis which showed us the matrix rock is very, very marginally produtive, we feel it's necessary to drill on a reasonable pattern to effectively drain this rock, and --

Q If the Commission established this as a separate pool, are you asking for temporary rules for a one year period?

A We haven't --

Q Have you discussed or decided that?

A We haven't asked that. We considered the possibility and were we to have either developed it or recommended developing it on 320's, or on 640's, which some people would perhaps prefer, we feel that -- that type of

wide spacing with the obvious potential for infill, if necessary, would be proper to set on a temporary basis.

Q Are you asking that these rules be made permanent, then?

A In this particular area with this particular spacing pattern of 160's we feel it's proper to have they permanent.

Q All right. Do you have any plans -- I take it you haven't conducted any interference test. Do you have plans for any further reservoir studies such as interference testing?

A I would certainly hope so. I can't give you any specific plans now. Our four wells have only been on production three months and we realize that we have a unique reservoir.

Q Thank you. I have nothing further.

MR. CATANACH: Any other questions?

MR. PAULSON: Just a couple, if I might.

REDIRECT EXAMINATION

BY MR. PAULSON:

Q Mr. Boyce, a question was addressed to you concerning Wells 8 and 9 in the subject area, which

would be in the south half of Section 35, and the suggestion was made that those low rates of productivity are indicative, more indicative of the Ojito Gallup Pool. I think you said that certainly the rates of production --

A That's correct.

Q Let me ask you this question: With respect to Well No. 11 in the southwest quarter of Section 36, and I believe that would be the well closest to the Union Texas acreage, is that correct --

A If I understand where Union Texas acreage is, yes, although I don't have a map here that shows their acreage, but I believe it would be, yes.

Q My question is, the production data from Well No. 11, is that more indicative of the Ojito Gallup Pool to the south and west or more indicative of the new pool that's been identified along this fault line?

A No, I think with it's high initial potential and real sustained production for more than 3-1/2 months, that it's indicative of a more highly fractured area and it's supportive of being in the change, in the trend area of going to a new pool.

Q And would, in fact, indicate that the acreage to the south certainly has a potential to be within that same pool.

A I would certainly think so based on the

geology that I see and recognize; again having to be proved by -- by drilling.

That's why we didn't include it in our spaced area.

MR. PAULSON: No further questions. Thank you.

MR. CATANACH: I have no questions of Mr. Boyce.

MR. KENDRICK: I have some questions. May I direct them or should I go through counsel?

MR. CATANACH: Why don't you go through counsel, Mr. Kendrick.

MR. KELLAHIN: Mr. Examiner, that concludes my examination of this witness. I have no more questions for him.

MR. CATANACH: Mr. Boyce may be excused.

MR. PAULSON: That concludes our presentation. I believe we've moved the admission of all of our exhibits.

MR. KELLAHIN: And there was no objection.

MR. CATANACH: All right.

MR. KELLAHIN: Mr. Examiner,

we'll call at this time Mr. Bob Frank.

ROBERT FRANK,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q For the record would you please state your name?

A Robert Frank.

Q Mr. Frank, by whom are you employed?

A Union Texas Petroleum.

Q You're a geologist by education, are you not, sir?

A Yes, I am.

Q Have you previously testified before the Division?

A No, I have not.

Q Would you tell the examiner when and where you obtained your degree?

A I received a degree in geology in 1979 from Miami University, Oxford, Ohio.

After graduation I went to mudlogging and then was hired by Enstar Petroleum as of 11-80.

Enstar was bought by Union Texas Petroleum. My capacity at Enstar was Engineering Coordinator. It was a generic term that included full scale prospect generation, development geology, reservoir work, wellsite supervision, both as a geologist and a foreman.

In 10 of '84 I went to work for Union Texas Petroleum and my present duties are primarily to maintain company compliance with regulatory, environmental, and reporting requirements. I've done some development geology work as well was wellsite supervision as a geologist and a foreman.

Q Have you caused to be prepared under your direction and supervision a cross section of certain wellbores that connect the Ojito Gallup-Dakota wells with one or more wells included in the area Amoco seeks to space on 160 acres?

A Yes, I have.

Q Does your company have an acreage interest in the area?

A Yes, they do.

MR. KELLAHIN: We tender Mr. Frank as an expert geologist.

MR. CATANACH: Any objections, Mr. Paulson?

MR. PAULSON: No objections.

MR. CATANACH: Mr. Frank is so qualified.

Q Mr. Frank, for simplicity, let me have you take Amoco's Exhibit Number One, the structure map, and we'll use it as a point of reference.

If you'll take that exhibit and identify for the examiner within the immediate area included in Sections 1 and 2 to the south of the Amoco lease acreage, can you identify for the examiner what your understanding is of your company's acreage interest in the Gallup?

A Within the Gallup, Union Texas has a controlling interest in the southeast of the northeast, that 40 acres, and the southeast quarter of Section 1, and in Section 2 --

Q Excuse me, I think you misspoke, Mr. Frank. You said the southeast of Section 1. It should be the southwest --

A Excuse me, it should be the southwest.

Q -- quarter, right?

A Right.

Q All right.

A Sorry.

Q All right, and then if we look at Section 2, what's your understanding of --

A The north half of the southwest quarter.

Q All right.

MR. PAULSON: Excuse me, could we have that again, please?

MR. KELLAHIN: Yes, sir.

MR. PAULSON: Thank you. I've got it, thank you.

Q All right. I'd like to direct your attention to your Exhibit Number One on behalf of the your company and have you identify what that is.

A This is a stratigraphic cross section hung on the top of the Dakota, the same top in which Amoco has hung their cross sections.

Q You've put different wells or at least some different wells on your cross section than the Amoco geologist.

A Pardon me?

Q Have you used different wells than the Amoco geologist in his cross section?

A Yes. I'm sorry.

Q All right, use Amoco Exhibit Number One and show us the wells that you've included then on your cross section.

A The cross section runs from south to north and starts with Union Texas' McCrodden No. 7, which is in the northwest quarter of 12.

Q All right, then where do we go?

A Northward to the Union Texas Fred Davis No. 1, which is in the southwest of number one; proceeds to the Minel "NZ" No. 1, which is in the northwest of number one; finally ending up in the Amoco area, Section 36, in the southwest quarter, the 118 No. 11.

Q Have you made a determination or formulated an opinion, Mr. Frank, as to whether or not geologically the wells in the Ojito Gallup-Dakota are separate and distinct from the reservoir that Amoco proposed to space within their four-section lease?

A No, they do not appear to be separate.

Q Can you go through the cross seciton and identify for us the reasons or explanations that allowed you to formulate that opinion?

A Starting in the south, well, in regard to all of them, all the wells represented on this cross section, I have colored those areas within the wellbore that are greater than 30 ohms resistivity, colored green.

Please note on the cross section within the depth column that all the perforation intervals are marked.

As can be seen from the cross section, those areas which are colored green, as well as perforated, are continuous from the south to the north, from Union Texas

through Minel's into Amoco's acreage.

Q Have you had an opportunity to look at and review the Amoco structure map that was introduced today?

A Yes. It is very similar to the one that was -- I've used. I drew a structure map; it is very similar to ours with the exception that we did not show the -- the map that we have did not show the fault.

Q Are you aware of any geologic data, information, conclusions, from which you as an expert could conclude that the Amoco four lease -- four-section lease constitutes a separate Gallup reservoir from the Ojito Gallup Pool?

A Through my research I can find no reason that they should be separate in a geologic sense.

Q On behalf of your company, Mr. Frank, what is your specific concern or objection with regards to Amoco's request before the Division today?

A As stated earlier, we see no difference between the two areas in question. We see the same two areas as a common source of supply. We don't feel there is any geologic justification for Amoco's wells being treated differently. We believe that the pool should be developed such that it is consistent with geology.

The pool has been developed for approximately thirteen years under the statewide rules requiring

40-acre spacing.

We also do not like the idea that Amoco has moved a problem that they have perceived out of their acreage into the acreage of those of offset operators.

Q With regards to that buffer zone, Mr. Frank, in what specific way will that buffer zone affect Union of Texas' acreage?

A Essentially it would prohibit us from drilling 100 percent well in our 40-acre tract in the northeast of Section 1.

Q And you have the southwest quarter of Section 1 also? You have that 160-acre tract?

A Yes, we do.

Q And the buffer zone, or transition line, then, would separate out that 160 from the 40 acres to the north of the line.

A True.

Q Are you aware of any geologic justification for making that transition line between 40 and 160-acre spacing cut through those sections at that point?

A No, I can see no justification.

Q Was Exhibit Number One of Union Texas Petroleum Corporation an exhibit that was prepared or compiled under your direction and supervision?

A Yes, it was.

Q And did you specifically color in those areas of porosity that you've indicated on the log of greater than 30 ohms?

A That's not porosity, it's resistivity.

Q I'm sorry, resistivity.

A Yes.

Q In looking at that cross section, Mr. Frank, what do you conclude with regards to the continuity of the Gallup reservoir as identified in those four logs?

A It's laterally continuous.

MR. KELLAHIN: That concludes my examination of Mr. Frank, Mr. Catanach.

We'd move the introduction of Exhibit One.

MR. CATANACH: Any objections?

MR. PAULSON: No objection to the exhibit called No. 1.

MR. KELLAHIN: We called it UTP No. 1.

MR. PAULSON: Union Texas No. 1. No objection.

MR. CATANACH: Exhibit Number One will be admitted into evidence.

Mr. Paulson?

MR. PAULSON: Thank you.

CROSS EXAMINATION

BY MR. PAULSON:

Q If I understand, Mr. Frank, your company wants to drill a 100 percent 40-acre location, is that correct?

A It is in the AFE planning stage. Nothing has progressed past that.

Q What brought about your interest in drilling that well?

A I would just -- to produce -- produce oil. It's an offset well.

Q To what? What well, what data brought about the desire to drill that well?

A The same apparent -- our structure map is identical to yours within this area. We have an economic well as we've decided here, and we feel that we would have one more.

Q Did the drilling of Jicarilla "B" 118-11 to the north in the area of interest have an impact on your decision to drill that well?

A No.

Q Now you've indicated that you see nothing geologically significant or different between the wells along your cross section?

A No.

Q What about the initial production data? Do you see something different on your exhibit there?

A Yes. You range from a -- in the south we have an IP in the neighborhood of 52 barrels a day. The next well is 80 barrels a day. We're waiting on the test information from the Minel well, and the Amoco well has IP'ed at 233.

Q Considerably higher on the "B" 118-11?

A Yes.

Q And that indicates nothing to you with respect to -- to what might be present in the subsurface?

A It would indicate to me that you could have fractured production.

Q So I take it you would agree with Mr. Bottjer that there is a geological difference identifiable in some portion of the -- of the rock in this area.

A Yes. I see that there appears to be some fracturing and production.

May, I also state that your No. 9 was shown to have fractures. No, there's significant production.

Q You were present when Mr. Bottjer testified that in his opinion the production data and other information including cores taken from wells within the sub-

ject area, lead him to believe that there is in fact an identifiably different geological area in the approximate area of the area that's been identified on Exhibit Number One?

A I would not call them different. I would call one possibly fractured and --

Q My question was whether you were present when that testimony was --

A Yes, sir.

Q And I take it you disagree with that testimony?

A In the form that you stated the question, yes. I do not see any geological difference; fracture, yes, possibly.

Q Well, Mr. Bottjer testified that he saw no difference in the log signature of the Gallup in the area of interest.

A Right.

Q And you've said the same thing with your exhibit, have you not?

A Yes, sir.

Q And yet one area has significantly higher production.

A Right.

Q And something accounts for that and it's

a geological explanation, is it not?

A It would have to be, yes.

Q And my question to you is, wouldn't you agree that there is an area within the Gallup in the approximte area indicated by the yellow lines on Amoco's Exhibit No. 1 that is geologically distinct from --

A Within that area there are portions that appear to be geologically distinct.

Q And do you have an opinion as to whether areas immediately to the south of that four-section area might be similar or dissimilar to the geologic conditions existing within that four-section area?

A I haven't formulated an opinion for the entire area. I would like to see what comes of the Minel well. I haven't formulated an opinion. I don't know.

Q But it's certainly possible, is it not, that areas to the south might exhibit the same sort of characteristics in terms of fracturing?

A It is possible.

Q And you would agree with me that drainage will occur through fractures over the extent of the fractures that are open to the wellbore, is that correct?

A Yes, it should.

Q And I assume you would also agree that those fractures, as exhibited by the production data and

other data from the area of interest may well extend over an area larger than four acres, isn't that correct?

A It is possible, as Mr. Boyce indicated.

Q Your request is to -- to obtain relief that would allow you to drill a 100 percent 40-acre well. Is there any reason why you couldn't await the results of the Minel well and if appropriate come before this Commission with a request for an exception from that buffer requirement?

A We could possibly wait. I would like to state that in -- in opposition to the application here, that maybe we should draw the line here and you should wait to include your buffer zone until we see what the Minel well covers.

Q Well --

MR. TAYLOR: Excuse me, could you for the record indicate where you're pointing at there? "Here" doesn't show up too well.

A Okay. The buffer zone would -- that Union Texas is protesting, it would be the north half of Sections 1 and 2.

Q Would you agree that just across the section line of Exhibit Number One in the area of interest that, as exhibited by Amoco's 118-11 Well, something significantly different geologically takes place from wells to

the south, and you've also testified that that may be present under some portion of Section 1?

A The answer is yes.

Q And I would submit that that's a reason, Mr. Frank, wouldn't you agree, for including that area within the buffer until such time as wells are drilled to determine whether the rock under that section is similar or dissimilar with the -- with the conditions existing under the area?

A Yes.

MR. PAULSON: Nothing further, thank you very much.

MR. CATANACH: Mr. Kellahin?

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q Mr. Frank, Mr. Paulson asked you about the No. 11 Amoco well, the high IP being attributable to encountering fractured matrix porosity.

Is there information available from which you can geologically determine the orientation, the extent, and the effect of that fracture system on that well?

A Not at this point, no.

Q Can you explain the absence of high producing rates in either the No. 8 or No. 9 Amoco well?

A No, other than they may not be fractured.

Q Have you determined whether or not there are other wells in the four-section area, of the Amoco application that may or may not have encountered the fractured matrix porosity?

A It is possible that some of those have not.

Q Do you see any significant pattern between the Amoco lease acreage in terms of the fracture system and the geologic characteristics of the wells that you've examined in the Ojito Gallup Pool?

A I see a similarity.

Q Can you reach the conclusion geologically that the fractured matrix system that may be present under some of the Amoco wells is confined only to those Amoco sections and the buffer area that they propose?

A We cannot determine that at this point.

MR. KELLAHIN: Nothing further.

MR. CATANACH: I have nothing further of Mr. Frank at this time.

MR. KELLAHIN: I have one more witness to call, if that's all right.

(Witness sworn.)

A. R. KENDRICK,

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

DIRECT EXAMINATION

BY MR. KELLAHIN:

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

A A. R. Kendrick, petroleum consultant.

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

A Yes, sir.

Q And have you been employed by Minel, Inc., as an expert petroleum engineer?

A Yes.

Q Pursuant to your employment, Mr. Kendrick, have you made a study of certain wellbore information and producing information in the Ojito Gallup-Dakota Oil Pool?

A I have not studied particular wellbores. I have amassed some information from the official records in Aztec.

Q Are you familiar with the Oil Conservation Division records in Aztec?

A Yes.

Q And are you generally familiar with the Ojito Gallup-Dakota and the rules and regulations of the Commission that apply to that pool?

A Yes.

MR. KELLAHIN: We tender Mr. Kendrick as an expert geologist -- as an expert petroleum engineer.

MR. CATANACH: Mr. Kendrick is considered qualified.

Q Mr. Kendrick, I'd like to refer you to a package of exhibits that I've simply marked as Minel Exhibit One. That package, however, contains four pages.

Is this work that you have generated or compiled yourself?

A Yes.

Q I'd like you, first of all, to identify the cover page of the exhibit so that the examiner has an understanding of what it is that you're about to show.

A The cover page shows the Township 25 North, Range 3 West, and the southern third of Township 26 North, Range 3 West, as a general square-type township, which is really not the case, there are some minor variations to the legal survey, but this represents the township and the part of the township. This would also in-

clude the four sections which Amoco proposes to space in the proposed new pool.

It shows the, by cross hatching, the entire Ojito Gallup-Dakota Oil Pool. It shows a portion of the West Lindrith Gallup-Dakota Oil Pool, which is in the south part of Township 25 North, Range 3 West.

Q When we're looking for the West Lindrith Pool, is that identified on your exhibit by the cross hatched lines running from northwest to southeast?

A Yes.

Q And then when the lines go the other direction on the diagonal, that shows the transition into the Ojito Gallup-Dakota Oil Pool?

A Yes. Yes, sir.

Q And then up in the upper right margin of the exhibit, those include the four sections that are in Amoco's application today.

A That's correct.

Q All right. What is the current spacing in the Ojito Gallup-Dakota Oil Pool, Mr. Kendrick?

A Statewide spacing of 40 acres.

Q Can you identify for us or draw any similarities that you may be aware of in your long experience as a consultant and as an employee of the Division, to see if the Commission has ever overlapped pool rules as Amoco has

proposed in this specific case to accomplish?

A There was one attempt to overlap pool rules in the Gavilan Pool but the pool rules were only in effect for about thirty days or sixty days and they respaced the pool and this is the only attempt that I know of ever occurring in the State of New Mexico.

Q What is your opinion and understanding of the difficulties with separating out a portion of this pool and spacing it on different spacing rules than the balance of the pool?

A First, according to the Division's definition of a pool, which I would like to read into the record here, in the definitions part of the book of rules and regulations, it defines, and says: "Pool means any underground reservoir containing a common accumulation of crude petroleum oil or natural gas or both. Each zone of a general structure, which zone is completely separated from any other zone in the structure, is covered by the word 'pool' as used herein. 'Pool' is synonymous with 'common source of supply' and with 'common reservoir.'"

I find no separation to cause this to be a separate pool. The testimony of the preceding witness, and I think of the Amoco witness was that these are wells all completed in the same reservoir.

Q Do you see any reasonable engineering

basis to separate out from the common pool an area that contains certain wells that have initial higher potentials than other wells in that same pool?

A No. I find that in all pools to which I have ever made any study, that the potentials of the wells always varied and there are some good wells and some bad wells in most pools.

Q Would you recommend to the examiner that this particular pool be segregated out whereby the four sections under the Amoco Jicarilla Lease are operated under a different spacing pattern than the balance of the pool?

A No. I can see no reason to isolate four sections and take them out and treat them separately from the remaining wells within the pool.

Q Would the fact that certain of those wells in the Amoco acreage may have encountered fractured matrix porosity and thereby have greater producing capacities cause you to believe that they ought to be segregated into a separate pool?

A No, because the studies that I've made in this similar area and other areas was that when fracturing occurs it usually occurs when complex bending takes place. That's where a general folding of the reservoir has occurred and then when it's attempted to bend it in a separate direction the formations are pulled apart.

In Amoco's area they are speaking of high potential wells in Township 26 North, Range 3 West, to the four sections in the southeast corner; however, to the south and west from there, down in Sections 22 and 27, I think, if you'd refer to about the last page of the packet, you'll find in the West Lindrith Gallup-Dakota Pool in Section 27, Unit letter K, ARCO Oil and Gas Company recently the ARCO Leeson and reported an initial potential of 420 barrels, and this is right in the middle area of the flattest part of the reservoir, so the complex bending apparently is not the reason for that well having a high potential rate.

Q Are there other examples on your tabulation of initial potential data from wells in the Ojito Gallup that would show wells consistent with the type of initial potentials that Amoco's experiencing in their wells?

A Yes. The Joseph B. Gould wells in Section 32 of Township 25, 3, show several wells with high potentials and interspersed within those are wells with much less potential all within the same section, all within very similar characteristics based on the structure map presented as Exhibit One by Amoco.

Q If we look on page two, which I think it's stapled together would be page three of the package of your exhibit, page two of the tabulation, directing your attention to the Amoco wells that would have been included in

the four-section area, can you comment or draw any conclusions about the ranges of initial potentials that are recorded for those wells?

A As I read the reports, the well in Unit letter F of Section 35, being the Jicarilla Apache "A" 118 No. 13, had an IP of 36 barrels. That's much lower than some of the other wells within that area, but I don't find that extremely uncommon within the San Juan Basin. The permeabilitues vary widely among the wells within each pool up there.

Q How about the No. 8 Well?

A The No. 8 Well, located in the southwest quarter of Section 32 -- oh, excuse me, I'm looking at the wrong --

Q No, sir, it would be Section 35.

A I'm in the wrong group. In the southeast of Section 35 with an initial potential of 63 barrels, it's not a high volume well, either.

Q I note in reference to the Amoco Jicarilla Apache No. 13 Well that there is a difference between Mr. Boyce's report of the initial potential on that well and what you've tabulated. His Exhibit Number Five shows 223 barrels and you've shown 36. From where did you get your information, Mr. Kendrick?

A I took my information from the card file

in the Aztec Office, Oil Conservation Division.

Q All right. What is the specific concerns as you understand them on behalf of your client, Minel, Inc., Mr. Kendrick, with regards to Amoco's application before the examiner today?

A Minel, Incorporated, owns some acreage in the north half of Sections 1 and Section 2 of Township 25 North, Range 3 West, and believe that this acreage being included within a buffer zone restricted production -- or restricted only one well per quarter section is an imposition on their rights to drill and develop their acreage.

Q Do you have an objection to -- let me rephrase that. How would you propose, if the examiner decided to create a separate pool of the four sections, do you have a recommendation to the examiner what he should do about the proposed buffer zone?

A I think if the applicant needs a buffer zone in their pool that they can supply the buffer zone around the edge of their tract instead of imposing it on their neighbors.

The pool rules which Mr. Boyce has referred to as Rule 104, Section A, provides that any well drilled outside of a pool which is not classed as a wildcat well, shall be classed as a development for the nearest pool which has produced oil or gas from the formation to which the well

is projected.

Any such development well shall be spaced, drilled, operated, and produced in accordance with the rules and regulations in effect in such nearest pool provided the well is completed in the formation to which it was projected.

Now this says wells outside of a pool. These wells are inside of a pool and we'd like to operate under our pool rules.

Q Is there anything else you'd like ot add to your testimony at this point, Mr. Kendrick?

A Well, I think I would like for the examiner to understand that one the root problems to this whole case is probably the fact that the Jicarilla Apache Reservation line separates Township 25 North, Range 3 West, from Township 26 North, Range 3 West.

Q Why does that have an effect as far as you're concerned on the proposal to change the spacing in this area?

A I haven't experienced it myself, but a few coffeeshop rumors advise me that the Apaches are very adamant that their acreage be drilled to the density as the offset acreage, and I think this may be one of the bases for this case being called today.

That reservation line also turns north at

the southeast corner of Township 26 North, Range 3 West, and runs along the east side of the four-section tract.

The dashed line does appear on Amoco's Exhibit One, but it is not identified within the area of this plat.

Q Are you aware of the Commission in your experience before the Division, Mr. Kendrick, determining spacing patterns in a common reservoir based upon various individual ownership problems or drilling commitments for certain operators in that common reservoir?

A No, sir.

Q What is the basic principles upon which you understand the Commission to operate and space wells in the San Juan Basin?

A The policy that was followed when I worked for the Division was that the spacing would be set to represent the drill tract which would be economically and efficiently drained by one well.

Q Would it be consistent with the policies that you understood if instead of isolating out a portion of the pool and determining spacing for that section, that the entire pool or reservoir would be the subject of a hearing to determine what that spacing should be for everyone involved in the same common source of supply?

A I think that one set of rules should fit

everybody in the same pool.

Q Was Exhibit, Minel Exhibit Number One, Mr. Kendrick, prepared by you?

A Yes.

Q Based upon information that you have examined and obtained from the District Office of the Oil Conservation Division?

A Yes.

MR. KELLAHIN: We move the introduction of Minel Exhibit Number One.

MR. CATANACH: Minel Exhibit Number One will be admitted as evidence.

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

MR. CATANACH: Mr. Paulson, your witness.

MR. PAULSON: Thank you, Mr. Examiner.

CROSS EXAMINATION

BY MR. PAULSON:

Q Mr. Kendrick, you said your understanding was that the size of the unit should be based on what the well will economically and efficiently drain, is that correct?

A Yes.

Q Do you have any problem with spacing in Gavilan Mancos of 320 acres, based upon a fracture system?

A Yes.

Q Do you think it should be spaced on 40's?

A No. I recommended that the pool be spaced on 160 acres.

Q Based upon the fracturing present.

A Based upon the reservoir characteristics that were available at the time the first case was heard.

Q Wasn't it indicated that there was fracturing present --

A Yes.

Q -- in the Gallup and that that was a substantial basis for the larger spacing?

A Yes.

Q You don't purport to be a geologist, I assume?

A No, I didn't qualify as a geologist.

Q And you -- but you heard the testimony concerning the existance or the interpretation of the structural nose lying just to the east of the area identified. You wouldn't quarrel with that based upon your understanding.

A I have no knowledge of that so I cannot

contest the structure map that you have.

Q And I assume you also wouldn't contest the balance of the geologic testimony, then, that indicated that the interpretation was that that -- that the presence of a structural nose indicated an area of fracturing, perhaps along the fault, and that that was responsible for the higher production from the area?

A I've testified that the complex bending would be indicative of the character that creates fracturing.

Q But you haven't done a geologic study of this area.

A No.

Q And you don't purport to tell us what the geology is under the area.

A No, I don't purport to tell you.

Q I understood you to say that the important thing here was that you be permitted to drill your well and that you really didn't think, and please correct me if I'm wrong, but it sounded like you were saying that the area that would be drained by a well should be disregarded in terms of whether you should be permitted a drill a well in your acreage, is that what you said?

A No, what I said was that I thought everybody who had a well in the pool should have the same set of

pool rules, whether it be 40 acres or 160 acres --

Q Well --

A -- but that -- excuse me, go ahead.

Q No, I'm sorry, I wanted you to continue.

A I'm sorry, I'm going to quit.

Q Okay. Well, it's a fact, isn't it, Mr. Kendrick, that in the West Lindrith Field, spaced on 160, and I assume you think that was the same pool. It's all Gallup and it all looks the same on the logs, doesn't it?

A From the logs that you presented today it is indicative to be very similar, yes.

Q Matter of fact, the wells that you cite on your exhibits in Section 27 and 32 to the south, what is the spacing for those -- those wells?

A 160 acres.

Q 160 acres.

A Yes.

Q Not 40 acres.

A That's true.

Q And you wouldn't disagree with that, I assume.

A I do not disagree that West Lindrith Gallup-Dakota Pool is spaced on 160 acres.

I also presented in this exhibit a tabulation on the last page of the wells in the Township 25, 3,

in the West Lindrith Gallup-Dakota Pool wherein seven completed -- excuse me, three, six, yeah, seven completed wells in Section 32, which means that they're drilled a density greater than 160 acres.

Q And presumably that was based upon evidence presented at a hearing to get an exception, wasn't it?

A No, sir.

Q Upon what basis was it drilled, if you know?

A The latest information I have from the District Office In Aztec was that up to four wells may be drilled in the West Lindrith Gallup-Dakota Pool on each 160-acre drill tract without special exception.

Q Well, Mr. Kendrick, you, I assume, would suggest to this Commission that the spacing units that are effective should be of a size to protect correlative rights and prevent the drilling of unnecessary wells and the waste that would ensue, wouldn't you?

A Provided they would efficiently and effectively drain the drill tract.

Q And you wouldn't disagree that the rates of production from the area of interest are significantly higher than rates of production to wells to the south in the Ojito Gallup Pool, would you?

A You mean the production rates in your

proposed pool, is that the question?

Q Correct.

A No, I don't disagree with your values of producing rates in this area as relative to the -- to the Ojito Gallup-Dakota Pool, the main part of the Ojito Gallup-Dakota Pool.

Q And you have no basis to dispute the geologic explanation for that greater productivity, higher rates of production, isn't that correct?

A That's right, I have no geologic information to tell me that all the wells should have the same potential.

Q If in fact the geology is different under a section of the Ojito Gallup-Dakota Pool, if it's different such that it's going to drain more than 40 acres, you wouldn't encourage the Commission to ignore that evidence and refuse to create larger drilling units, would you?

A I would not encourage them to refuse to grant larger units; however, each drill tract is going to have a different type of geology. We have no reservoirs that have identical geology from drill tract to drill tract so we have variations in the amount of reserves under each drill tract. We have variations in the producing abilities of the wells on a well tract, so we don't have any place yet to show that we have reservoirs such that each drill tract

is geologically identical with each other. They all have to be different.

Q Nevertheless, in Gavilan Mancos evidence was presented that one area was geologically distinct and on that basis 320-acre units were created. You didn't disagree with the calling of that hearing and the consideration of that evidence, did you?

A Yes.

Q You thought it should have been left on statewide 40's?

A No, I suggested it be put on 160-acre spacing.

Q Well, then, my question was whether you disagreed with the calling of the hearing to consider evidence that certain Gallup rock under the area is different than other rock in terms of what it will drain, and I take it the answer is you thought that was a good idea to have the hearing and consider the evidence.

A The call of the hearing for the Gallup -- excuse me, for the Gavilan Pool was for the whole pool, not for a part of the pool but for the whole pool, and as I understand it, the rules that were written were for the whole pool, not, you know, not treat part of the pool one way and part of the pool another way.

It is adjacent to what had been set out

as the Puerto Chiquito Pool but within the Puerto Chiquito Pool there were no wells drilled within two miles of that boundary at the time that case was heard, so there was no infringement upon another well in the pool.

Q Mr. Kendrick, you've reviewed Exhibit Number Two, Amoco's Exhibit Number Two, have you not, the cross section?

A No.

Q Well, referring to Exhibit Number One, which is before you, you see the cross section line running from the West Lindrith up through the Ojito Gallup, into the area of interest, and then down into the Gavilan Mancos.

Did you review that cross section?

A I see that there's a trace of a cross section here. I did not see --

Q Let me provide that to you. The well on the far right is in the Gavilan Mancos Field, isn't it?

A Yes.

Q And would you disagree with the testimony that was presented this morning that the log signature of the Gallup across that entire interval is very similar and, in fact, one is unable to determine why one is more productive than the other, based on the log signature.

A Based on log signature, that's correct.

Q So again my question is, the Gavilan Man-

cos, with similar log signature to the Ojito Gallup, a hearing was called to present evidence that the spacing for that portion of the Gallup should be larger, and my question for you is why shouldn't the same thing be done here, where there's evidence to that effect?

A We have no evidence here that the Gavilan Pool is connected to these other pools. The logs you referred to here are spaced some seven miles apart between the one in your zone of interest and the one in the Gavilan Pool, and there is an area of about three miles in there in which no well has been drilled.

There's no evidence to indicate that the pools are connected.

Q They're correlatable across that interval, isn't that correct?

A No, they're in comparable depth positions but that has nothing to do with what's in between those two wells even though they're logged at similar depths seven or eight miles apart does not mean that they're -- the geology is the same for seven or eight miles.

Q What about going the other direction, down to West Lindrith? That's a further distance, isn't it? Would you agree they're correlatable from the area of interest down to West Lindrith?

A Yes, and there are wells within each sec-

tion along your trace of your cross section.

Q Do you have any evidence to present to the Commission that Gavilan Mancos is a separate and distinct pool from this area of interest?

A No, sir.

Q What's the purpose of a buffer, Mr. Kendrick, based upon your experience with the Commission?

A I'm not sure I understand it till yet. The offer of Mr. Greer to buffer his producing area in the Puerto Chiquito area didn't make sense to me and the only sense that I can make out of this is that the buffer would be off the Apache Reservation and Amoco would not be faced with drilling offsets to match the density of wells off the reservation.

Q Would you disagree with me that the purpose of a buffer is to permit the potential drilling of unnecessary wells pending further development?

A Not when the call to hearing is asking for permanent pool rules, no, sir.

Q You don't think that's the purpose of a buffer?

A No, sir.

Q How many wells would you like to see drilled on the north half of Section 1?

A We're not sure yet. We don't have the

"NZ" No. 1 Well potentialed yet. We don't have a well drilled in the northeast quarter of Section 1. So we don't know how many wells would effectively and efficiently be needed to drain the drill tract or how many would be economically feasible in that area.

Q In the absence of that evidence do you agree that drilling should be controlled?

A Not controlled, but -- or not restricted but controlled.

We have a 40-acre spacing pattern for that pool.

Q And yet there's evidence presented here today that 40 acres is inappropriate given what we know about the geology in the area of interest.

A But that does not isolate any one part of a pool as being in a separate source of supply. Sure, you have a fracture system that is better developed in that area and you have greater producing capacity of the individual wells, but it does relate to the reserves under the tract and it does not in any way show, in fact, as I understood the geologic witnesses, they testified that these are all in the same pool.

Q Is it your understanding that Minel and Union of Texas would propose to drill 40-acre offsets to each other just south of this area? That's what they'd like

to do?

A That's entirely possible.

Q And you think that's appropriate?

A We'll know when --

Q Without -- without well information being present to indicate what drainage actually might be.

A In drilling oil wells there's always an element of risk and drilling an additional well is sometimes necessary.

MR. PAULSON: No further questions, thank you.

MR. CATANACH: Mr. Kellahin, do you have anything further?

MR. KELLAHIN: Nothing further, thank you.

MR. CATANACH: I don't have any questions of the witness.

He may be excused.

Mr. Paulson and Mr. Kellahin, would you like to make closing statements?

MR. PAULSON: I would like to give a brief one, if I might.

MR. KELLAHIN: Since Mr. Paulson was the applicant, I think normally he has the right to go last if that's your desire.

I'll be happy to be brief and concise if --

MR. PAULSON: Sure.

MR. KELLAHIN: -- you'll permit me.

Mr. Catanach, you don't have any choice but to deny the application. I think it has been framed for you in terms of this application in a way that leads you to no other conclusion.

There are ways that were suggested today or inferred in today's testimony, by which we can determine the appropriate spacing in the pool.

It violates every principal I'm aware of in your rules and regulations to isolate out from what everyone acknowledges is the same common reservoir that portion of the reservoir that has the potential among certain of its wells to have higher producing rates.

That's not how we do things around here and there's a very specific reason that you've not done it for anyone else and should not do it for Amoco.

Their wells are very new. There is not significant production from which Mr. Boyce can do any of the typical engineering calculations. He can't (not clearly understood) permanent rules out of acreage in an existing pool without more substantial evidence.

What they have sought is to avoid encroachment upon their acreage and to avoid drilling of additional wells by suggesting a buffer zone of a half mile be carved out of a well -- out of a pool that's been developing for some thirteen years.

We suggest there is several choices, the first of which is to forget about the buffer entirely. One of the reasons that works is that there is a depth bracket oil allowable based upon acreage. The Amoco wells will have a significant depth bracket allowable on 160 acres versus an offsetting well that would have 145 barrels versus 382 on 160.

So there's a natural disparity in the allowables that would allow these high producing rate wells that Amoco has to compete even against multiple wells on their south boundary. There may be more of them but the allowable is naturally restricted.

If that in and of itself is not adequate, when the Minel well is completed and producing and when Amoco develops further production information, the Commission on its own initiative or by any party, can come in here and set specific allowables for these wells that are in direct alignment with Amoco's acreage, and you wouldn't have to determine spacing. The natural transition from one acreage ownership to another can be handled in terms of the

allowable each well is entitled to produce.

The case before you today cannot be granted because it violates your principal rule, the definition of a pool. Everyone agrees this is the same reservoir. The fact that Mr. Paulson urges you to believe that this area because of the flex in the structure is more likely to be fractured and that certain of these wellbores have communicated that fracture, doesn't solve the problem.

You have to take into account that within the proposed pool area the No. 8 and the No. 9 Well haven't encountered apparently the high producing rates. They very much operate and act like the wells in the heart of the Ojito Gallup Pool. There's no basis, no consistent basis for treating them differently.

I think the way Amoco has presented the case, they've given you no other choice, Mr. Catanach, but to deny it. We would suggest that the appropriate way you do this is like we always do it, let's notice up a hearing and space the whole pool. If there is an argument that de facto 160-acre spacing is taking place, that this is simply a natural extension of the rest of these Gallup pools, then let's do that for everybody.

But the burden of proof is not on us. We came here to see what they're doing. It's Amoco's case. It's their burden to show and demonstrate to you

that they have a distinctive, separate source of supply. That's fundamental principal and they can't do it. They ask you, well, give us a break and fix it with a buffer and do all these little things, it doesn't work that way and ought not to work in this case.

We suggest to you that we start this all over again, get the right kind of application before you, and let's talk about spacing for all these wells. Let's get some more operators in here. Let's talk about what we ought to do with the whole area and maybe we can resolve the entire problem, but let's don't six Amoco's concern about their acreage and simply move that buffer and affect Minel and UTP and other owners and make them face the 40/160 acre problem if it occurs. This is Amoco's case. Let them meet that burden, not us.

Thank you.

MR. CATANACH: Thank you. Mr. Paulson.

MR. PAULSON: After that I'm not going to say I'm going to be brief. I'll be as brief as I can.

If the Examiner please, Mr. Kellahin suggests that -- that this is without precedent and violative of the rules, and I would suggest to him and to you that a simple review of the areas shown on these exhi-

bits will indicate that's incorrect, absolutely incorrect.

The Gavilan Mancos, West Lindrith are both Gallup pools. They -- this Commission has recognized that they drain different areas within the Gallup. What we are requesting is really not the creation of a new pool as he keeps indicating. We're requesting that this Commission acknowledge that the Gallup will drain certain areas, different drainage areas. There will be different portions of the rock that because of fracturing or because of other characteristics will drain more than 40 acres.

He's suggested that -- that he wants to call up the entire Ojito Gallup Pool for hearing. The evidence in that case would be similar, or identical to this case, namely, that there's a distinct area to the north, which is bounded roughly by the four sections we've identified. The evidence wouldn't change because he got to delay the proceeding.

Let's don't mistake what the intent of the protest is. These two companies want to drill 40-acre offsets to the south of some good wells; that's what they're after. They want to forget about correlative rights; they want to forget about the prevention of waste.

Now, as was pointed out by our witnesses, Amoco has a 40-acre tract and you can see it on our Exhibit Number One, just to the south and east. We can

drill a 40-acre well down there. We anticipate that that may well be within this geologically distinct area.

In the interest of conservation, prevention of waste, we've come before you suggesting in good faith the establishment of this area as a geologically distinct, separate area of the Gallup, with an appropriate buffer. Statewide rule is a mile. I would suggest that's for a very good reason; the idea is to go wide and see what happens; see how development goes, and not permit operators like these guys to come in here and take advantage of a new play and drill 40-acre offsets while you're gearing up for this hearing he wants you to go to, and that's what they'll be doing is drilling two 40-acre wells or more while you're preparing for a hearing.

Mr. Kellahin said it's our burden to show that there's a difference. I agree with him. I would submit the evidence is -- in uncontradicted, that there is a distinct geologic area as indicated by the interpretation that shows a structural nose similar to Gavilan Mancos, and this Commission under similar evidence established different spacing for the Gallup down there.

There is evidence of faulting and fracturing. We have core photographs that indicate that there are natural fractures present. The photographs show calcite fill indicating the fractures were present in the

wellbore and not created by the coring process, and the evidence, again, I would submit, is overwhelming that there is a distinct geologic difference in and around this area and that does carry the burden and does justify this Commission in granting the application.

I think that the question is how can this Commission best fulfill its statutory obligation to prevent waste and protect correlative rights.

And that's the question you should ask yourself.

The opponents in this application are basically indicating that until everything is pinned down tight they ought to be permitted to take advantage of the situation. We are attempting to suggest to this Commission that the appropriate thing, given the data that we have and the facts that we have, is to create 160-acre spacing with a buffer and see what happens.

Clearly the evidence shows that there are rapid changes that occur; the two wells that he mentions, I think it's 8 and 9, as indicated on Exhibit Number One, do have lower IP's and yet less than half a mile away the No. 11, I believe it is, in the south half of that section, has a very high IP. No. 11 is closer, according to Mr. Bottjer's interpretation, to the fault, so that it does occur over short distances.

If it turns out that that buffer is inappropriate, they can come in here and request an exception. There's a well drilling, as indicated on one of the exhibits, data will be forthcoming shortly that will shed light on that answer. In the interim, it seems appropriate for the Commission to fulfill its statutory mandate and to grant the application with the buffer.

Perhaps -- perhaps you feel that one-half mile is inappropriate; maybe it should be a mile. Mr. Kellahin was, and his client, was moaning about the effect of the buffer, moving the buffer a half mile away and letting the people in the south half take an advantage. Perhaps he's right. Maybe you ought to make it a mile; just leave it under statewide rules, but you ought to protect against the drilling of unnecessary wells and protect against people being allowed to take advantage and drill unnecessary wells in an effort to play closeology and get close to a good well.

Thank you very much.

MR. CATANACH: Thank you, Mr Paulson.

Mr. Paulson and Mr. Kellahin, will you submit rough orders for us?

MR. KELLAHIN: Be happy to, Mr. Examiner.

MR. CATANACH: Is there anything further in Case 8822?

If not, it 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