NEW MEXICO OIL CONSERVATION DIVISION

STATE LAND OFFICE BUILDING

STATE OF NEW MEXICO

CASE NO. 10489

IN THE MATTER OF:

The Application of Yates Petroleum Corporation for an unorthodox gas well location, Chaves County, New Mexico.

BEFORE:

MICHAEL E. STOGNER

Hearing Examiner

State Land Office Building

June 11, 1992

REPORTED BY:

DEBBIE VESTAL
Certified Shorthand Reporter
for the State of New Mexico

ORIGINAL

A P P E A R A N C E S

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BY: **JAMES BRUCE, ESQ.**

I N D E X

E X H I B I T S

EXAMINER STOGNER: Hearing will come to order. Call the next case, No. 10489.

MR. STOVALL: Application of Yates Petroleum Corporation for an unorthodox gas well location, Chaves County, New Mexico.

EXAMINER STOGNER: Call for appearances.

MR. CARROLL: Mr. Examiner, I'm Ernest Carroll with the Artesia law firm of Losee, Carson, Haas & Carroll. I will be representing Yates Petroleum in today's hearing, and I have three witnesses.

MR. BRUCE: Mr. Examiner, Jim Bruce from the Hinkle law firm in Santa Fe representing BHP Petroleum Americas, Inc. I have two witnesses to be sworn.

EXAMINER STOGNER: Any other appearances?

Will all the witnesses, please, stand at this time to be sworn.

[The witnesses were duly sworn.]

EXAMINER STOGNER: You may be seated.

Before we get started, is there any need for opening remarks at this point?

MR. CARROLL: I don't think so.

EXAMINER STOGNER: In that case, Mr. Carroll, I'll turn it over to you.

MR. CARROLL: We would call as our first witness, Rob Bullock.

ROBERT H. BULLOCK

Having been duly sworn upon his oath, was examined and testified as follows:

EXAMINATION

BY MR. CARROLL:

Q. Would you please state your name and by whom you're employed?

A. My name is Robert Bullock. I'm employed by Yates Petroleum Corporation.

Q. And in what capacity, Mr. Bullock?

A. As a landman.

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

A. Yes.

Q. And have you had your credentials accepted as an expert in the field of petroleum land management?

A. Yes.

MR. CARROLL: Mr. Examiner, I would tender Mr. Bullock as an expert in the area or

field of petroleum land management.

EXAMINER STOGNER: Are there any objections?

Mr. Bullock is so qualified.

Q. (BY MR. CARROLL) Mr. Bullock, are you familiar with the pending application that Yates Petroleum has filed in this particular case?

A. Yes, I am.

Q. Could you briefly state for the Examiner what that application consists of?

A. This is an application by Yates Petroleum Corporation for an unorthodox gas well, a well to be located in Township 8 South, Range 27 East, Section 13, 330 from the south line, 1225 feet from the west line, and the acreage dedicated to the drilling of the well is the south half of Section 13.

Q. Mr. Bullock, you have prepared some exhibits for use in today's hearing, have you not?

A. Yes.

Q. Let us turn to your first exhibit, Exhibit No. 1. Could you describe what that is for the record and explain it for the Examiner?

A. We have set out the proposed location

of our Yates Petroleum Corporation Hanlad "AKZ" State No. 2 well. It's shown to be located in Section 13, and we've attempted to show the offset oil and gas operators and some of the wells that have been drilled in the area.

Q. Mr. Bullock, I notice that within the south half of Section 13, which is the proposed proration unit for the Yates Hanlad "AKZ" State No. 2 well, there is this dry hole. Was this a well that Yates Petroleum drilled or participated in or had anything to do with?

A. No. This was a well that was drilled and operated by Manzano Oil Corporation.

Q. All right. The acquisition of this acreage, could you give the Examiner just a brief history of how Yates came to control the south half of Section 13?

A. This acreage was put up on the October 1991 state land sale. It came up on the competitive oral portion of the sale, and Yates acquired it at that land sale on an oral bid situation with BHP and Manzano being present.

Q. Did they actually compete with Yates in the acquisition against Yates?

A. That's correct.

Q. After the acquisition were there any problems or things that had to be accomplished before Yates could propose a well to be drilled on the acreage?

A. Yes. The Commissioner of Public Lands requested that Yates purchase the existing surplus equipment from the existing operator prior to issuance of the lease. And so we did not get the issuance of the lease at that time. We were obligated by statute to negotiate with the prior operator before issuance of the lease was given to us.

Q. When was the lease actually issued, Mr. Bullock?

A. The lease was issued January 16 of 1992.

Q. Mr. Bullock, I would ask you to turn to Exhibit No. 2, and could you tell us what that exhibit is?

A. Exhibit No. 2 is a Certificate of Mailing that Yates sent to the offset operators, being Collins & Ware, Inc., and BHP Petroleum Americas, Inc.

Q. And these two operators were the ones that the rules of the OCD require notice to be

given of an unorthodox application being filed; is that correct?

A. Yes, that is correct.

Q. And those were the only two that were required under the rules to have notice given to them?

A. Yes, that is correct.

Q. And Exhibit 2 then is a composite of not only your letters with the return receipt information, a listing showing the addresses of them, and then the Affidavit of Compliance with Rule 1207; is that correct?

A. That is correct.

Q. With respect to the two notices that were sent out, were any waivers obtained, Mr. Bullock?

A. Yes. Collins & Ware, Inc., signed the waiver. That is our Exhibit 3.

Q. All right. Now, Collins & Ware, what acreage do they own? How were they affected?

A. They own the offset acreage to the south, to the west in Section 14.

Q. All right. And this proposed location is unorthodox towards their direction?

A. That is correct.

Q. All right. And we did not receive a waiver from BHP; is that correct?

A. That's correct.

MR. CARROLL: Mr. Examiner, I would move admission of Exhibits 1, 2, and 3 at this time.

EXAMINER STOGNER: Are there any objections?

MR. BRUCE: No.

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

MR. CARROLL: I have no further questions of this witness.

EXAMINER STOGNER: Thank you, Mr. Carroll.

Mr. Bruce, your witness.

MR. BRUCE: Just two quick questions.

EXAMINATION

BY MR. BRUCE:

Q. Mr. Bullock, on Exhibit 1 the acreage that's marked "State Acreage," that's all state minerals, I take it?

A. That's correct.

MR. BRUCE: I think that's it, Mr. Examiner.

EXAMINER STOGNER: That was only one.

MR. BRUCE: I miscounted. Higher math.

EXAMINATION

BY EXAMINER STOGNER:

Q. Now, on Exhibit No. 1 Mr. Carroll asked you about a plugged and abandoned well. Are you referring to the one that's marked as the Rault and Hanlad State No. 1 Well?

A. Yes, sir.

Q. You said that was drilled by Manzano?

A. Manzano was the last operator of the lease. I'm not sure whether they spudded it. They were the operator we had to negotiate purchase of the surface equipment with.

MR. CARROLL: Mr. Examiner, for your information, I have reviewed the title on that well because of the problem. And Rault actually drilled the well; Manzano succeeded at some later date as operator and were operators at the time production ceased. And the lease was actually lost because of nonproduction from that well.

Q. (BY EXAMINER STOGNER) Mr. Bullock, do you know when that lease was lost by Manzano?

A. No, I do not know the exact date. I

believe it was sometime in 1991, but I do not know the exact date in 91.

EXAMINER STOGNER: Okay. Are there any other questions?

MR. STOVALL: Yes.

EXAMINATION

BY MR. STOVALL:

Q. Has that well been plugged?

A. To my knowledge it has been.

Q. It has? Yes?

A. It has been plugged.

Q. They left equipment on it?

A. It's been subsequently plugged. Yeah, the equipment was on the lease on the well.

Q. I mean did Yates plug it, or did Manzano plug it?

A. I'm not sure.

MR. STOVALL: That's all right. It's not critical.

EXAMINER STOGNER: Any other questions of this witness? If not, he may be excused.

Mr. Carroll.

MR. CARROLL: I would next call Leslie Bentz.

LESLIE BENTZ

Having been duly sworn upon her oath, was examined and testified as follows:

EXAMINATION

BY MR. CARROLL:

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

A. Yes. My name is Leslie Bentz. I'm employed as a geologist by Yates Petroleum Corporation of Artesia, New Mexico.

Q. Ms. Bentz, have you had an occasion to testify before the OCD in other hearings?

A. Yes, I have.

Q. And were your credentials examined, and were you approved as an expert in the field of petroleum geology at that time?

A. Yes, they were.

Q. Are you familiar with the application that Yates has now pending before this Examiner?

A. Yes, I am.

MR. CARROLL: Mr. Examiner, I would tender Ms. Bentz as an expert in the field of petroleum geology for the purposes of testimony in this hearing.

EXAMINER STOGNER: Are there any objections? Ms. Bentz is so qualified.

Q. (BY MR. CARROLL) Ms. Bentz, I know you've prepared a number of exhibits. Could you give us a brief overview, though, of this particular area and the problems that you have found and are associated with drilling for oil and gas in this particular area?

A. Okay. Well, substantial geological testimony and numerous geological interpretations have already been presented to the Commission as evidence in the original unorthodox application for the BHP Puffer State, the discovery well of the undesignated gas pool, and in the application of Collins & Ware for an unorthodox gas location, and that was Case 10344.

And many elements of these different interpretations have been very compatible, and other points have been very contradictory. And it's believed by myself that the source of the contradiction is that they have kind of oversimplified the geologic picture.

Data available was seismic data from BHP, from Collins & Ware, from Stevens Oil. A joint BHP-Yates' line is actually the line that led to the discovery of the original well. And proprietary seismic data owned by Yates and all

extant well data has also been used.

Q. Now, Ms. Bentz, we heard just a moment ago that this lease was just recently acquired. In fact, the lease was not granted by the State Land Office until January of this year. After its acquisition, did Yates do any further geophysical work out in this particular area?

A. Well, we purchased one seismic line and traded for four others during the time that the title was still not completed. And upon the time that the title was completed and we got issued the lease, then we proceeded to contract a seismic crew and shot two more proprietary lines.

Q. So this has all been accomplished in the first five months of this year or less than five months?

A. Yes. Right, we took from January until April to actually get a crew in Chaves County.

Q. I take it then from what you tell me Yates has actively pursued this particular prospect and has done it with dispatch, I would take it, then?

A. Yes, we have.

Q. Now, with that, Ms. Bentz, you have prepared some exhibits which, I believe, would

help show the points that you wish to make geologically. I'll ask you to turn to your first exhibit, Exhibit 4, and could you explain, describe it for the record, and then tell us what it shows and how it relates to the Yates' application?

A. Exhibit 4 is a structure map prepared on the Pre-Penn unconformity. The contour interval is 50 feet. The black contours illustrate the top of the Pre-Penn that represents the top of the Mississippian Formation.

The red contours are representative of or very near the top of the Ordovician Formation. If the Mississippian is thin to, say, less than 30 or 40 feet, then seismically that is essentially the same top. You cannot see the Mississippian.

Mississippian subsea elevations are shown in blue, and the Siluro-Ordovician elevations are shown in red. The purple circles represent seismic shot points and the values derived from the seismic.

All the wells in the area have been spotted, and our proposed location is spotted.

The map shows that there are three distinctive styles of faulting in this area. The blue indicates normal faulting. The green shows strike-slip, or wrench faulting, and the red shows -- defines high-angle reverse faulting.

It is this very distinctive nature of the faulting that provides conclusive evidence of the tectonic nature that resulted in the substantial accumulation of reserves in this area.

The normal faults represent the oldest active faulting in this area. They were formed as the Proto-Permian Basin began its subsidence.

At or very near the end of the Mississippian, early Pennsylvanian as the ancestral Rockies were uplifted, this area was compressed. And as the compression curved, you had folding against this fault. As the lateral compression continued, eventually you had strike-slip movement along old sheer zones in the area.

Ultimately the compression was such from the wrench faults that at this active zone of compression either were two wrench faults converging or they're stepping. Finally the

whole zone ruptured and this whole area was upthrust.

And the odd nature of this, the bulging and then the tears at the end of it, are very indicative of an upthrust. And after this block was up-thrust, the Mississippian was then eroded off the high block.

So essentially your seal on the down-thrown side is provided by the Mississippian and the Pre-Penn Clastics. But sometimes when you map on the Pre-Penn unconformity, it looks like you're not losing very much structure in one direction. On the Pre-Penn unconformity you really aren't, but you have essentially a couple hundred feet of Mississippian sitting in there, so it's really a throw of a couple hundred feet. But it's very tough to map on the top of the Silurian.

Q. Ms. Bentz, judging from what you've just told us, then the trapping mechanism is a combination of faulting, of the various kinds of faulting, and also stratigraphy; is that correct?

A. Yes, it is.

Q. I also notice that this area is -- there have been a number of dry holes drilled in

this area.

A. Yes, they have.

Q. Have you taken that into consideration? Does that play a part in your determination or the geologic picture that you've --

A. Well, I've used all the well control, but the main thing the wells provide is good velocity control and good ties into the seismic so you know exactly what you're doing with the seismic.

Q. These dry holes out here, they have all -- or at least all these well attempts, they have all been unorthodox locations too, have they not, trying to close in on this particular pool that we're looking at here?

A. Well, the unorthodox locations, the first one would be the Rault Petroleum well was unorthodox at 666-660. The BHP well was unorthodox. And the Collins & Ware pooling, which ended up being operated by Manzano, was also unorthodox.

I believe the nonproductive one in Section 24 is orthodox and the nonproductive well in Section 23 is orthodox.

Q. Are there any other statements that you would like to make with respect to your Exhibit No. 4?

A. The only other comment I'd like to make is the area shaded in red indicates the productive area.

Q. All right.

A. The productive area is completely defined by the upthrust block.

Q. Let us turn to your Exhibit No. 5. Would you explain what that is for the record and then give us an explanation of how it relates to the application that Yates has before the Division?

A. Exhibit No. 5 is a map of Wolfcamp Shale, which is the shale located immediately above the Cisco, and so it represents earliest Permian. And the reason this map was constructed is compressional forces were reactivated again in the latest Pennsylvanian, very earliest Permian.

And this has reactivated the wrench areas, and it has created even more en'echelon wrench faults, but they all bound to the root. But what it does, it has a tendency to start changing the overall grain of your structural

picture.

Q. Are there any other comments that you'd like to make with respect to Exhibit No. 5?

A. No. I think I'll wait and talk about both maps after I do Exhibit 6.

Q. All right. Would you turn to Exhibit 6 and again for the record explain what this exhibit is and then if you would tell us how it relates to the application?

A. Exhibit 6 is a structural map on top of the San Andres. And again this area was reactivated post-San Andres and has become even more complicated with these right lateral en'echelon wrench faults.

And the reason it's important is nearly everyone in Chaves County uses seismic isochrons from the top of the San Andres to the top of the Pre-Penn. So when you do that, you subtract your San Andres structure away to derive at your Pre-Penn.

So what these two maps really illustrate is to get a real good accurate picture of the Pre-Penn, you have to map more than one horizon: map the San Andres, map the Wolfcamp, and then work from the Wolfcamp down to the

Pre-Penn. And after you've totally reconstructed this, then you have an accurate geological-geophysical picture.

Q. Anything else?

A. One other thing I'd like to comment is that by the time you get to San Andres, your structure is more of east-west orientation in the overall north-south than it was during the Pre-Penn. And this has to do with the en'echelon folding with the wrench faults.

Also from the Pre-Penn, through the Wolfcamp, through the San Andres, your area of closure has continued to migrate westward. And this would be expected as the basin was tilted to the southeast.

Q. All right. Anything else?

A. No.

Q. Okay. If you would turn to your Exhibit No. 7 and if you would describe for the record what it is and then how it relates to the case.

A. Exhibit 7 is northwest-to-southeast trending structural cross-sections through the pertinent wells in the area. The first well in the section is the Manzano well that was just

recently drilled, and it was plugged and abandoned. It shows a very thick Mississippian section and ran 150 feet so low to other interpretations that's been presented.

The second well is the Rault Hanlad State. This well is interesting in the fact that the well drilled into the up-thrown block and unfortunately crossed one of the high angle reverse faults, encountered a repeat Mississippian section, and ended up on the down-thrown side of the fault. But that's important because that really helps narrow down exactly where that bounding fault is to the northwest of our well.

The next fault shows how these wrench faults or right lateral strike-slip faults end up tying into the deeper, older faults in the area. When you cross this, the high angle reverse fault, you'll notice the curved nature of it. That is real common with an upthrust, and you see that on seismic as well.

The next is our proposed location, and our proposed location shows that we should be essentially flat to within 20 or 30 feet down-dip of the BHP Puffer well.

And finally from the Puffer well to the Rault Union State shows that you've crossed the other bounding fault, gone down-dip. One other thing I'd like to point out is how thick the Mississippian is on the down-thrown side versus how thin it is on the up-thrown or upthrust block.

Q. Any other comments that you'd like to make with respect to your Exhibit No. 7?

A. No. One other comment I'd like to make, the gas-water contact is approximately minus 2500 feet, which is pretty much synonymous with the edges of the up-thrown block, and I think that's been testified by and agreed on by Collins & Ware and BHP.

Q. Judging from some or most of your comments that you've been making today, it seems that with a high degree of predictability or correctness that you have been able to delineate where are the limits of this producing pool that we're attempting to hit; is that correct?

A. Yes, I have.

Q. And that's very important with respect to today's case, is it not, especially if in fact the Division decides to place a penalty upon this

unorthodox location; is that correct?

A. Yes, it is.

Q. Ms. Bentz, have you studied the penalties that have been given in this area and based on a geologic standpoint do you have an opinion with respect to that issue that will be faced by the Division?

A. Yes, I have.

Q. Would you, please, give that to the Examiner?

A. Well, in my opinion at this particular point in time, that if we drilled our well that we in no way would harm BHP. In fact, we've probably already suffered harm by the BHP well. The only thing that we can do at this point is start protecting our own correlative rights.

Q. When you use the word "harm," is that synonymous with the word "drainage"? We have suffered drainage; is that what you're alluding to?

A. Yes. Movement of gas reserves under our lease that right now only can be recovered by the BHP Puffer well.

Q. In fact, Mr. Boneau, who will testify today, will go into a much greater detail but

develop those very issues; is that correct?

A. That's correct.

Q. Now, with respect to the gas that's presently still in place and if the Division were to find it necessary in their opinion to place a penalty on it, rather than not place one as you have suggested, what is the realm there of reasonableness in your mind and why?

A. Probably within 15 to 35 percent.

Q. Now Bentz, your last exhibit, Exhibit 8, that was basically a typed-up synopsis of the testimony?

A. Yes, it is.

Q. That's just rendered as an aid to the Examiner?

A. Right.

Q. Are there any other comments that you would like to address to the Examiner that I may have overlooked asking you or asking you for?

A. I would like to kind of present a conclusion.

Q. If you would, please do that.

A. It's very evident that the tectonic history is real complicated, and there's been many geological interpretations, a lot of them

have a lot of the same points.

And from my interpretation it becomes obvious to me that Yates Petroleum has sufficient reserves to drill the well. And I think it's very unfortunate that we have to be up here asking for a 330 location. I don't like to do that on 320-acre spacing, but in this particular instance because of the way the geology is I don't think we have any other choice.

I also went over our lease form, and it pretty much compels Yates Petroleum to, if an offset well is drilled that is capable of draining an offset lease, that you either have to drill a well and protect the correlative rights or you have to pay compensatory royalty. In the absence of either of those, then your lease would be canceled.

In this particular instance I think it's real unfortunate the lease survey does not conform to the geology better, because I know there have been at least five different operators ask for five different unorthodox locations in this area.

And so I really think that we have no choice but to drill a well at a 330 location, as

the BHP well has been producing for nearly a year, that they probably won't have any drainage from us, but if we don't drill our well and drill it soon, then our lease will begin to become drained by the Puffer State.

Q. Ms. Bentz, then in your expert opinion the granting of the unorthodox location application made by Yates Petroleum, would that in your mind and professional opinion prevent waste and promote correlative rights?

A. Yes, it would.

Q. With respect to your first opinion that you feel that no penalty should be assessed in this particular case, do you feel that that opinion is based upon a fair assessment of and protection of the correlative rights of not only Yates Petroleum but BHP?

A. Yes, I do.

MR. CARROLL: Mr. Examiner, I would move admission of Exhibits 4 through 8, and I would pass the witness.

EXAMINER STOGNER: Are there any objections?

MR. BRUCE: No.

EXAMINER STOGNER: Exhibits 4 through 8

will be admitted into evidence.

Mr. Bruce, your witness.

EXAMINATION

BY MR. BRUCE:

Q. A couple of preliminary questions. You said you purchased and traded seismic data. Who did you trade or purchase it from?

A. Purchased data from Stevens Oil, traded seismic data with BHP.

Q. When did you purchase and trade the data?

A. Approximately December, January.

Q. Okay.

A. Early in the year.

Q. Have you mapped this area before Yates bought the lease?

A. Yes. In fact, in January of 1990 BHP and Yates Petroleum jointly shot and paid for a seismic line that led to the discovery of the Puffer well.

Q. Looking at your Exhibit 4, if your mapping is correct, have you calculated the acreage of the production, the productive acreage in the formation?

A. I have not personally calculated, but I

have seen the number.

Q. Has Mr. Boneau calculated it?

A. Yes, he has.

Q. In looking again at Exhibit 4 and based on your mapping, isn't the standard location available?

A. No, it's not.

Q. Moving into the east and slightly to the north?

A. And you're probably looking at trying to hit about a little 10-acre wedge in there that is at least 75 feet down-dip, so I don't think that's a real -- I don't think that's available.

Q. Okay. So you have some question about the placement of your fault lines?

A. No. But anytime you drill that near faults, they dip. If you'll notice from our cross-section, it bulges in the middle and then dips off toward the faults.

Anytime you drill very, very near faults, you encounter deviation problems, expensive drilling costs, and numerous increased risk, which in fact from other times of looking at BHP's maps, I always wondered why they didn't drill a west half spacing unit and drill an

orthodox location.

Q. Well, that would have required them to move substantially to the south, wouldn't it?

A. Right.

Q. Right near your fault line?

A. Right. I said from my interpretation I understand why they did. But that way you get a 660 location from our lease line with no penalty.

Q. Would you say that BHP took substantial risks in drilling that additional well?

A. They did take risks, but the nature of these is the development wells are nearly as risky as the discoveries. I think Manzano took considerable risk resulting in a dry hole.

Q. Just a couple more questions. You talked about compensatory royalty. You heard Mr. Bullock testify that both Yates' lease and BHP's lease are state acreage, are they not?

A. [Nodded.]

Q. So regardless of who produces the hydrocarbons, the royalty will go directly to the state; isn't that correct?

A. That's correct, but I have no idea as to the state leases which different agencies

receive moneys from which different leases. I can't assume that it's equitable.

Q. And I think you started off by saying this is a difficult area to interpret?

A. Yes, it is.

Q. Is there any room for disagreement between two geologists?

A. There's room for disagreement, but I've really got nearly every seismic line available out there. And my interpretation is really not so different from BHP's original interpretation.

MR. BRUCE: I don't have anything else, Mr. Examiner.

MR. CARROLL: I have.

EXAMINER STOGNER: Thank you, Mr. Bruce.

Mr. Carroll, redirect?

FURTHER EXAMINATION

BY MR. CARROLL:

Q. In the vein that you just were talking, Ms. Bentz, you have reviewed the geology that BHP put together when they actually presented their case to the Commission and their interpretation at which time they had an unorthodox location approved; is that correct?

A. Yes.

Q. And that unorthodox location was approved without a penalty; is that correct?

A. That's correct.

Q. And the interpretation that they used in that presentation with respect to the amount of productive acreage or the pool that -- or that part of the pool that lay up in Section 13, which is now owned by Yates, did it differ at that point in time or differ significantly?

A. Not substantially.

Q. Was the amount of productive acreage approximately the same as shown in that interpretation --

A. Yes.

Q. -- as is now shown in yours?

A. Yes.

Q. And is it a fair statement that the additional seismic and drilling that has occurred out there actually has worked to substantiate that original picture rather than to contradict that original picture?

A. Yes, it has.

MR. CARROLL: Thank you.

EXAMINATION

BY EXAMINER STOGNER:

Q. Ms. Bentz, looking at Exhibit No. 4 --

A. Okay.

Q. -- you show your various shot lines. Can I tell by looking at this when these shot lines were run and what dates?

A. No, you can't. But I'd be glad to walk through each line.

Q. If you have that information, yes, I would like that.

A. Okay. Line 85, that 30-005-85, the one that goes northwest to southeast --

Q. The one that ends with .220?

A. The one that ends -- right.

Q. Okay.

A. That's probably one of the earlier lines out there.

Q. When you talk "early," how early?

A. That would have been in probably 1990, January of 1990.

Q. How about one of the later ones?

A. Okay.

Q. How about the main north-south one, the BHP?

A. The BHP 9 line, I would assume that

line was probably shot, I think it was shot maybe right after they drilled their discovery well or about that time.

Q. When we talk about the discovery well, we're talking about the one in the northwest quarter-northwest quarter of 24; is that right?

A. Right, the only Siluro-Ordovician producer.

Q. What was that again?

A. I call it Siluro-Ordovician. I disagree on exactly the formation name.

Q. I'm going to get to that too.

A. Okay. The latest line shot, or the one marked 102 and the one marked 103, 30-005-102 and 103, those were the two lines shot by Yates in April of this year.

Q. Okay. I've got the 102. What was the other one?

A. 103. It pretty much parallels that original 85 line that goes northwest to southeast.

Q. Okay. That would have been also in April of 92?

A. Uh-huh.

Q. In looking at that Rault Petroleum

Corporation Hanlad State No. 1 in the southwest-southwest of 13, that was drilled -- I don't show a spud date on that. Do you know by chance when that well was drilled or what information was available to them when that well was drilled as far as the shot lines go?

A. Probably very little data. It was drilled in the 80s, so there could have been other data available, maybe the one Stevens line, but the rest of the data is of real recent vintage.

Q. So we're even looking at that January 1990 line, which you said was one of the older ones on here, that wasn't even available to them?

A. No.

Q. That well is at an unorthodox location also, isn't it?

A. Yes.

Q. I want to make sure I understand on Exhibit No. 7. You have the Mississippian designated in purple?

A. Uh-huh.

Q. And then we come over here, and I believe you called -- is that a reverse fault or --

A. Yes.

Q. -- that Rault Petroleum, you're showing two faults?

A. That's the high angle reverse. That's the edge of the upthrust. The other fault shows one of the right lateral wrench faults which ultimately connect into this upthrust.

Q. Then immediately past that, your proposed well, which you show the water, the gas, the Woodford Shale, and the Mississippian --

A. Uh-huh.

Q. -- and the Mississippian, like you suggested, was very much thinner in this area, but then again you also said that there was a lot of erosion on top of that Mississippian; is this correct?

A. Right. Probably at one time the Mississippian on this up-thrown block was as thick or nearly as thick as it was on the down-thrown. But when it was uplifted at the Pre-Penn unconformity, it was eroded away. So that pretty much sets the age for these faults.

Q. I want to make sure we're all talking about the same formation here. I have it, the application was for Precambrian, and I call it a

granite wash?

A. Okay. The Precambrian is where we will TD the well.

Q. Okay. You show that as the upthrust. And it looks like the BHP Puffer State No. 1 penetrated the Precambrian; is that correct?

A. That's correct.

Q. When we look at the Siluro on your -- what is that? What are we looking at? What kind of a deposit? Is that a granite wash?

A. No. No. The Siluro-Ordovician is just a shelf dolomite, passive margin shelf dolomite. It's continuous but in Chaves County you're getting near its sub-crop edges. So where other places in the basin you can actually distinguish it into formations, it's somewhat questionable exactly what formation it is in this part of Chaves.

Q. What is that pool name that the BHP well is producing out of?

A. As far as I know, it's undesignated.

MR. BONEAU: Undesignated Chaves --

MR. STOVALL: Please.

Q. (BY EXAMINER STOGNER) Because all parties are here today objecting and the

application was for Precambrian, I don't see any problem with the advertisement, so I'm going to let that go as is.

But I'm assuming and what we are talking about is this Siluro-Ordovician pool, formation, once it does get designated -- whatever the case may be -- I'm sure once I hear from BHP's geologist, I will have a better understanding about what we want to call it. I would like to get some sort of a nomenclature out there from today's hearings, and we can pinpoint what we're talking about?

A. Sometimes you designate it as Fusselman, and sometimes you designate it as Montoya, and sometimes it's designated Ellenburger. And it's probably in fact one in all the same.

MR. STOVALL: And they accuse lawyers of not coming up with definitive statements.

Q. (BY EXAMINER STOGNER) But as I understand it, you're calling it a --

A. Siluro-Ordovician to designate the age of it.

Q. Is that capital S, capital O? Is it hyphened?

A. Silurian, like Siluro-Devonian. We're just dealing with the Siluro-Ordovician.

Q. For my own understanding, you said some call it Fusselman, some call it what else?

A. Montoya.

Q. And?

A. And some call it Ellenburger.

Q. All those formations are in the Siluro-Ordovician Age?

A. Age.

Q. When did all this activity occur?

A. Beginning activity --

Q. Looking at the --

A. The normal faults?

Q. Yes.

A. The normal fault probably maybe even started moving in Cambrian, through Devonian, and maybe a little adjustment even into the Mississippi. Compression started in very, very latest Mississippian or very earliest Pennsylvanian. That's pretty well documented from the big unconformity there. There is a hiatus of deposition.

The next movement would have been late Pennsylvanian, very early Permian, Wolfcampian.

That's pretty well documented for New Mexico.

And the final movement is Post-San Andres. It could be tertiary; it could be numerous things; but it is Post-San Andres deposition.

Q. One final question. The gas which you show, what kind of deposition are we looking at here? Is that a deep water or marine?

A. No. Just passive shelf margin. Just nice shelf dolomite. It may have even been uplifted a little bit prior to the deposition of the Mississippian. You get such good porosity, it's probably been karsted.

EXAMINER STOGNER: At least there's no potash around here. Okay. I have no other questions of this witness. Are there any other questions of Ms. Bentz?

MR. STOVALL: I just have one.

EXAMINATION

BY MR. STOVALL:

Q. If you look at your cross-section, I mean it appears to me that the BHP well is in the thickest and highest part of the gas; is that correct?

A. Well, it's definitely in the center of

the block, but the block really doesn't dip very much until you get to the very edges of the block. So there is a good chance that we could be flat and have just about as much column as they do, probably within 20 or 30 feet.

MR. STOVALL: That's all I have.

EXAMINER STOGNER: Any other questions of Ms. Bentz? If not, she may be excused.

Mr. Carroll.

MR. CARROLL: We next call Dave Boneau to the stand.

MR. STOVALL: Is it true Mr. Boneau is going to identify the pool for us?

MR. CARROLL: He knows.

DAVID F. BONEAU

Having been duly sworn upon his oath, was examined and testified as follows:

EXAMINATION

BY MR. CARROLL:

Q. Would you, please, state your name for the record and by whom you're employed?

A. My name is David Francis Boneau. I'm employed by Yates Petroleum Corporation as a reservoir engineering supervisor.

Q. Mr. Boneau, have you had occasion to

previously testify and have your credentials examined and accepted as an expert in the field of reservoir engineering?

A. Yes, sir.

Q. Mr. Boneau, are you familiar with the application that is presently before the Examiner, and have you had an occasion to review the materials available to Yates Petroleum with respect to this area?

A. Yes, sir.

MR. CARROLL: Mr. Examiner, I would tender Mr. Boneau as an expert in the field of petroleum reservoir engineering for purposes of testifying on behalf of Yates with respect to its application.

EXAMINER STOGNER: Are there any objections?

MR. BRUCE: I don't think so.

EXAMINER STOGNER: David F. Boneau is hereby qualified.

Q. (BY MR. CARROLL) Mr. Boneau, you have prepared a number of exhibits for submission to the Division, the Examiner, are there any opening statements, though, that you would like to make to kind of tie your testimony in with the earlier

previous testimony given by Ms. Bentz?

A. Yes. I'm going to talk about penalty factors. My testimony will be that 30 percent is the highest penalty factor that makes any sense. Yates has an argument that zero penalty factor would be correct. And that argument is that zero penalty is required if Yates is going to recover the gas that was originally under the Yates' acreage.

Some of that gas has moved as the Puffer well has been produced. A 30 percent penalty will enable Yates to produce the gas that now remains under our acreage. That's different from the gas that was originally under our acreage, but that seems to me a sensible proposition.

If you go to a higher penalty, BHP and the Puffer well will continue to produce gas that is on the Yates' lease today, and so we will suffer further drainage. And I would submit that a higher penalty factor is totally inappropriate.

I will also discuss briefly a penalty-setting formula that has been used in the past by the NMOCD and show that this three-part

formula says that a 30 percent penalty is plenty high also.

Q. Mr. Boneau, let us turn to your first exhibit, which is Exhibit No. 9. Would you identify what it is and then explain how it relates to Yates' application?

A. Exhibit 9 shows a somewhat blown-up picture of the productive area according to the Yates geology, which Ms. Bentz presented. You can see the location of the Puffer State well in Section 24. The Yates location is marked "Yates" in Section 13.

The total area of this productive reservoir is 151.3 acres containing a total of 7.25 Bcf of gas. Section 13 contains a little over 40 of those acres and approximately 1.95 Bcf of that gas. The numbers for the other section are shown there.

But we'll discuss in the following exhibits or exhibits where these numbers came from, the acreage numbers came from planimetering the productive areas shown on Section 9. The gas in place comes from some further calculations which we'll discuss shortly.

Q. All right. Mr. Boneau, this is the gas

in place prior to any development, any drilling; is this correct?

A. That's what those numbers are intended to show, original gas in place divided up among the various sections.

Q. Are there any other statements you'd like to make with respect to your Exhibit No. 9?

A. No, sir.

Q. All right. If you'd turn to Exhibit 10, and again would you describe what Exhibit 10 is for the record, and then if you would explain its application or relationship to Yates' case?

A. Exhibit No. 10 contains three pages. There's quite a lot of information concerning the existing Puffer well and the reservoir. At the top of the page, just as an aside, the pool has been in the records as Chaves Undesignated Group 4-A. That's an oil pool, and there is some confusion there, I think, but that's where it is in the records.

Under Item A, I have production data, which is simply the production data through April for the Puffer well, the only producing well in the pool. The cumulative production as of May 1, 1992, was 1.08 Bcf of gas. And the production

rate for that well has been a little over 4 million cubic feet per day.

Item B shows some reservoir data that is used in the calculations. The perforations in the Puffer well are from 6371 to 6452. The reservoir temperature is 128 degrees. The initial pressure from BHP data is 2450 PSI.

The gas compressibility factor, so-called Z factor, is that number .838, and that's detailed on Exhibit 10 here. That's a relatively minor point, but it's pinned down in detail there.

And the gas formation volume factor is 175.8, so that a cubic foot of gas in the ground is 176 cubic feet of gas on the surface.

In Part C I've summarized all the log analyses that anyone wants to do. But the Puffer well in my analysis, and of course there could be some disagreement here, but I've analyzed them as best I could, the Puffer well has 88 feet of net pay with a porosity of about 10 percent, high gas saturation, .73 on average.

And the SgPHIh, the hydrocarbon pore volume, associated with the Puffer well is at 6.255 feet. So equivalently there's 6.25 feet of

void space filled with gas under the Puffer well.

If we turn the page, we start to get to the meat of the subject. What I've done is take the case of a 30 percent penalty and go through -- I'm looking for drainage areas -- and go through the production to date, which is noncompetitive, only the Puffer well is producing, and then go through future production where the Yates well is allowed to produce at 70 percent of the rate of the Puffer well.

So I'm talking about 30 percent penalty. That would allow the Yates well to produce at 70 percent of its deliverability. And I'm assuming that the Yates well will be as good as the Puffer well. And that's probably as good as it's going to be. It's not going to be any better than the Puffer well. So I'm assuming it's going to be a good well in doing these drainage calculations.

So Part D details the future production and the future acres drained, and I'll go through that. The equations at the bottom of the page simply take that reservoir data and calculate the area swept as a function of the amount of gas

produced.

So up to May of 1992, we have real production numbers from the Puffer well, and its total production is 1.076 Bcf. And that is all the recoverable gas, and I'm assuming 90 percent recovery factor. That's all the recoverable gas in 25 acres.

The Yates well in any estimation could go on-line September 1 of 92. By then the Puffer well will have produced the 1.593 Bcf and will have produced all the recoverable gas in 37 acres.

And I'm assuming that from September 1, 93, on the new well drilled by Yates and the BHP well will be producing simultaneously and competing.

The next line shows where we are at the first of 93, 1/1/93. And I'm assuming that the BHP well has dropped to 4 million a day, and during that same time the Yates well will be producing 70 percent of that 2.8 million a day.

On January 93, the BHP well has drained all the recoverable gas in 45-1/2 acres, and the Yates well has drained 6 acres.

I hope you're getting the idea by now,

but there's only three more lines. We can go through those hopefully fairly soon. Six months into 1993, actually I guess that should say 7/1/93 because that's how I calculated it, the BHP well will have drained 62 acres and the Yates well, 17.8.

At the start of 94, the BHP well is up to 75 acres and Yates is up to 26.7. And at the start of 95, the BHP well is up 87.7 acres and the Yates well, at 35.6. And at that point the Yates well is done.

In our picture there's more reservoir to the south which the BHP well will drain. I think in the BHP picture there's way more reservoir to the south. The BHP will drain all of that. Yates will get none of any production to the south.

The numbers in the Table D here, I think, make more sense if we go to the next picture where it's shown what's going on in a pictorial sense. Can we go to Exhibit 11?

Q. Certainly. If you would identify for the record exactly what this is and then discuss its applicability?

A. Exhibit 11 is a picture of the

productive area. The case is for a 30 percent penalty on the Yates wells, and it shows the areas that are drained at the six different dates that I just went through from Exhibit 10.

So what's happening is that as of May 1, 92, the BHP well had drained 25 acres, and we see a circle around the Puffer State No. 1 that's labeled 5/1/92. That drainage area is all on the BHP lease.

By September of 1992 that circle will have expanded, as shown on Exhibit 11, and it crosses over onto the Yates lease. Then the Yates well starts producing and the two wells are competing. By the end of 1992 there's a line at the top and bottom that shows 1/1/93, and that's the area that will be drained in Section 24 and part of Section 13 by the Puffer State well.

And there's a smaller circle about the size of a quarter around the Yates well. That's the six acres that the Yates well will have drained by the end of this year. The circles, by the end of this year, the drainage areas have met and the two wells are bumping into each other.

From then on the drainage areas have to expand east and west. And the drainage areas for

7/1/93, and 1/1/94, and 1/1/95 are shown on Exhibit 11. The drainage area for the Yates well as of 1/1/95 hits the west boundary and the east boundary of the reservoir, and the Yates well will then cease production.

If there is -- well, the reservoir to the south of my 1/1/95 line in Section 24 will be drained by the Puffer State well in subsequent periods. And if BHP were right and that reservoir extended further south, that Puffer well would get all that gas.

I think it's clear to everyone that the BHP well could drain this reservoir by itself. I don't think that's in dispute. It could drain this reservoir by itself.

This 30 percent penalty case that's shown on Exhibit 11, the Yates well will produce 1.5 Bcf of gas out of the 1.95 that was originally in place under the Yates acreage.

I think it's wise to notice on Exhibit 11 that there's a line that separates the Yates drainage area from the BHP drainage area. It's hard for me to describe in words where that line is. But it starts at the west edge of Section 13 about a quarter inch above its corner with the

other four sections and extends east and includes a portion of the BHP lease.

So that I think the Yates well will get some gas from the eastern part of the lease; the BHP well will get gas from the central and west portions of the Yates lease.

So I have detailed a scenario where a 30 percent penalty operates over the next few years, Yates drills a good well, produces it at 70 percent of its capacity and gets approximately the gas that's now under its lease.

Q. Mr. Boneau, before we move on to your next exhibit, let me ask you a question. Let us assume that this reservoir that you have drawn here on Section 13, which is the reservoir underlying the Yates acreage, it has a peak over here to the east side and north of the Yates well.

Let us suppose that that reservoir wasn't there and that in fact there is a fault intended to go across there and cut off that corner, say a triangular section of it. Would that affect materially the scenario that you have described with respect to how the two wells, the Puffer State No. 1 and the Yates No. 1, will

interfere with each other, and will that affect materially your hypothesis that the Yates well will not drain gas over and from, materially from the section, or the lower section, Section 24?

A. I think I understand your question. The Puffer State well has produced enough gas that it's right at the edge of the Yates lease. The Yates well needs to be drilled and start producing, and it will compete with the Puffer State well, but that competition is going to be at the, what I'm calling the edge of the Yates lease. It's going to be approximately on the line I've drawn on Exhibit 11 within reason regardless of the size of the reservoir on the Yates lease.

The competition will be between the Puffer State and Yates will not be materially affected if a portion of the gas on the Yates lease does not exist. Yates simply will not get that gas to the northeast if there is no gas to the northeast.

But the fact that the Puffer State is such a good well and has such a time advantage, it is already up to the Yates lease, and that composition at the boundary will be relatively

unaffected by the size of the reservoir on the Yates lease.

Again if we're wrong and the reservoir on the Yates lease is smaller than we're saying, it's half as big as we're saying, the Yates well will only get half as much gas as is here, and the Puffer State well will get very close to the same amount of gas that I'm protecting here.

Q. Do you have any other comments with respect to Exhibit 11?

A. No, sir. I'd like to go to the next one.

Q. All right. If you would describe for the record what Exhibit 12 is and tell us how it relates to the Yates case.

A. Exhibit 12 attempts to summarize what we did on Exhibit 11 for a 30 percent penalty along with similar cases for a zero percent penalty or a 75, a large penalty.

What I've shown here is again the productive area with the well locations. The important thing is that I've drawn three lines that are the lines of interference between the drainage areas of the Puffer well and the Yates well. One is labeled zero; one is labeled 30

percent; and one is labeled 75 percent.

The line labeled 30 percent is the same line that was on Exhibit 11. If no penalty were invoked on the Yates well, the drainage areas of the two wells would meet along the line labeled zero, and the Yates well would produce 1.8 Bcf of gas. With the 30 percent penalty case, the Yates well would produce 1.5 Bcf of gas.

If a higher penalty, a 75 percent penalty were imposed, Yates could not recover a large portion of the gas on its lease and the line of interference would be the one that's marked 75 percent, and the Puffer well would produce quite a lot of the gas from the corners of the Yates -- from the east and west corners of the Yates well. The total production from the Yates well would be about 1 Bcf of gas.

This picture ties in with my original statement that zero or 30 give Yates gas that was originally on its lease. A large penalty, in the range of 75 percent, does not enable Yates to recover anywhere near the gas that's on its lease. And I attempt to illustrate by this that 30 percent is the highest reasonable penalty, and a huge penalty in the 75 percent range is totally

inappropriate.

Q. Mr. Boneau, with respect to the issue of correlative rights, which this Division is charged with protecting, a penalty of zero then, in your opinion, would that be the most advantageous route to take in order to protect correlative rights and protect each of the parties' interest in the gas that actually existed under their leases prior to the beginning of drilling?

A. I think the strict answer to your question is yes. A zero percent penalty would enable Yates to essentially take back from BHP gas that's already moved over there. The 30 percent penalty that I've outlined would enable Yates to have a fair shot at the reservoir as it exists now.

The reservoir pressure has surely dropped from 2,450 to the range of 2,000 pounds, and that's pretty much spread throughout the reservoir. The gas has simply moved. Some of the gas has moved to the BHP lease.

The 30 percent penalty will give Yates a chance to get the gas that's there now. If we're going to get the gas back that used to be

there, we need no penalty at all.

Q. In your opinion then any penalty assessed greater than 30 percent, that would then adversely affect the correlative rights of Yates Petroleum and the owner of the minerals or the royalty interest; is that fair?

A. A penalty greater than 30 percent clearly hurts the correlative rights of the owners of Section 13.

Q. With respect then to Exhibit No. 12, is there anything else that you'd like to comment about?

A. No, sir.

Q. I'd then ask you to turn to your Exhibits 13 and 14. They appear to be different examples of the same kind of analyses. Would you mind telling us what those two exhibits are and then explain their relationship to the case?

A. Exhibits 13 and 14 attempt to outline a three-part penalty factor that's been used; it's kind of a cookbook approach by the NMOCD from time to time. And the earliest record of it I found was back in 1978.

I'm not endorsing it. In fact, I've argued against it in some other cases, but it's

something the Commission has used and I thought it would be informative to go through that procedure for this reservoir to get an idea of the kind of penalty factors that maybe fit in with previous NMOCD custom.

So I feel I need to go through the three parts of No. 13 so that we're clear what we're talking about. And Exhibit 14 is a simple modification of that.

So there are three parts to this penalty factor, and I'm going to apply it on Exhibit 13 to the Yates well. First of all, there's a north-south factor, which I have called "Pa," the first penalty factor. And it relates the distance from the edge of the lease in the north-south direction for an orthodox location with the actual distance.

And the actual formula there is the distance from the south line of the orthodox location minus the distance from the south line of the actual location divided by the distance from the south line of the orthodox location. For the Yates well, which is 330 from the south line and it should be 660, that factor is 0.5.

The second factor is an east-west

factor, exactly similar idea. Distance from the west line of the orthodox location minus the distance from the west line of the actual location divided by the distance from the west line of the orthodox location. The Yates well is 1225 from the west line. The orthodox location is 1980. And that "Pb" factor is 0.38.

The third factor I've called "excess area." I think that's the word that's been used in the past. And what you do is draw a circle containing 320 acres, the spacing unit area, around the actual location and the orthodox location, and you determine the area that is outside the orthodox circle but inside the circle that surrounds the actual location. That area for the Yates well has been colored in in blue.

And the third penalty factor is simply a ratio of that excess outside the orthodox circle area to the 320 acres for the spacing unit or for the orthodox circle. Here the blue area is 74 acres. And that "Pc" factor is 0.23.

The final step to get the answer that we've all been waiting for is to add up those three, those three penalty factors, and divide by 3. So we add up .5, .38, .23, and divide by 3,

and the answer is 0.37. And that translates into a 37 percent penalty factor.

So the point of Exhibit 13 is that this method would penalize Yates to the tune of 37 percent. Everyone notices that this method has nothing to do with actual drainage areas of wells. It's based simply on the locations of the wells and on the size of the spacing unit.

Exhibit 14 then is the same exact analysis applied to the Puffer State location. And the result is that this method would have given the BHP location a penalty factor of 25 percent. In actuality the BHP location has zero penalty.

And I guess I would submit as a conclusion that this surely supports that the 30 percent is plenty high for the Yates location in view of the fact that 37 is not very much bigger than 30 and the BHP well got zero penalty.

Q. Mr. Boneau, then with respect to the issue of the prevention of waste and the protection of correlative rights, the granting of this application for an unorthodox location, by granting that do you feel that the Commission would be preventing waste and promoting

correlative rights?

A. Yes. Clearly Yates needs to drill a well to get any shot at correlative rights in Section 13.

Q. Then with respect to the issue of correlative rights and the penalty, is it then your opinion that to protect correlative rights that the most advantageous or proper method would be to grant this unorthodox location with zero penalty; is that correct?

A. It's correct that that would grant Yates an opportunity to get the gas that was under its lease.

Q. All right. And then is it further your opinion that any penalty larger than 30 percent would in fact harm correlative rights and would not allow Yates to produce -- would in fact allow someone else to produce gas that was from or existed under Section 13?

A. That's correct. Frankly I'm not sure that the Commission is going to give us zero penalty, but we've got a real strong argument that 30 percent is as high as it should go.

Q. Mr. Boneau, do you have any further statements that you would like to make to the

Examiner concerning your testimony and exhibits?

A. I don't believe so. I think he's got the message that we've done quite a bit of work here, and it looks like 30 percent makes sense.

MR. CARROLL: Mr. Examiner, I would move admission then of Exhibits 9 through 14.

EXAMINER STOGNER: Are there any objections?

MR. BRUCE: No.

EXAMINER STOGNER: Exhibits 9 through 14 will be admitted into evidence.

MR. CARROLL: I would then pass the witness.

EXAMINER STOGNER: Mr. Bruce, your witness.

EXAMINATION

BY MR. BRUCE:

Q. Dr. Boneau, turning to your Exhibit 9, just a little simple arithmetic, your estimate is 1.95 Bcf is located on the Yates lease; is that correct?

A. Yes, sir.

Q. That would be, and you can calculate it if you want, that would be 27 or 28 percent of the reserves in that particular pool?

A. Yes, sir.

Q. And similarly if you just looked at acreage, you'd get a similar figure, wouldn't you?

A. Yes, sir.

Q. And even if you have a total of 7.25 Bcf, even if you subtracted what BHP has currently produced or has produced to date, I should say, you'd still have 1.95 Bcf out of a little over 6 Bcf and the reserves on Yates lease would be about 30, 32 percent of the total reserves in the pool?

A. I think I understand your figure. Obviously you can't actually do that. The gas doesn't stay on our lease --

Q. Sure.

A. -- while you produce. But Yates originally had -- the reserves that Yates originally had are about one-third of the remaining gas in the pool.

Q. Okay. And moving on to Exhibit 10, just a couple of questions. Page 2, a point of clarification regarding Yates' proposed well -- has the initial producing rate of 2.8 million feet a day. That's based on 70 percent of what

BHP is producing?

A. Yes, sir. That's based on the idea that our well is as good as your well, which I think is real presumptuous of us, and it's based on the idea that the reservoir is quite permeable so that the condition around our well is going to be similar to yours.

The only reason your well dropped in productivity with time is the pressure goes down. And I'm assuming our well would be like your well, and it will then have the same deliverability as your well, take 70 percent of that.

Q. Another question on that exhibit. Are you saying that January 1, 95, would basically be the end of production for both wells?

A. No. No. I'm saying it would be the end of production for the Yates well, and all the production after that would come out of the Puffer State well. And it was not of interest for the competition between the wells to carry it on beyond that.

Q. So you wouldn't quite, looking at the proposed Yates well, you wouldn't quite recover according to you 90 percent of the original

1.95 --

A. No. No.

Q. -- 1.95 Bcf?

A. No. No. This 30 percent penalty will not recover 90 percent of the gas that was on our lease. What I'm saying is it will recover 90 percent of the gas that's on our lease now after some of it has moved -- after relatively little of it has moved off.

Q. I was just trying to understand where you got that figure. That's all.

And moving on to your Exhibit 11, once again I forget what you've called it, but the no-flow line, the line between -- more or less the horizontal line crossing between Yates' well and the Puffer State well, that's based on Yates producing at 70 percent of BHP's producing rate?

A. Yes. That's based on exactly the same thing as in that table that we just talked about on page 2 of Exhibit 10.

Q. And if Yates' well was producing at a higher rate than BHP, then that no-flow boundary, would that move to the south?

A. In Exhibit 12 is just -- that well is -- the zero penalty is the Yates well

producing at the same rate as the BHP well, and that no-flow line has moved south as shown on Exhibit 12.

I guess if you're asking if we've got twice as good a well as you, yeah, it would move south, but do you really expect that?

Q. And moving back to Exhibit 10, page 2, again how did you derive the recovery factor?

A. The 90 percent?

Q. Yes, sir.

A. I said that 90 percent is a nice recovery factor for a good gas reservoir.

Q. Does that --

A. It depends how the -- I don't think there's any conflict that 85, 90, 92, something like that is the kind of recovery factor. It depends how low you can pull the pressure and whether you put a compressor on your well. I did it down to about 150 PSI.

I don't know if you guys will operate your well down to 300 PSI or down to 50 PSI, but the recovery factor is going to be 93 to 85 percent. And any number within that range will give the same results for all the other pictures.

Q. Does this recovery factor take the water contact line into account?

A. I think I know what you're asking. My calculations are all for a pancake reservoir -- is what they look like. In my mind it's not a pancake reservoir, and that's not what I'm calculating. But the numbers are -- there's equal gas under every bit of area.

The water contact is at the edge of the reservoir, and I don't view that as a real factor. The reservoir does dome a little, does bend down a little and is thinner on the edges. I think you're getting to that.

And I justified what I did because the best porosity in the reservoir is at the top. And so even on the edges, you're going to have all that best porosity in the reservoir. Leslie tells me there's some evidence that even down-dip you get a little better porosity on the edges.

So by these kind of general arguments, I convinced myself that the edges of the reservoir were as good as the sides, as the middle, in terms of gas in place.

Q. Just a couple final questions. What is Yates' well cost estimate? Do you know, or do

you have roughly an idea?

A. I've not seen an AFE, but roughly it's going to be $500-, $600,000.

Q. Are there any additional costs outside of the well itself, I mean facilities' costs that would have to be added in?

A. Minor ones. I do not know where we would sell the gas, and their hook-up costs sometimes are significant. But other than that $600,000 ought to cover what it's going to cost.

Q. And now Yates bought this lease knowing that BHP had already been draining the reservoir to some extent?

A. The Puffer State well started in July and was drilled earlier than that. By October the word should have gotten to us. Yes, sir.

MR. BRUCE: Thank you, Dr. Boneau.

EXAMINER STOGNER: Any redirect?

MR. CARROLL: No, sir.

EXAMINER STOGNER: Points of clarification, Dr. Boneau.

EXAMINATION

BY EXAMINER STOGNER:

Q. I take it this is a 100 percent water drive reservoir?

A. No. There is some water underneath it. I do not view the water drive as active at all. I'm not going to tell you zero, but my calculations neglected the water drive, and I think that's a reasonably accurate picture of what's going on. The Puffer well has produced zero water.

Q. So it's essentially the pressurized zone?

A. It's a -- yeah, it's an isolated reservoir filled with gas -- is the best simple approximation of it.

Q. In an ideal world, if both of these wells were owned and operated by the same individual party, would there be a problem with one well producing less or its production curtailed, would you have water encroachment in any way? What would it do to the pressure?

Would you still get the same amount of gas out if this hold-back -- if this one well were pinched back for some oddball reason in the simplistic, idealistic situation I'm coming up with? Or would there be any gas left in the ground if both wells were not able to perform to their capacity?

A. The reservoir has quite good transmissibility, permeability, and I don't know that there is no water drive, but there's a minor water drive. When you have a water drive, the best operating procedure, the best you can do is to produce as fast as you can in all cases I've looked at, as long as you don't cone in the water and try to outrun the water. You get the most gas out if you try to outrun the water.

So if you had a strong water drive, you would be better off producing both wells as fast as you could.

Q. But you don't have a strong water drive?

A. I don't think we have a strong water drive. In the absence of a strong water drive, it doesn't matter what you do to any substantial amount. You could take -- I'm convinced that the Yates well could drain all this acreage, or clearly the Puffer State well could drain this whole reservoir.

In an ideal world somebody would probably unitize it or share the ownership so you only drilled one well.

MR. STOVALL: Write that word down.

EXAMINER STOGNER: Unitize with a capital "U."

Q. Are you familiar with any regional drip out there as far as the well that is actually drilling and in such an active geologic area? Have you had any experience with that?

Or perhaps I should ask one of your other witnesses, Mr. Carroll?

A. Whether you can drill vertical wells, really vertical? Is that what you're --

Q. How much off are we going to be?

A. I don't know the drift on the Puffer State well. Probably BHP does. But I'm the least qualified person in the room to answer other than the lawyers probably.

MR. CARROLL: I think Ms. Bentz may have some information.

EXAMINER STOGNER: Ms. Bentz?

MS. BENTZ: As you long as you drill near the top of the structure, there's probably slight dip. And so probably I would suspect you would not get over a degree or two of deviation. If a well was drilled on the very edge of it where the beds were steeply dipping, you could have a deviation problem, and it would move

up-dip.

EXAMINER STOGNER: So regardless it would move away from the lease line if what you tell me is correct?

MS. BENTZ: The bed -- your hole will drift up-dip. So depending on where the most localized up-dip is is which way it would go. And I suspect in this well, unless we for some reason get tied up in a fault which would pull us away from the lease line probably, we wouldn't have any real deviation problems.

EXAMINER STOGNER: I'm going to reserve coming back with that question to Yates perhaps after I hear the BHP testimony. The worst possible case scenario would be a deviation survey or a directional survey in this instance since we are talking 330 feet.

I have no other questions.

MS. BENTZ: We do those routinely as we drill anyway, not necessarily -- just a deviation survey. If you go over 3 or 4 degrees deviation approaching 5 degrees, as outlined by the state, then we would routinely do a directional survey. But one or two degrees we generally don't do a directional survey.

EXAMINER STOGNER: Okay. Are there any other questions of Dr. Boneau? If not, he may be excused. Let's take another 20-minute recess. Since it's hard to get into a restaurant around here at noon, we will come back after our 20-minute recess and finish this up and then we can all go eat on our merry way later on this afternoon.

[A recess was taken.]

EXAMINER STOGNER: This hearing will come to order.

Mr. Bruce.

WILLIAM J. MORRIS

Having been duly sworn upon his oath, was examined and testified as follows:

EXAMINATION

BY MR. BRUCE:

Q. Would you, please, state your name and city of residence for the record?

A. My name is William J. Morris. I reside in Woodlands, Texas.

Q. And who are you employed by in this case and in what capacity?

A. I'm a consulting geologist employed by BHP Petroleum to represent their geological

interests.

Q. Have you previously testified before the Division as an expert petroleum geologist?

A. Yes, I have.

Q. Are you familiar with the geology involved in this case?

A. Yes, I am.

MR. BRUCE: Mr. Examiner, I tender Mr. Morris as an expert petroleum geologist.

EXAMINER STOGNER: Are there any objections?

MR. CARROLL: None.

EXAMINER STOGNER: Mr. Morris is so qualified.

Q. (BY MR. BRUCE) Mr. Morris, would you, please, refer to Exhibit 1 and discuss the contents of that for the Examiner?

A. Yes. Could I get a copy of it?

Q. No.

A. I could talk from memory but -- Exhibit 1 is a map on top of the Montoya dolomite that I prepared for this hearing. BHP's acreage is shown with the yellow outline. Yates' is shown with the green. The three wells circled in blue are Pennsylvanian gas wells that have produced at

one time or another. And the well colored in red is the BHP Puffer well, and the red circle represents the unorthodox location that Yates is seeking in this application.

The red shaded area is the area that I believe is where the gas is contained in this reservoir. It's based on the log of the BHP well. I believe the gas-water contact to be at approximately minus 2550.

The faults that I have interpreted on this map here are basically north-south trending faults, which is pretty typical in this area that most of the Montoya-Ordovician production has followed along these north-south trending faults. The map shows that the BHP well is producing from a north-south trending fault.

Q. Now, Mr. Morris, I just made a reference that you've done this several times. There have been three separate cases, have there not, involving wells in this area?

A. This is the third one, I believe, yes.

Q. And the first one was initially for BHP's proposed well; is that correct?

A. That is correct.

Q. The second case involved the Collins &

Ware well in the southeast quarter of Section 14?

A. That's right.

Q. And this would be the third case; is that correct?

A. That's exactly right.

Q. Has your geology remained substantially the same throughout this?

A. Basically it has almost remained exactly the same other than the placement of a few faults which have been changed based on additional well control and seismic data.

Q. For instance, the fault that runs from the northeast to the southwest into Section 23, you initially had that more -- or I should say at the Collins & Ware hearing you thought that well was more east to west, did you not?

A. I placed it in there east to west based on the fact that they had shot some seismic data in there and at their location they were trying to get into the same reservoir that we were in.

Q. And they didn't get into it?

A. No. That's right. That well was down-thrown.

Q. Now, you were here and listened to Yates' geologist testify, didn't you?

A. Yes, I did.

Q. Do you consider her interpretation radically different from yours?

A. Not really. Hers is a more complicated interpretation of the same basic geology and stuff. I don't have -- I can't really disagree with everything that she says. She presented a fine case for her geological model.

Q. Two geologists would disagree to a certain extent on some issues, perhaps just like two attorneys; right?

A. In this case I think any two geologists would come up with a slightly different picture using all of the same data.

Q. Now, in your opinion when BHP drilled the initial well in this pool, did it take quite a risk?

A. It took considerable risk, I believe, yes.

Q. And in your opinion should there be a penalty on production on BHP's well?

A. Absolutely not. BHP -- there were three wells that have already been drilled to the Montoya formation prior to BHP drilling a well. And BHP, based on their seismic data that they

had shot, chose the location in the center of these three wells. And there was considerable risk drilling in the center of three wells.

Q. Based on your interpretation, what is the thickness of the Montoya at your location?

A. The entire dolomite section out of which the BHP well is productive is a total of, like, 400 feet total. I believe the total gas column, which you may be interested, is somewhere like 170 feet.

Q. Does your interpretation give a similar thickness at the Yates' location?

A. Yes. I show it to be relatively flat. It could come in high or low.

Q. Okay. And that would also agree with Yates' geologist, would it not?

A. Yes, it would.

Q. Would you, please, move on to Exhibit 2 and discuss the faulting in the area in more detail?

A. Okay. This cross-section is the same cross-section or contains the same wells that the Yates' geologist presented, and I believe the picks are quite similar, almost exactly the same as a matter of fact.

I made this cross-section to document the faulting in the area. I've made a little bit simpler interpretation from what Yates has made out here. But you can see that the Rault well in Section 24 is clearly down-thrown to the BHP well in the same section. And they're less than a mile -- well, they're less than a half a mile apart.

So it's been my experience out here that most of these are near-vertical faults, high-angle reverse faults, if you will. And based on the seismic data, I believe that fault is pretty close to that Rault well. And I have that fault cut shown approximately at shot point 270 or so, 273, something like that on the map.

The other fault, major fault that I show, also shows approximately 200 feet of displacement. And that's in the Rault well in Section 13. And basically Yates is trying to drill their well just on the up-thrown side of that fault.

Q. What is the total vertical displacement on the faults?

A. I don't have the exact number, but it's approximately 200 feet. It may be 250 feet

total.

Q. Is that a substantial figure for displacement in Montoya in this area?

A. Yes, it is. It's quite substantial. Most of the production out here is from a similar type of -- similar type fields, but the throw on the faults is generally around 100 feet or so.

Q. What is BHP requesting in this case?

A. BHP is requesting that the Commission protect their correlative rights and not allow Yates to produce any gas that is on BHP's leases.

Q. Is BHP objecting to the drilling of the well?

A. No, they are not.

Q. But what are they requesting?

A. We are requesting the protection of our correlative rights on our lease.

Q. By means of a penalty assessment?

A. That's exactly right, yes.

Q. And will the engineer discuss that in a few minutes?

A. I believe so.

Q. Final question, Mr. Morris. What about, there's been some discussion previously about drift in the well. Do you have any

comments on that?

A. Basically I agree with what Yates' geologist said. If there is substantial dip in the area, the well will drift in an up-dip direction. In this case it would probably be towards the lease line.

Q. Towards the south line of section --

A. Towards the common boundary of the two leases. And that's assuming that their well would come in down-dip.

Q. But it might be flat?

A. It could be flat, yes. I believe in the BHP well that we had a maximum deviation at the bottom of the hole of around 2 degrees.

Q. Were Exhibits 1 and 2 prepared by you or under your direction?

A. Yes, they were.

Q. Is the granting of this application with a penalty in the interests of conservation and the prevention of waste?

A. Yes, it is.

MR. BRUCE: Mr. Examiner, I move the admission of BHP Exhibits 1 and 2.

EXAMINER STOGNER: Are there any objections?

MR. CARROLL: None.

EXAMINER STOGNER: Exhibits 1 and 2 will be admitted into evidence at this time. In reviewing the cross-section -- I'm sorry.

Mr. Carroll, I'm sorry about that. Your witness.

MR. CARROLL: Just a couple of questions.

EXAMINATION

BY MR. CARROLL:

Q. Mr. Morris, referring to your Exhibit No. 1 and the main north-south trending fault, which runs --- it's the black line going up and down your exhibit that runs very close to the proposed location, when BHP proposed its unorthodox location to the Commission and is the first case that you referred to, the fault or that very fault actually was drawn more to the east of where it is and in fact angled in an easterly direction; isn't that correct?

A. I believe that's right, yes.

Q. So not only has the fault line that runs from the west to the east just above and intersects that north-south line changed from your picture, but also this north-south has

changed then?

A. That's right.

Q. Both faults?

A. That's right. Since BHP drilled their well and stuff, they shot additional seismic data, BHP line 91-9, which is a north-south line, and BHP line 91-8, which is an east, basically an east-west line that goes through Sections 13 and 14. We shot those and that gave us the control to move the fault further to the west.

Q. Were those lines the ones that were traded to Yates Petroleum?

A. Yes, they were.

Q. So you are aware that Ms. Bentz in her interpretation had the advantage of both of those lines?

A. Absolutely.

Q. Now, Mr. Morris, when you were talking with Mr. Bruce a minute ago about BHP taking considerable risk in drilling this particular well, you're not alluding to or trying to tell or take the position that because BHP took considerable risk that they should be entitled to produce gas that does not underlie their acreage, are you?

A. Oh, no. No, I didn't intend that.

Q. And wouldn't you also agree that in this particular area a development well, if we can call the Yates well a development well, are also extremely risky or almost as risky as the very first well that BHP drilled?

A. It is almost as risky but not quite because BHP has found there to be gas production there. So that does lessen their risk.

Q. And with respect to correlative rights, your understanding is that each lease owner or operator should have an opportunity to produce the gas that underlies his particular lease?

A. Absolutely.

MR. CARROLL: That's all I have.

EXAMINER STOGNER: Mr. Bruce, any redirect?

MR. BRUCE: No.

EXAMINER STOGNER: I'm glad I let you ask that question.

EXAMINATION

BY EXAMINER STOGNER:

Q. You heard Ms. Bentz' testimony concerning the age, and I'm looking at the possibility of finally getting a pool name

designated to this. You call it Montoya?

A. Yes.

Q. Do you have any problem with the Siluro-Ordovician Age of this particular rock?

A. Montoya is Ordovician Age rock. I don't have a problem with calling it Ordovician. I may have some problems calling it Silurian.

Q. Is there Silurian out here, or is that's what's between --

A. Based on my interpretations for the entire area, the Silurian is not present in this part of Chaves County. It would be present further to the east. But like she said, it's not real easy to tell.

Q. When you talk Silurian, are you talking formation or an age?

A. I'm talking age in this case.

Q. Okay. So in your opinion there's no Silurian Age rock?

A. I believe all of the lower Paleozoic rocks in this area are Ordovician in age, possibly Cambrian.

MR. STOVALL: Mr. Bruce, I don't think it's attorneys disagreeing. I think it's attorneys speaking for geologists disagreeing.

THE WITNESS: Generally the state calls these reservoirs Pre-Permian in age and stuff. And I don't really like that real well.

EXAMINER STOGNER: It's Post-Precambrian.

I have no other questions of Mr. Morris at this time.

MR. STOVALL: I have one question I'd like to ask him.

EXAMINATION

BY MR. STOVALL:

Q. Am I correct in my looking at your interpretation and Ms. Bentz' that probably one of the most significant differences is -- it looks like she's got kind of a reverse fault and wrenching fault that defines the southern limits of the reservoir?

A. Yeah, that would be the major differences and stuff. But I talked to BHP's geophysicist this week, and he felt like there was evidence to bring it even further to the south in Section 24, possibly into 25 or 26. Now, I didn't really examine the data after he said that or anything. But he mentioned that he could make a case for that.

And where you pick these faults and how you pick them is very interpretational, and I think Ms. Bentz would agree with that.

MR. STOVALL: I have no other questions.

EXAMINER STOGNER: Thank you. You may be excused.

Mr. Bruce?

MR. BRUCE: I'm surprised Mr. Stovall is asking geological questions.

MR. STOVALL: Once in a while.

EXAMINER STOGNER: No, you're not surprised.

MR. STOVALL: I think my geological question is: Isn't your red area a little different shape than his red area?

EXAMINER STOGNER: Mr. Bruce.

JULIE ANN FERRERO

Having been duly sworn upon her oath, was examined and testified as follows:

EXAMINATION

BY MR. BRUCE:

Q. Would you, please, state your name and city of residence for the Examiner?

A. My name is Julie Ann Ferrero. I live

in Houston, Texas.

Q. And who are you employed by and in what capacity?

A. I work for BHP Petroleum. Currently I'm a reservoir engineer.

Q. And have you previously testified before the Division as an engineer?

A. No.

Q. Will you, please, outline your educational and work experience?

A. I graduated from Penn State University with a bachelor of science in petroleum and natural gas engineering in 1989. Shortly thereafter I started working for BHP. I've been working for them for about two-and-a-half years, and I'm their reservoir engineer for the southwestern region, which handles southwest Texas and southeast New Mexico.

Q. Are you familiar with engineering matters related to this case and to the Puffer State well?

A. Yes, I am.

MR. BRUCE: Mr. Examiner, I tender Mr. Ferrero as an expert petroleum engineer.

EXAMINER STOGNER: Are there any

objections?

MR. CARROLL: None.

EXAMINER STOGNER: Miss Ferrero is so qualified. Is it --

THE WITNESS: Mrs. Ferrero.

EXAMINER STOGNER: Mrs. Ferrero.

MR. BRUCE: F-e-r-r-e-r-o, Mr. Examiner.

EXAMINER STOGNER: Thank you, Mr. Bruce.

Q. (BY MR. BRUCE) First off, at what rate is BHP producing its Puffer State well?

A. It's currently producing around 4 million a day. It's about 50 percent of its potential.

Q. So the well is actually capable of producing about 8 million a day; is that correct?

A. That's right. The AOF for the well was 7.9 million.

Q. Why is BHP producing at only 50 percent of its potential?

A. We believe that if we produce it at a higher rate, water encroachment will occur, which would reduce our sweep efficiency and leave reserves behind causing economic waste.

Q. Now, you were sitting here listening to Yates' engineer testify, were you not?
A. Yes, I was.
Q. And I believe the engineer testified that if a penalty was assessed, the penalty should only be 30 percent; do you recall that?
A. Yes, that's what he said.
Q. Do you think this request is reasonable?
A. His request was 30 percent of what BHP is currently producing it at.
Q. A 30 percent penalty?
A. Yes.
Q. And so, in other words, a 70 percent allowable; right?
A. That's right.
Q. If it was 70 percent of the wells, if the allowable was fixed at 70 percent of Yates' well's potential, do you think that would be fair?
A. Of the Yates' well potential?
Q. Yes.
A. No, I do not.
Q. Why not?
A. We are currently producing at 50

percent of the potential, and if they had a lesser penalty than we're even producing our well at, I don't think that -- that penalty to us is meaningless.

Q. It could result in the Yates well producing at a higher rate?

A. Right. They would produce it -- we are, if you want to call what we're producing at as a 50 percent penalty, then they would have a 30 percent penalty, which would be that much less than ours and they would be producing at a higher rate than we are.

Q. BHP has a self-imposed penalty at this time?

A. That's correct.

Q. If Yates is allowed to produce at the rate that it suggests, in your opinion could that harm the reservoir?

A. Yes, it could. I believe that it would reduce the sweep efficiency of the reservoir.

Q. In summary, what does BHP -- what type of penalty does BHP request against the Yates' proposed well?

A. BHP isn't opposed to Yates drilling a well, but we do think that a 75 percent penalty

would be applicable.

Q. That would be based on the well's potential?

A. The Yates' well potential, yes, that's correct.

Q. Would you refer to Exhibit 3 and discuss its contents for the Examiner?

A. These are production penalty calculations that I have made. The first one, "(a) Based on reservoir area" is using our maps. And it shows, BHP Exhibit No. 1 shows 17 acres in Section 13, the Yates section. And I have planimetered 271 acres in the entire reservoir shaded in red. And just based on a strict ratio, that would be a 6.3 percent allowable and a 94 percent production penalty.

Part (b) is based on distance. Simply they are -- the Yates proposed location is 330 feet from the common lease line. And our Puffer State location is 660 feet, so that would be a 50 percent penalty.

Q. And 160 feet from the common lease line would be a standard location in the north-south direction?

A. That is correct.

Q. Now, you mentioned that a 93.7 percent penalty, you don't think anybody would drill at that penalty?

A. I do not believe anybody would drill at a 94 percent penalty, no.

Q. I believe you've stated that you don't think anything such as Yates has requested would be fair to BHP; is that correct?

A. That's correct. I believe something in between the 50 percent and the 94 percent would be what we would request, and that's why I've come up with the 75 percent penalty.

Q. And once again that penalty should be based on the potential of Yates' well; is that correct?

A. That's right. And I believe that the well would be tested quarterly and the allowable adjusted accordingly.

Q. Now, Yates presented an exhibit which showed a 90 percent recovery factor. Do you agree with that?

A. No, I do not. I believe that there is a strong water drive in this reservoir. We, based on our mapping at their water contact that Mr. Morris said was 2550, below that we feel that

there are two wells with very good rock quality. And we think that there is a large aquifer. And therefore I believe closer to a 50 percent recovery factor would be appropriate for this reservoir.

I've also included in that 50 percent we have to consider there's nitrogen and CO_2 in the well stream, which that accounts for 6 percent of the well stream. So an additional 6 percent would be taken out of the recoverable reserves.

Q. And that 6 percent of nitrogen and carbon dioxide is shown on the Yates' exhibit, is it not?

A. That's right.

Q. I believe it's Exhibit 10, page 3.

Now, based upon Mr. Morris' mapping, what is your estimate of reserves under Yates' lease?

A. On the Yates' lease, that's 17 acres, 220 million cubic feet of gas.

Q. And even assuming Yates' acreage figure is correct of about 40 acres, that would still only lead to somewhere around 450 Mcf?

A. That's right.

Q. Now, what was the completed cost of BHP's Puffer State well?

A. Half a million dollars.

Q. Were there any other factors which affected well costs, well economics in the BHP well?

A. Yes, there was. We had to build a pipeline at a cost of $501,000 to BHP. It was a two-and-a-half mile pipeline.

Q. Now, assuming a similar cost for Yates and based on -- you picked the figure, either the 220 million cubic or the 450 million cubic feet, at current gas prices, would Yates' well be economical?

A. No, it would not.

Q. How could Yates' well become economical?

A. If they were to drain reserves after the BHP lease, their well could become economical.

Q. Is the granting of the Yates' application with the penalty recommended by you in the interests of conservation, the prevention of waste, and the protection of correlative rights?

A. Yes, it is.
Q. Was Exhibit 3 prepared by you?
A. Yes, it was.
MR. BRUCE: Mr. Examiner, I tender Exhibit 3 to be admitted into evidence.
EXAMINER STOGNER: Any objection?
MR. CARROLL: No objection.
EXAMINER STOGNER: Exhibit No. 3 will be admitted into evidence.
Thank you, Mr. Bruce.
Mr. Carroll, your witness.

EXAMINATION

BY MR. CARROLL:
Q. Mrs. Ferrero, the BHP Puffer well was AOF for something like 7.9 million cubic feet a day; is that correct?
A. Yes. That is what I stated before, yes.
Q. And that is flowing to the atmosphere; is that correct?
A. That is correct. Absolute open flow.
Q. That is not flowing into a pipeline; is that correct?
A. That's correct.
Q. And in fact if you tried to flow -- the

Puffer well is not capable of flowing 7.9 into a pipeline, is it?

A. I'm not certain what the line pressure is, but that's correct.

Q. So the hypothesis that you posed for the Examiner a minute ago, that Yates, if in fact it got a well as good as BHP, it could flow twice as much gas is not quite true, is it?

A. No.

Q. Okay. In looking at the -- I believe it's Exhibit No. 1, do you have a copy of it up there?

A. Yes, I do.

Q. You just made a mention that the problem here that BHP sees for itself is that Yates Petroleum could produce some of BHP's reserves off of Section 24; is that correct, and that's what you're trying to prevent from happening?

A. That's exactly why we're here today.

Q. Now, you're a reservoir engineer, and you heard Mr. Boneau testify. A number of his exhibits established that there will be an interference zone between the two wells. You're familiar with that concept, are you not?

A. Yes, I am.

Q. And that is an accepted concept within the field of reservoir engineering, is it not?

A. Yes.

Q. And in fact you, as a reservoir engineer, know that beyond or, let's say in using the Yates and the Puffer example, this zone of interference, wherever it establishes, Yates is not going to produce gas from south of that zone; is that correct?

A. That's correct. It would be a no-flow boundary.

Q. So if we look at Exhibit No. 1, if this zone of interference is established between the two wells, there is no way Yates Petroleum is ever going to produce any of the reserves that are south of that line or even south of the Puffer State No. 1; is that correct?

A. As long as the Yates well is not producing at a higher rate than the BHP well, that's correct.

Q. Well, in other words, if the Yates well got to producing at a higher rate, then you would have to move that zone of interference south; would you not?

A. That's correct.

Q. But you would never move that zone of interference south of the well itself, would you?

A. No.

MR. CARROLL: That's all I have.

EXAMINER STOGNER: Thank you, Mr. Carroll.

Mr. Bruce, any redirect?

MR. BRUCE: I don't think so.

EXAMINATION

BY EXAMINER STOGNER:

Q. Mrs. Ferrero, you suggested that this was a strong water drive reservoir. Could you elaborate a little bit more on your reasoning on that?

A. It's my understanding that many reservoirs in the same area have strong water drives. And because we believe the reservoir is continuous and we believe that the rock quality is very good -- I'm not sure what these wells are called -- but we believe that the rock quality in these two wells --

Q. You're referring to the two blue wells, one in Section 23 and one in Section 26 of Exhibit No. 1?

A. Yes.
Q. Okay.
A. We believe that the rock quality here, since the top blue in Section 23 well tested water in the same formation, we believe that the water is down to there. And this appears to have very good quality too, and so we think that there's a strong -- or there's a large water aquifer.
Q. You're referring to the well in 26 specifically?
A. Yes. And in December or January, this past year, 1991 or 92, whichever you pick, we increased the rate and produced a little bit of water and so we choked it back.
Q. You believe there's evidence of water coning then in that instance?
A. Coning or cusping, yes.
Q. What is your understanding of the reservoir properties in this zone, porosity, permeabilities? Do you have any figures?
A. Very similar to what they have shown in their exhibits.
Q. You don't dispute that then?
A. Our net thickness, we have 33 feet of

net thickness; whereas, they had a lot higher, 88, I think.

Q. What do you consider the net thickness? The gas void space?

A. The productive gas, yes.

Q. Do you have any indication of where the oil-water contact -- I'm sorry, the gas-water contact is?

A. 2541 is the estimate that Mr. Morris has come up with.

Q. Now, go over those figures with me again. I understand that 7.9 was the open flow to atmosphere --

A. That's right.

Q. -- was the potential for this well?

A. That's right.

Q. What is it flowing or what is it producing now?

A. Four million a day.

Q. Has this been a constant rate that BHP has cut the production down to 4.0 Mcf a day?

A. Excuse me?

Q. How long has this self-induced limiting potential -- has BHP given this well?

A. We initially were producing the well

at, I think, 1 million, and we increased it to 3 million. And I'm not sure exactly when we increased it to 4 million.

Q. What rate did you take it up to when it started showing water?

A. I'm not sure. It's higher than 4 million.

Q. Do you know what the deliverability into the pipeline would be at this point?

A. No, I do not.

EXAMINER STOGNER: Anybody else have any questions?

MR. CARROLL: No.

EXAMINER STOGNER: Mr. Bruce?

MR. BRUCE: I don't think so, Mr. Examiner.

MR. STOVALL: Is that a firm "I don't think so"?

MR. BRUCE: That's a firm.

EXAMINER STOGNER: Okay. Mrs. Ferrero, you may be excused.

Anything else, gentlemen?

MR. BRUCE: The only thing I'd point out, Mr. Examiner, is that I think Mr. Boneau on his Exhibit 10 had some production data. It

looks like the higher production was in January of 92 when they produced at a rate of about 5 million a day, although I don't know what the exact day-by-day rate is. Mr. Morris might have a little information on that.

EXAMINER STOGNER: No one else has anything further? Any closing remarks?

MR. BRUCE: Yes, Mr. Examiner.

EXAMINER STOGNER: Okay, Mr. Bruce. You may go first.

MR. BRUCE: Just very briefly, Mr. Examiner, it's clear that Yates owns a lease containing some reserves in whatever the formation or pool may be. And BHP agrees that Yates in order to protect its correlative rights should be allowed to protect its reserves. However, Yates shouldn't be allowed to produce excessive amounts of reserves and drain the BHP acreage.

Now, there's obviously quite a variation on the reserves under Yates' acreage. BHP estimated 220 Mmcf. Even doubling the productive acres that BHP believes is on that acreage, you only get something less than 500 million cubic feet using that Yates' estimate of

40 productive acres.

We believe that the only way the Yates' well can be economic based on the well costs, pipelines, et cetera, would be for Yates to drain BHP's reserves. And BHP is here today asking for protection from the OCD to prevent that.

We believe that the fair way to protect both BHP and Yates is to allow the drilling of the well but to assess a penalty in the range of 70 to 75 percent of production based on the well's potential.

We believe that this penalty should be recalculated quarterly. The way I get to that penalty is assuming Yates' geologic picture of the reservoir is accurate, they have about 40 productive acres out of 150; that's about 27 percent of the area. A similar figure is derived from using Dr. Boneau's calculation of reserves in the pool and on Yates' acreage; you get 27 percent factor for the reserves under Yates' lease.

Now, Yates requested a penalty based on 70 percent of BHP's current producing rate. However, BHP is producing at about 50 percent of the well's potential because of the fear of the

danger of water encroachment. 70 percent of that 50 percent would result in a 35 percent allowable, or 65 percent penalty.

Based on kind of throwing these figures together, BHP would request a penalty of about 70 percent, 70 to 75 percent, and allowable of 25 to 30 percent based on the well's potential. Any greater allowable, such as the one requested by Yates, we believe will drain BHP, and it may damage the reservoir. Thank you.

MR. CARROLL: Mr. Examiner, I think that it should be quite obvious now that we have heard the evidence that while BHP is complaining that we will be drained, our gas, and we will be hurt because of this drainage if we put this Yates well on, the record is absolutely clean of any evidence to that effect.

BHP did not show any evidence that drainage would occur. I think the evidence is that drainage has already occurred, but it's drainage from the Yates' acreage to the BHP. I do not recall anything that could be even remotely construed to prove or show that Yates could in fact drain.

In fact, Mrs. Ferrero agreed with Mr.

Boneau that the picture that he drew is that we have two wells. They will create an area of interference, and that area of interference is what we have to look at to determine whether or not drainage will occur.

The evidence is very clear that no penalty should be assessed to allow Yates a chance to produce the gas that was in place. Should a penalty be imposed? One, no greater than 30 percent because if you do that, then you are actually changing things out here; you are altering correlative rights; and you are allowing BHP to come in and produce gas from under the Yates' acreage.

I would also like to point out that the analysis that BHP has used is that they have had a self-imposed 50 percent penalty. I think that is almost ludicrous because, one, they are the ones that have all the evidence about what their well can produce into a pipeline.

We did not hear anything about that. In fact, the witness didn't even know for sure how high the well had ever been produced. And yet they want us to believe that this well is producing at its maximum, 4 million, or it's not

producing at its maximum. They want to use, first of all, the figure 7.9. We know that that's unreasonable to even consider because we're talking about apples and oranges.

We have to talk about what the well is capable of producing. BHP, I hope, knows that we did not hear any evidence about which we can judge the credibility of the statement that they have a self-imposed 50 percent. And the only reasons that they have told us that there is a self-imposed 50 percent penalty is because if we do it any higher, we're going to hurt our well; we're going to bring in water; and we're going to create waste.

Well, what is to say that Yates won't operate under the same restraint that BHP is operating? If this is such a critical matter, something that should be taken into effect, and in fact if you did produce it more than 50 percent you're going to create waste, I don't think Yates Petroleum, if that's in fact the state of affairs, is going to want to create waste any more than BHP.

In fact, what it is, both parties are in the same position. And there has been no

evidence presented at all which would put Yates in a superior or a different position. In fact, the evidence says that they should be looked at alike.

And in fact Yates, when it did do its calculations, the reservoir engineering calculations, it assumed that it would get as good a well as BHP. I think experience dictates that that's probably not going to happen. The probability of that ranks down extremely low.

And so the calculations that have been used by Yates have actually already given credit to BHP or allowed them a penalty because they are sitting there on the very edge of the reservoir. We know they cannot be that far from it because of the Rault well. It was a dry hole out there basically that cut the fault. We know that fault there, as Ms. Bentz said, it actually cut it with the wellbore.

So I think the only case and the only evidence before this Division dictates that under the statutes, as they are now proposed, that Yates should have the right to produce the gas that underlay that section. And the only way that Yates can do that is to grant the unorthodox

location and to grant a zero penalty.

EXAMINER STOGNER: Thank you, Mr. Carroll.

Does anybody else have anything further in this case? If not, the Case No. 10489 will be taken under advisement. Hearing adjourned.

[And the proceedings were concluded.]

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10489, heard by me on 11 June 1992.

Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

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

I, Debbie Vestal, Certified Shorthand Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I caused my notes to be transcribed under my personal supervision; and that the foregoing is a true and accurate record of the proceedings.

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

WITNESS MY HAND AND SEAL JUNE 23, 1992.

Debbie Vestal

DEBBIE VESTAL, RPR
NEW MEXICO CSR NO. 3