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

APPLICATION OF MERIDIAN OIL INC. FOR A HIGH ANGLE\HORIZONTAL DIRECTONAL DRILLING ILOT PROJECT, SPECIAL OPERATING RULES THEREFORE, A NON-STANDARD OIL PRORATION UNIT, AN UNORTHODOX WELL LOCATION, AND A SPECIAL PROJECT ALLOWABLE, SAN JUAN COUNTY, NEW MEXICO.	)	CASE NO. 10325

REPORTER'S TRANSCRIPT OF PROCEEDINGS
EXAMINER HEARING
BEFORE: MICHAEL E. STOGNER, Hearing Examiner
June 13, 1991
Santa Fe, New Mexico

This matter came for hearing before the Oil Conservation Division on June 13, 1991, at the Oil Conservation Division Conference Room, State Land office Building, 310 Old Santa Fe Trail, Santa Fe, New Mexico, before Linda Bumkens, CCR, Certified Court Reporter No. 3008, for the State of New Mexico.

FOR: OIL CONSERVATION DIVISION
(ORIGINAL)

BY: LINDA BUMKENS CCR
Certified Court Reporter
CCR No. 3008

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APPEARANCES

FOR MERIDIAN OIL:	KELLAHIN, KELLAHIN & AUBREY Attorneys at Law BY: MR. W. THOMAS KELLAHIN, ESQ. 117 N. Guadalupe Santa Fe, New Mexico 87501
FOR AMOCO PRODUCTION COMPANY and TEXACO, INC.:	CAMPBELL & BLACK, P.A. BY: MR. WILLIAM F. CARR, ESQ. 110 N. Guadalupe Santa Fe, New Mexico 87501
ALSO PRESENT:	MR. BILL HAWKINS
FOR THE DIVISION:	ROBERT G. STOVALL, ESQ. General Counsel Oil Conservation Division State Land Office Building Santa Fe, New Mexico 87504

MR. STOGNER: Come to order. Call case 10325.

MR. STOVALL: Application of Meridian Oil, Inc., for a high angle/horizontal directional drilling pilot project, special operating rules therefore, a non-standard oil proration unit, an unorthodox well location, and a special project allowable, San Juan County, New Mexico.

MR. STOGNER: Call for appearances.

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin, Kellahin & Aubrey appearing on behalf of the applicant, and I have four witnesses to be sworn.

MR. STOGNER: Are there any other appearances?

MR. CARR: May it please the Examiner, my name is William F. Carr with the law firm Campbell & Black of Santa Fe. I represent Amoco Production Company. I do not intend to call a witness.

MR. STOGNER: Are there any other appearances? Will the witnesses please stand to be sworn?

MR. KELLAHIN: Mr. Examiner, my first witness is Chuck Jones. Mr. Jones is a reservoir engineer.

EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Jones, will you please state your name and occupation.

A. Charles A. Jones, and I'm a reservoir engineer for Meridian Oil Incorporated, Farmington, New Mexico.

Q. Mr. Jones, will you summarize your employment experience and your educational background for us?

A. I have a bachelor of science in petroleum engineering from Texas Tech University in Lubbock, Texas, in 1981. Upon graduation I worked for El Paso exploration and Meridian Oil for the last ten years in production engineering, reservoir engineering, and drilling in various states.

Q. Summarize for us your involvement as the reservoir engineer in this project for the drilling of a high angle well in the Huerfano unit.

A. I was part of the technical team that chose locations, designed well bores, and calculated economics for the Huerfano number 300 high-angle well.

MR. KELLAHIN: We tender Mr. Jones as an expert reservoir engineer.

MR. STOGNER: Mr. Jones is so qualified.

Q. (By Mr. Kellahin) Mr. Jones, let me have you turn to the exhibit booklet that we've put together and have you turn to tab six. It says "Exhibit 6," and if you'll fold out the display, help orient us to where we are in the basin when we're looking at this Huerfano unit. Where is this?

A. This is south of Bloomfield, approximately 40 miles. It's close to the Angel Peak recreation area.

Q. The type of production being produced principally from this Huerfano unit is from what pool?

A. It is developed in three or four formations, but we are looking at the Gallup pool for this well.

Q. When we look at this display, identify for us where the particular section is in which you are seeking approval to drill the high-angle well.

A. This is section 31 of township 27 north range 10 west. It's identified by an orange dot in the southeast quarter.

Q. Give us a brief summary of how Meridian, as operator of the unit, has developed the Gallup in this particular unit.

A. The Gallup has been developed on a trend

from the northwest to the southeast to the east of this location, and it's in the thicker part of the Gallup interval.

Q. In relation to this northwest-southeast thickening in the Gallup, where does this particular location lie?

A. It lies on the edge of the productive interval.

Q. When we're looking at the Gallup within the unit, is it subject to any special rules and regulations administered by the oil conservation division?

A. Yes, sir. The Angel Peak, Gallup associated pool has rules that regulate the oil and gas production depending upon the classification of the well.

MR. KELLAHIN: Mr. Examiner, I show you for your information a copy of the associated oil and gas rules. We'll be dealing with the Angel Peak Gallup.

Q. (By Mr. Kellahin) In summary, Mr. Jones, tell us your proposed location with regards to the spacing rules for the associated pool rules in the Gallup for this well?

A. The proposed location of this well is

located in a -- inside the drilling windows for a 320, a gas well location, a gas well drilling window, and it's within the 797 setback associated with that.

Q. Okay. Let's turn to the documentation behind Exhibit number 2. The first is simply a locator plat?

A. Yes, sir. It shows the location of the proposed well in section 31 as it relates to the Huerfano unit itself and Angel Peak Field.

Q. All right. When you characterized this as this "Angel Peak field," is that the Gallup production that you've discussed a while ago?

A. Yes, sir. The Angel Peak Gallup associated field.

Q. All right. And that pod, if you will, that is shaded in red represents the area where you have the wells of greatest productivity?

A. Yes, sir.

Q. Let's go now to C102 which follows that display. Your proposed starting point for the high-angle well is as shown on this display?

A. Yes, sir. It's 1060 feet from the east line and 1450 feet from the south line of section 31.

Q. Do we have an approved surface location for utilizing this specific location for the well?

A. Yes, sir. It's been inspected by the field.

Q. This is going to be drilled pursuant to federal surface and drilling requirements?

A. Yes, sir.

Q. All right. If it's a gas well and associated gas pool, you propose to dedicate the south half to that well?

A. Yes, sir.

Q. Under the associated pool rules, what type of window will you have for offsetting this well from its outer boundaries of its spacing unit? What's your setback going to be?

A. We used 790 from all outside lines.

Q. Okay. Have you a recommendation for the examiner with regards to how to establish a project allowable to this well that is consistent with the rules for allowables in this associated oil and gas pool?

A. We would ask for a special allowable on this particular well that would be the actual deliverability of the well into the pipeline at the pipelines pressure, or two times the gas allowable

of the Angel Peak rules, or four times the allowable of the oil in the event that it's classified as an oil well.

Q. You've summarized that request as the first display following tab Exhibit 3?

A. Yes, sir.

Q. Let's take a moment and explain your request, Mr. Jones, by first of all, having you go back to the associated rules for the pool, and tell us what would be the maximum gas rate at which you could produce this well if it were a conventional vertical well in the pool with 320 acres dedicated to it.

A. The allowable for a gas well in this pool on the 320-acre spacing is based on a calculation of the top oil allowable. The top gas allowable would be 1,000,776 mcf per day.

Q. Take us through the calculation. It is predicated first upon the top oil rate on a daily basis?

A. Yes, sir.

Q. And what is that number?

A. 222 barrels of oil per day.

Q. And you multiply the oil rate times a gas/oil ratio?

A. Yes, sir.

Q. And that gets you the corresponding 1.7 million mcf a day?

A. Also multiplied by ratio of the 320-acre gas spacing unit over the 80-acre oil.

Q. All right. So you have an acreage factor that you put into the allowable calculation?

A. Yes, sir.

Q. The end result of that calculation then gives you the 1.77 million mcf a day that you've shown on this display?

A. Yes, sir.

MR. STOGNER: Excuse me, Mr. Kellahin. Let's get the numbers right in the record. Are we talking about 1.7 million cubic feet a day or 1.7 mcf a day?

A. 1.7 million cubic feet per day.

MR. STOVALL: We've thrown mcf out here, and I think --

A. I've got an extra "M" in there. 1776 mcf per day.

Q. (By Mr. Kellahin) you've got 1.77 million cubic feet of gas?

A. Yes.

Q. All right. We had a hell of a well going, didn't we?

A. Yes.

Q. When we translate under the allowable calculation then, the formula to give you the top gas rate, that gas rate is shown on this display?

A. Yes.

Q. Show me how you have calculated a top oil allowable.

A. The top oil allowable is based on depth in the unit, and at the depth of the original well when the unit was established was, I believe, it was in the 6,000 foot range, and the corresponding allowable for that depth is 222 barrels of oil, which was the top allowable in the unit.

Q. Is it your expectation as a reservoir engineer that we're likely to see an oil well resulting from this effort, or a gas well?

A. We expect a gas well.

Q. The request for a special project allowable is shown on the right portion of the display?

A. Yes, sir.

Q. What is your reason as a reservoir engineer to want the additional allowable assigned to this well?

A. This being a test case, we would appreciate an exception to the allowable because we would not

want our test well to be penalized if it could produce more than the 1.7 million. We would allow -- we would request a cushion to be able to test the well in adequate fashion to ascertain the viability of its technology.

Q. All right. You've given me two answers. Let me separate them into two different questions. In terms of testing the well to derive information for you as a reservoir engineer to judge the success of this project, do you have a plan to test this at various rates of performance?

A. Yes, sir.

Q. If you test the well at its maximum potential deliverability, at least its potential that that deliverability may exceed its gas allowable under the rules?

A. Yes, sir.

Q. All right. What do you gain as a reservoir engineer if you have the flexibility, or the cushion, if you will, of having a bonus allowable by which then to produce this gas?

A. The flexibility will allow us to produce the well at a more official rate to lift liquids and gas, and also to evaluate the completion techniques of the well.

Q. How is that any different than what you might want to do with a vertical well?

A. We believe that the pattern of the well to go across multiple horizons at a high angle will allow us to penetrate more producing zones, and thus increase our produceability of a well.

Q. If you're allowable constrained on your ability to flow gas and thereby lift liquids on this long, lateral extension of this well bore, might it affect the performance of your well?

A. Yes, sir.

Q. And would that officially then preclude you from deriving the maximum amount of data by which to ultimately determine the optimum way to produce these kind of wells?

A. Yes, sir.

Q. Let's go to some of the economics which was your other answer to my question, and if you'll turn to the next portion of display after Exhibit Number 3. Give us a sense of what you're trying to depict here with these diagrams.

A. What we're trying to depict is that a vertical well in this margin of the field will cost $500,000 to $600,000, and will probably be marginally economic, if that. The high-angle well

will penetrate most of the drilling window in the 320, and we hope to encounter fractures in the Niobraro zone.

Q. Okay.

A. And that cost is upwards of 1.5 to $2,000,000 for these wells.

Q. When we're looking at this Gallup, you're specifically targeting in principally on the Niobrara portion?

A. The Niobrara is our main or a target. We will continue on into the Tocito and into the Gallup also if drilling conditions permit.

Q. Is the Niobrara in this area a fractured reservoir that accounts for the productivity of the wells?

A. In the thicker parts of the Gallup field, the Niobrara contributes some production of the main zone of the Tocito with Niobrara usually perforated in addition to that, and in the cases where the Niobrara has encountered fractures, the recoveries have been considerably higher than the regular Tocito.

Q. Okay. Summarize then for us what you see as a reservoir engineer in the advantage of a high-angle well versus another vertical well, if you

will.

A. The high-angle well will encounter more formation, it will also go across these at a high angle to encounter fractures, it will also intercept the Tacito out where the Tocito is thinner and marginal, intercept that at a high angle and increase the exposure of the formation to the well bore.

Q. And you've estimated for the examiner your general range of cost for a vertical well versus the high-angle well?

A. Yes, sir.

Q. Okay. And then the following display summarizes some of the advantages and some of the inherent risks involved in utilizing this technology?

A. Yes, sir. Meridian Oil will drill the Huerfano number 300 in order to prevent waste and improve our drainage efficiency. We will develop this marginal area or attempt to develop the more marginal areas of the field, and we hope to enhance our fracture reception.

Q. Let's go back and explore this notion of waste and development of a marginal area. When we look at section -- what is it, 21?

A. Thirty-one.

Q. I'm sorry. Section 31, and we look at the south half, is there an existing well in that spacing unit?

A. Not in the Gallup.

Q. So the well we see on some of the displays is not one of the Gallup wells?

A. No. There is a PC well that we are adjoining for our surface location, in the southeast.

Q. Have you examined whether it's economically feasible for your company to develop this fringe area of the Gallup within the unit with conventional vertical technology?

A. Yes, we've evaluated this south half. We would not drill a Gallup well in the west half of this drill block because of the marginal exposure to the Tocito and Niobrara, and also we would have to look long and hard at drilling a vertical well in the east half of this. Also it would probably be marginal, so we hope to enhance the going -- enhance our performance by going across the total drill block in the Gallup.

Q. With the horizontal well?

A. Yes, sir.

Q. Okay. I know we have a drilling engineer to discuss the drilling and completion program, but let me have you summarize for us, Mr. Jones, the information shown behind Exhibit Number 4, in terms of the plan for drilling and completing the high-angle well.

A. This exhibit is a plan view, it shows us drilling, setting surface pipe approximately 300 feet. We would then drill with mud down to the top of the Niobrarra, also building our angle at that point to intercept the top of Niobrarra at approximately 5295 tbd 5510 measured depth. Intermediate casing would be set at that point at an angle of approximately 84 degrees. We would maintain that angle upon drill-outs with a motor at 84 degrees across the entire interval to intercept the Niobrara, Tocito, and Gallup.

Q. Turn to the following display which is the plan view. What is the plan for orienting the lateral portion of the well and determining its azimuth, and ultimately the direction and distance that you go?

A. In the Huerfano unit number 300, we've planned this well to try to intercept the inferred fractures at perpendiculaly. This azimuth would

proceed to approximately 277 degrees, our TD would end up within our drilling window. We would stay within the drilling window at all times with the 790 setback.

Q. You desire to have the examiner give you the flexibility to determine the actual distance and orientation of that lateral portion of the well so long as you meet the 790 setbacks to the spacing unit?

A. Yes, sir.

Q. Okay. Well 79, says number 79, is that the Pictured Cliff Well that you referred to a while ago?

A. Yes, sir.

MR. KELLAHIN: I believe that completes my questions for Mr. Jones, Mr. Stogner. We would move the introduction of the displays shown behind Exhibits 2, 3, and 4 at this point.

MR. STOGNER: Exhibits 2, 3, and 4 will be admitted into evidence at this time.

MR. STOGNER: Mr. Jones, referring to Exhibit 3. Now, in this paticular pool, it is an associated pool -- we've established that -- and, for the record, oil wells are spaced on 80 acres and gas wells are spaced on 320 acres, and as your

exhibit shows on Exhibit 3, this 320-acre tract will essentially be four 80's together. Especially if we oriented them up as standups.

As far as your allowable, for a top unit allowable being four times that, I believe that's quite understandable, and I believe you can probably even find that we have done that in past experience and past orders, and of course, then a precedent has been established on that type of a setup.

However, I'm still somewhat apprehensive, questionable, on your deliverability, gas allowable and your double the allowable if it's at 320. Could you elaborate a little bit more on that, and when I ask to elaborate, perhaps touch on the issue of how this would affect the pool overall and correlative rights, and what an allowable in an associated pool establishes?

A. Okay. On the issue of correlative rights, we are within the unit and we are -- the drill block -- surrounding this drill block are in the unit, so that being the case, we do not believe the correlative rights issue is at danger here.

MR. STOVALL: Let me stop you right there. It is a common participating area where the surrounding prorations units are all sharing in production on a

common formula?

A. The Gallup PA, this well would enter into the Gallup PA upon completion. There is a Gallup PA in Exhibit Number 6. The blue-shaded portion illustrates the Gallup PA as it stands now.

MR. STOVALL: Okay. So you would propose bringing the south half of 31 into the Gallup PA?

A. Yes.

MR. STOVALL: What about section 32 and section 6 to the south? They're not part of that PA now; is that correct?

A. Part of 32 is in the PA and as far as I know, section 6 is not in the PA.

MR. STOVALL: Will they be brought in? I mean, they're within the offset tract that would be most affected, are they not?

A. Yes, sir. Upon drilling of another Gallup well, that would be brought in. I do not know if they would be brought in upon geologic inference at this time. We would have to drill the well and evaluate it.

MR. STOVALL: And the north half of 31 would be affected, potentially affected -- I mean, what you've said is that correlative rights of the unit, if there are any units of correlative rights really

are a consideration; however, if I understand this correctly, just because they're in the unit may mean the lease is held, but it doesn't necessarily mean the offsetting tracts participate in the production in a common way, does it?

MR. KELLAHIN: In this case we have Mr. Alexander to address those issues for you, Mr. Stovall.

MR. STOVALL: This witness can answer from the engineering standpoint as far as the effect on production. You made a statement, and I'd like to support that statement with his knowledge of the explanation, and I certainly will give Mr. Alexander a chance to --

A. We do not believe that due to the nature of the formation itself that we will be draining anything other than the 320, if that much. So from that point of view, we do not believe any offset drill blocks will be affected. The north half of section six, at this time, we would not plan to bring it in based on the performance of the 300 well.

MR. STOVALL: Again, all these questions are in the context of essentially asking for a double deliverability factor for a standard gas proration

unit. I think we're finished. What was the rest of your question?

MR. STOGNER: We were touching on the correlative rights and how it would affect the pool overall, and he stated essentially they were within the unit. Being in the unit, would that affect the allowables of all the gas pools overall, and pool ability to produce?

A. No, sir. We do not believe that to be the case because of the tightness of the formation in this area. We believe it would be -- it would not affect the other wells' production or ability to produce. This allowable would just be limited to this one well for the special project stated, and be limited only to this one well.

MR. STOGNER: Do you know if there's any wells that have been produced their gas allowable -- let me rephrase that -- any gas wells in the Angel Peak that are presently producing their allowable that you know of?

A. I don't know of any at this point. The wells that I'm familiar with are producing less than 1.7 million a day.

MR. STOVALL: Let me ask a question in real simple terms that we nonengineers can understand.

It's very clear to me that if you've got one well producing from four standard proration units, that it's reasonable to give them four allowables. You know the allowable for all four units, but if you've got one well that's producing from one proration unit as in this case, what's the rationale for giving it double the allowable?

A. When we looked at this particular half section, it is our belief that we would take it up to two wells to try to develop this in the Gallup/Tocito whether or not that would be part of the rule -- whether or not you could actually drill two wells or not, we thought you'd at least have to have two wells, one in each quarter, to try to develop this, but our examination said that we could not economically drill even one vertical well in there, so that's the rationale behind asking for double the gas allowable for that 320.

MR. STOVALL: You're saying that if you drill two vertical wells you would add the deliverability of those two wells together to determine the allowable; is that what you're telling me?

A. No, sir. I would have to drill two wells to even develop -- to try to develop those reserves.

MR. STOVALL: You're talking about the

engineering sense. I'm talking about the regulatory question. If you drill those two wells to develop those reserves, how would you -- and based on your understanding of the rules that govern this pool, how would you determine the gas well deliverability factor as goes into the allowable calculations?

A. I would probably still have to go with the pool rules of the 1.77 million for the total drill log.

MR. STOVALL: It's all based on oil allowable; isn't it?

A. Yes, sir. It all comes back from the 220 back to the 1776 per day.

MR. STOVALL: I guess I'm still a little confused by why that should be doubled for the gas well, but --

MR. STOGNER: I'm going to go back to an even more basic question to bring me up to date on the Angel Peak. Why was it an associated pool in the first place? What kind of drive mechanism is the Angel Peak Gallup?

A. In this area we believe it is a solution gas-type drive, but I'm not totally familiar with all the history of the Angel Peak field in the Gallup, and I'm not sure -- at one time it was an

oil field, and then I believe in the early to mid 70's it was changed to this associated pool, and I believe people were at -- the reason there was people were wasting gas to develop oil, and whether or not it was associated with the drive mechanism or just to alleviate the waste of oil -- excuse me -- the waste of gas, I'm not sure.

MR. STOGNER: You don't know if it's a gas cap drive or overall in this particular area?

A. It is not overall in certain parts of the Tocito which has primary permeability. It may at one time have had a gas cap.

MR. STOGNER: Do you know how many gas wells are in the pool?

A. No, sir, I do not.

MR. STOGNER: How about in your unit? Are those mostly gas wells or oil wells in your unit?

A. In our unit they are nearly all gas wells. The few oil I know about are to the north of the unit, and there is one to the south, but I do not believe it is classified as an Angel Peak/Gallup well.

MR. STOGNER: Are vertical wells, whether it be gas or oil -- are they stimulated in this area?

A. Yes, sir, they are.

MR. STOGNER: And how are they stimulated?

A. They're stimulated with either sand-water-type fract or sand-water fract assisted by some sort of a gas lift mechanism.

MR. STOGNER: When a vertical well is fractured in this area, do you know the extent of the fracture, or has that been determined out there, or has there been any calculation to determine that?

A. No, sir, not that I'm aware of.

MR. STOGNER: All right. Especially as far as distance goes, if it happens not to penetrate or be near one of these vertical fractures in which you're trying to intercept?

A. No, sir. I don't have that information right now. They're not -- if I may add -- they are not massive fracture jobs that would extend thousands of feet. They are small, localized fract jobs that would stay definitely within the unit.

MR. STOGNER: And that unit -- in the proration unit?

A. The proration unit, the drill block, yes, sir.

MR. STOGNER: But the idea of fracturing is to open up more surface area and also try to establish a communciation with the vertical interval; is that

correct?

A. Yes, sir.

MR. STOGNER: And the way with what you're doing here; is that right?

A. Yes, sir. This well and our first proposal will be completed open hole through the entire Gallup trend if the success warrants it, if not, it would be case-cemented with a liner and fract in our -- in various choice zones as evaluated.

MR. STOVALL: I think you may have gathered at this point we do have a little bit of concern about your gas well allowable request, and the concern, of course, is the correlative rights issue primarily.

In this situation I presume if it's a gas well, there isn't a waste problem of depleting the reservoir energy; is that correct?

A. No, sir. There's no problem there.

MR. KELLAHIN: Let me interject a thought, Mr. Stovall. I think what we were confronted with is the associated gas rules particularly for this portion of this pool within the unit don't seem to fit very well.

Quite frankly, we've got gas wells producing here and we're not in a conventional reservoir where you've got a gas cap and you're

trying to reduce gas withdrawals to maximize liquid recovery, and rather than asking for an exception and treat this as a conventional typical dry gas well, which would not have any allowable constraints on its ability to produce, we felt compelled to deal with the associated rules that controlled the production, but they don't fit very well, and so we're looking at a way to escape the limitations of an artificial gas limit, the associated rules, and maybe we've structured the application wrong, but that's the predicament we're in.

MR. STOVALL: I understand what you're saying, and I think I will tell you from the division standpoint, that we're not opposed to incentives for experimental production techniques that will yield greater reserves, but in doing so an allowable, of course, are the biggest single problem area in that context. One of the ideas which we've kind of discussed is to come up in the context of strict prorated gas pools. It could be applied, I think, consistently in a common ownership area such as a unit in a minute I'll ask you to comment more from a standpoint of -- I think, if this well were authorized to produce at a higher level, and it were, in fact, capable of producing in excess of a

320-acre gas allowable in this pool, can you conceive of any way where that gas could effectively be made up in another part of a participating area?

A. What in effect you're doing is that really is a fancy way of saying "combining allowables," and we're just experimenting with ideas here. I'm not suggesting that as a solution. Again, you know, I know Mr. Alexander knows more than just land, if he'd like to get into this too.

MR. STOVALL: Let's let the engineer answer it from an engineer standpoint, then from a practical standpoint. Mr. Alexander I'd be glad to have your standpoint on that. We're just trying to get some ideas that can be used as a precedential value uniform application to comparable situations. I guess that's what I'm trying to say.

A. Let me see if I understand. You're saying if we were, in fact, able to produce this well in excess of the gas allowable, would it limit any other wells?

MR. STOVALL: Could you conceive of a way that you could use some other well's allowable, in effect, to do that?

A. Not the way it's set up right now because of the drill blocks.

MR. STOVALL: On a proration unit basis; is that what you're saying?

A. To my knowledge they are, yes, sir.

MR. STOVALL: And just for your information, sir, so you don't think I'm completely coming out of the blue on this, we've had requests for special allowables in the gas pools in the northwest and have talked about unit-type of lease allowables rather than proration unit allowables -- ideas that are being -- that's where the idea comes from.

A. If this well were what we would term a success, and would, in fact, be able to produce in excess of the unit gas allowable, we would -- we would probably research the effort and come back with some sort of a system to develop these marshland areas probably. Some sort of -- at this point, we don't have enough background as to how these wells will perform and do not want to open up the can of worms of, "Do we need to develop a different allowable system for the different marshland areas of the system of Gallup?"

MR. STOVALL: Yeah, I understand. Now the other thing is unlike a prorated gas pool, you don't have an overproduction limit as such which would allow you to produce like gangbusters for a while to

test the well; is that correct?

A. To my understanding it is strictly a daily allowable and we wouldn't be able to exceed that on an excessive basis.

MR. KELLAHIN: We only have a three-month swing under these rules for gas allowable overproduction if you will.

MR. STOVALL: Again, and we're throwing something out that I know you haven't had a chance to discuss with management, but from your professional opinion as an engineer, from looking at it from a testing and not an economic recovery standpoint, would you have any -- what would your opinion be of a -- given a deliverability-based allowable on a period of time to allow you to test the well, but tracking that against standard allowable and then requiring makeup over a period of time and putting in some special testing-type allowable with a makeup situation to get back into balance, so to speak, from an engineering standpoint is what I'm asking.

A. We would like up to a year to evaluate the well once it comes on production. Whether or not you want to set up a testing period of that length of time, I don't know, but a year's worth of

production would be most helpful in our evaluation.

MR. STOVALL: Do you you have any idea in your mind what the potential sustained deliverability of this well could be? Have you got any basis for making that kind of opinion?

A. Not at this time. There are wells in that area that would have produced at first in excess of that in some of the fracts -- what we believe to be the wells incurrent fractures in the Niobrarra

MR. STOVALL: In excess of 17 million -- excuse me -- 1.7 million?

A. Yes, sir, but at this time, they are of an age where they would not do that at this point. They have a very large cumulative production and they are not depleted, but they have depleted at some of their drive, and they would not produce at this time.

MR. STOVALL: Do you have an opinion as to whether or not this well would sustain above 1.7 million rate for a year, or is it likely that you might produce double your,, say three million or whatever and come back down so it would almost bring itself into balance through depletion of the --

A. Probably in a length of time it would bring itself into balance, yes; an evaluation would be

important to us in productivity of the sands and whether or not we were within the right area to test this technology.

MR. STOVALL: Again, I'll point out to you for everybody, to help you structure your thinking, what we are trying to do -- the division has not yet written any general specific rules for horizonal drilling. The reason we've not done so is there are different situations, and we're trying to gather information when we write rules which make these things more automatic and we can handle administratively. We'd like to know what we're doing, and that's why I'm asking how we can develop your testing. Meridian happens to be one of the more active horizontal drillers at the moment I guess.

A. Well, sir, let me say this: Meridian has brought before you a horizontal well in the Cole. We brought before you horizontal high angle wells in the Mesa Verde, and now we're coming at you for the Gallup test, and from that standpoint it would -- you would be hard-pressed to try to develop some overall rules. You would still have to stay within some sort of pool outline, so we want to stress that this is a Gallup test and for that reason we're not

trying to stay within any other preestablished rules for the horizontal well because they just do not apply.

MR. STOVALL: I understand that, and I guess what I'm saying is that if we develop this -- what we do here is hopefully we can generate some information so that we can be consistent in similar situations.

A. Yes, sir.

MR. STOVALL: And we're trying to approach it from a creative standpoint, if you will. I don't think I have any more questions about the technical aspect of that. I hope you understand what the purpose of this questioning is, and what we're trying to do here is balance correlative rights and still give the incentive to do more efficient production methods if possible, and how best to do that is more the -- I have no further questions -- engineering-type questions. Do you, Mr.Stogner?

MR. STOGNER: Not at this point. Mr. Kellahin you may want to ask more of these questions with your other witnesses when they come up concerning this particular issue, especially Mr. Alan Alexander. I understand, as Mr. Stovall suggested, knows a little bit more about this.

MR. KELLAHIN: Let me go ahead and present the rest of the witnesses so you can get a complete picture of the different parts and we can go back into my witnesses if you want to.

MR. STOGNER: Mr. Kellahin, getting some telepathic communication from Mr. Carr to please watch your language. We will not allow profanity in my hearing process.

MR. KELLAHIN: What I say here I've learned from Mr. Carr.

MR. STOGNER: Thank you, Mr. Jones. You may be excused at this point.

EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Dawson, for the record, will you please state your name and occupation?

A. Michael K. Dawson, a geologist for Meridian Oil in Farmington, New Mexico.

Q. Mr. Dawson, have you previously testified before the division as a petroleum geologist?

A. No, I have not.

Q. Summarize your educational experience and your employment for us.

A. I received a bachelor's degree in geology from the University of Michigan in 1971, and a

master's degree in geology from San Diego State University in 1978. From 1978 to 1980 I worked for Conoco, Inc.; from 1980 to the present I work for El Paso Exploration, now Meridian Oil. That period of time includes several years of experience in the San Juan Basin.

Q. What has been your specific involvement as a petroleum geologist concerning the Huerfano Unit and specifically this high angle/horizontal well project?

A. I did the initial geologic study that identified the Huerfano Unit as prospective for an application of high-angle drilling technology to the Gallup integrals.

Q. Mr. Jones has given us some of the reservoir information that caused Meridian to request this type of case. Let me have you give us the geologic background, and it might be helpful if I can have you turn to some of the geologic displays. Perhaps it's easiest to start with Exhibit Number 5 and let's look at a typelog. Where is this well from which the typelog was taken?

A. This is the Huerfano 287 just about a half mile to the southeast of the 300. This well specifically is also used as one of our reference

wells on our large display on the wall. It's the righthand well, and on our plat showing the well track, you can see that it's just about that half mile I mentioned to the southeast.

Q. Give us a summary of the reservoir geologic description that we're seeing in the Niobrarra and the Tocito Gallup.

A. We we are identifying the upper part of the Gallup or upper interval of interest which includes, if you'll refer to your typelog, Niobrarra A, B and C. We're looking at that as an interval consisting of interbedded sandstone, shales, and silt stones with very low matrix permeability.

We feel that it is prospective for natural fracturing and we would expect that fracturing to be vertical in nature, and most of the fracturing to be bed specific and limited to individual sandstone or silt stone stringers, those being the more brittle beds.

That interval -- that Niobrarra as we refer to it informally, we consider our primary objective in this well in the Angel Peak Field. That interval is completed in about half the wells, but we have reason to believe that it's not a major contributor in that field for a couple of reasons, including

some tests; for instance, in this 287 where we individually tested the upper purse versus the Tocito. Also we feel that from a few key wells in that area of the Basin that it is productive from natural fractures what we have density logs that show as little as one or two percent porosity yet we have some pretty decent production, so that upper interval is our main objective in this well.

Secondary objective is to test the Tocito sandstone which is sandstone with fairly good intergranule permeability, especially towards the axial part of its trend, and we want to test that out at the edge. There's kind of an apron of sand that extends out beyond the axial portion of the barlike trend. The tertiary objective would be the true agressive Gallup sandstone. If you look at your typelog it would be the sandstone about 25 feet thick just below the unconformity symbol.

So we have three different reservoirs that we're testing here in this particular well.

Q. Let's talk about the distribution of the reservoir within this particular area. If I can get you to turn to the displays after Exhibit 7, what's the first one that you've got in the book?

A. This is the Tocito sandstone. It's a net

sandstone isopach where I've put it with sandstone with greater than 9 percent porosity. It shows that we are at the southwest edge of the trend that I mentioned. In other words, the sandstone's thicker to the northeast, and if you look at the well tracts -- that's the dashed line there -- you can see what we expect, given our well plan, to intercept the Tocito sandstone, and at that point we expect something like six feet of net thickness.

Q. When you get into a better portion of the reservoir in terms of thickness, is there a relationship between thickness and productivity of the wells?

A. In general there is. There are some because this area is prone to natural fractures and there's kind of on over prane of permeability upon the stratigraphy. It's not a one-to-one relationship. It's not -- every well production is proportional to its net thickness. That doesn't occur, but in general you could say that the wells are thicker -- the Tocito sandstone in the field are the more productive wells.

Q. From a geologic perspective can Meridian be successful with vertical wells drilled to develop these reserves in section 31?

A. In the east half looking at specifically the Tocito and particularly the northeast quarter, I think there's probably a fair chance of encountering commercial production in the Tocito, and in the southeast quarter where our surface location is, the risk of encountering commercial permeability in that Tocito sandstone is rather high, and we probably would not drill that. In the southwest quarter where we expect -- in this well bore -- to encounter the sandstone, it's far too risky. We would not ever drill that vertically because of economic modeling.

Q. In this particular area when you make a cross section or a display in intergrating logs from well to well, what is your conclusions about the continuity of these various members of the Gallup as we look at those in close proximity to each other?

A. They are fairly continuous in gross aspect. In other words, very easy for me -- as I've done on the wall here -- to correlate the Niobrarra A to the Niobrarra A a mile or two away, and, in fact, I can find that same unit 30 miles away in general. The correlations are pretty good, but looking at these units on a smaller scale, on a reservoir scale, if you will, there are numerous

discontinuities.

Even if the Tocito sandstone, which we think of basically as a clean course moving grain bar, there will be mud dregs through that that will separate the sandstone into the reservoir compartments et cetera.. In the upper part, in the Niobrarra, it's highly bioturbated or worked upon by little critters that lived on the cretaceous seafloor soon after the deposition. There are all sorts of permeability barriers. So on a small scale and on the reservoir scale, these rocks are rather discontinuous, but on the large gross scale they are very continuous.

Q. Let's turn to the structure map that's shown behind the isopach. Give us a quick summary of the conclusions of the structure.

A. The structure map indicates basically homoclinal or flatdip rate in the area that we'll be drilling. In fact, the dip rate is about one degree to the northeast east.

In our vertical section here we've actually accounted for dip and you can see just a various tiny dip rate if you follow one of the limebed outlines from right to left. You'll see that it's a very small dip. We can infer from that that and

infer from the structure map, that our natural fracturing is not related to tectonic elements such as faulting, or folding, that the natural fractures that we're looking for would be more of a regional-type of fracture that fracturing upholds throughout this whole area, not necessarily related to a single tectonic element.

Q. In mapping the geology can you specifically define a gas/oil contact in this immediate area of the Gallup?

A. No. I don't believe any such contacts would exist. The gas/oil ratio, or, to invert that to yield in this area, when we look at production, are fairly similar throughout the Angel Peak pool in particular. There's no indication that there is such a contact.

Q. Do you see any indication geologically that there is a gas cap or the potential that a gas cap could form if the division approves the withdrawal rates that Meridian requests for this project well?

A. I believe that that would not occur.

Q. When we look at the core samples for wells in this particular area, have you examined those cores?

A. Yes, I have. We have one core. It was cut

by El Paso Natural Gas in 1974. That's a weapon 255 which is almost exactly six miles east of the 300.

Q. Have you brought an example of the core with you today?

A. Yes, sir, I have.

Q. The hearing examiner has that before him, and as he looks at that, would you give us a description of what that is that you find significant as a geologist in that core sample?

A. Yes, I'd be happy to. The core on the examiner's right is, I think, a good example of the Niobrarra interval that we hope to find productive in our well. You can see -- although I said that these large units are correlative over long distances, you can see that the sands within this core are fairly discontinuous. They've been reworked or bioturbated. There's fair amounts of shale debris in there that has contributed to calcium carbonate and lead to intense cementation of the sandstones and siltstones, and in that core the sandstones and siltstones will be your lighter gray bed. The interbedded very dark shale, nearly black, has a high total organic content and serves as an excellent source bed in this area.

So you have these very tight sandstones

with low matrix permeability and porosity, yet there is enough there so that they can act as little local reservoirs, but in order to find any commercial production in that kind of rock, you pretty much have to have natural fracturing. The contrast --

Q. What's the second example?

A. The second example is from the Tocito sandstone itself. The examiner could probably notice that it's a fairly coarse to medium-grain sandstone with some indication of porosity in there. That has an average porosity of about nine percent, yet it would have very low permeability. In fact, this well, the 255, has cumed only about 60, 70 million feet of gas since it went on production.

So although that sandstone looks fairly good in the hand specimen and the core, we're confident that it has very low permeability and could be related to -- and, again, this well is, I think, analygous to our situation in the 300 because it's an edge well on the bar trend. It's at the north edge, and because of cementation, perhaps mud drapes, and I didn't bring an example of that, just above this interval there's a two-inch shale that obviously drapes through the, or drapes through the bar and creates a reservoir compartment. Those

things have contributed to low permeability and low production from that sand.

Q. Describe to us, geologically, what advantages you see in the development of this portion of the unit with a horizontal well that you can't achieve with a vertical well.

A. Well, as I've mentioned earlier, in this area, nearly all the wells have been mud drilled through the Niobrarra and about half in the pool itself were completed in that upper Niobrarra interval. We have reason to believe that because of the small aperture of the natural fractures and the clay content of these sandstones, although the mixing by bioturbation, that mud drilling severely damages both the matrix permeability and the permeability in these rocks.

What we're attempting to do is to -- by drilling at a high angle and maximize the number of fractures that we encounter and also minimize the amount of damage we incur by not using the mud system on it.

MR. KELLAHIN: That concludes my examination of Mr. Dawson. We will mark, Mr. Examiner, the large display to which he's referred to as Exhibit Number 8. You're welcome to keep the core samples

here. We can mark them as subsequent exhibits. We'd like to have references to them. They can be 9 and 10, if you will.

MR. STOGNER: Let's do not make these exhibits, but we'll take --

MR. STOVALL: They're real tough to microfiche.

MR. KELLAHIN: We'll simply take them back with us if you want, or you may keep them here for reference.

MR. STOGNER: Let's keep them here for reference for the time being, and sometime after the well is drilled, or sometime down the line, if you remind me, I'll give them back to you.

MR. DAWSON: They can be used as paperweights, by the way.

MR. STOGNER: We've got plenty of paperweights.

MR. KELLAHIN: Let me ask you if at this time, Mr. Examiner, that we move the introduction of Exhibits 5, 6, 7 and 8 if we have not already done so.

MR. STOGNER: Exhibits 5, 6, 7 and 8 will be admitted into evidence at this time.

As being a member of this unit that you're

working with, the whole interval which you show as on A, B, C -- A, B, and C the Tocitio sandstone and the Gallup sandstone, are all intervals of interest to this particular well; is that correct?

A. Yes, sir.

MR. STOGNER: And they will all be penetrated?

A. As planned, yes, sir.

MR. STOGNER: And perforated, I assume, rather if this is a preperforated interval or some casing that will be perforated later?

A. Yes, sir. In fact, if I may point out, on our reference well, the Huerfano 287 on the right, I've denoted in red where the perforations in that nearby well lie, and all three of the major rock types, Niobrarra, Tocito and the lowest, the Gallup sandstone, are productive in that well. We believe that most of the reserves will come from the Tocito in that well.

MR. STOGNER: Were all these perforations done at the same time in the number 287?

A. No, sir, they were done in two stages. The Tocito and underlying Gallup in one stage -- then it was tested -- then the Niobrarra B in the second stage.

MR. STOGNER: When you say "two stages," are

we talking about a year separation or just the testing?

A. No. Within a few weeks.

MR. STOGNER: But they're all producing at this time, the B and the Tocito and the Gallup?

A. Yes, sir.

MR. STOGNER: Now you show some other small boxes. Are those perforations also?

A. No, sir. Those are gas shows from our mud logging unit. They indicate perhaps the productivity in the intervals of interest within the Niobrarra in particular.

MR. STOGNER: Are there any other questions of Mr. Dawson? Before we go on any further, Mr. Kellahin, how much longer do you think this case will take.

MR. KELLAHIN: About ten or fifteen more minutes.

MR. STOGNER: Okay. And Mr. Jim Bruce, are you here for Burnett?

(Discussion off the record.)

MR. STOGNER: I believe we were through with Mr. Dawson. Mr. Kellahin?

MR. KELLAHIN: I'd like to call Mr. Paul Allan.

EXAMINATION

BY MR. KELLAHIN:

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

A. Paul Allan. I'm a drilling engineer with Meridian Oil in Farmington, New Mexico.

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

A. No, I have not.

Q. Summarize for us your particular involvement with this project for drilling the high-angle well in the Huerfano unit.

A. I was the drilling engineer on this project. I developed the operation plans and assisted with the geologist and reservoir engineer.

Q. Have you obtained an engineering degree from some institution?

A. I obtained a degree bachelor of science degree in mechanical engineering at Texas A&M University.

Q. In what year?

A. In 1990. And since that time I've worked at Meridian Oil in Farmington, New Mexico.

MR. KELLAHIN: We tender Mr. Allan as an expert drilling engineer.

MR. STOGNER: Mr. Allan is so qualified.

Q. (By Mr. Kellahin) let me take you quickly to the display shown behind Exhibit number 4, which is the vertical section of the well. Do you have that before you Mr. Allan?

A. Yes, I do.

Q. Give us a summary of the drilling and completion program that you've recommeded for your company and what you propose the examiner adopt for utilization for this well.

A. Okay. We will be drilling out 17 and a half inches surface hole, setting 13 and 3/8 casing at 300 feet, drilling with mud to a kickoff point at 4838 using a motor assembly, a bent sub motor assembly, at this point, and building 12.5 degrees for 100 angle to 84 degrees. At this point we will run 9 and 5/8 inch casing, and set that at a measured depth of 5510 and a true vertical depth of 5294. We will drill out at this point with a dtu motor assembly with an 8 and 3/4-inch bit to a total depth.

I will be using a radiotelemetry measurement while drilling system throughout this interval.

Q. How will you complete the well for

production?

A. Using a five and a half perked and plugged liner preperforated drilled out, and then plugged with aluminum plugs. We'll go back in with a metal assembly and break off these plugs and open up the perforation.

Q. And do you propose to treat or stimulate the well in any fashion after you've got it ready for production?

A. No, we do not.

Q. Mr. Boone has summarized for us Meridian's drilling for the Howell the the Riddle well, which he supervised, and described his plan of operation for the Sunray well. In a summary fashion, contrast for us what are the major differences, if any, between the program Mr. Stogner has just heard Mr. Boone describe and what you prepare to do in your well.

A. I am setting casing all the way through the bend. That's a major difference, I guess, and other than that there are few differences really.

Q. Mr. Boone described his change in procedure with regards to drilling the angle or the curve with mud, and then replacing that with this mist drilling procedure. What do you plan to do?

A. We will be drilling with drill gas through the entire interval. It's a fairly dry section and we don't foresee any problems with hole cleaning with the gas at that point.

This will minimize the formation damage and it is a new technology, but it will help us out quite a bit.

MR. KELLAHIN: That concludes my examination of Mr. Allan. Pass the witness.

MR. STOGNER: After you get through with the curve portion with your gas application, then you set a DTU? I'm sorry.

A. It's a doubled tilted U-joint. I've got a copy of it right here.

MR. STOGNER: Okay.

A. It's a double bend on the motor. It can be rotated and it will drill a straight hole or it can be slid and the actual motor drill, and it maintains an angle. You can build angle with that case in any direction. It's a steerable system. As soon as you get to the inclination you would like, and the azimuth you like, you can begin rotating and it will hold a straight hole at that point.

MR. STOGNER: Now will you be drilling the 84 -- or the horizontal portion with air or mist or

mud?

A. With drill gas.

MR. STOGNER: With drill gas.

A. Yes, sir.

MR. STOGNER: What is drill gas. Explain what drill gas is.

A. It's methane gas, natural gas.

MR. STOGNER: Least used gas. And what size of production casing are you going to be setting?

A. It will be a 5-and-a-half-inch liner from approximately 5510 feet measured depth, 2TD.

MR. STOGNER: And will that be a preperforated?

A. Yes, it will.

MR. STOGNER: Any stimulation?

A. No.

MR. STOGNER: The motor in which you will be using natural motor, and I call it mud motor, will it be a regular mud motor or a pneumatic-type of motor, or one that's somewhat changed?

A. Through the build section, the 12.5 degree per 100 build section, we will be running a mud motor. At that point when we switch over to drill gas, we will be running an air motor that is especially adapted to that. It has a new bearing

design and was mentioned earlier the load configuration is different to allow for the increased flow rate of gas.

MR. STOGNER: I'll make this part of Exhibit number 4. Mr. Kellahin, you've got two pages of Exhibit 4; right?

MR. KELLAHIN: Yes, sir.

MR. STOGNER: Why don't we make this more subsequent.

MR. ALLAN: Those are vendor-related We may end up going with another vendor, but the motor configuration will be similar.

MR. STOGNER: Okay. I'll take note of that. Are there any other questions of this witness?

MR. STOVALL: Yeah. Does the use of methane gas as a drilling medium present any particular danger?

A. That's the reason it's used instead of air, in fact.

MR. STOVALL: Is that why it keeps your gas concentration up high enough --

A. Right. There's no oxygen level to sustain conbustion. That's why we're using that instead of air.

MR. STOVALL: What about is it -- I assume it

circulates in a similar manner to other mediums with the surface if you're cutting --

A. Yes.

MR. STOVALL: Any problem when it comes? Is it still closed do you don't have a -- so you don't get air?

A. Well, we will flare off the gas and use a muffler system as well to maintain the flare and that sort of thing. The standards of the Fruitland Coal project was the same type of situation.

MR. STOGNER: No other questions of Mr. Allan, Mr. Kellahin?

MR. KELLAHIN: I'd like to call Mr. Alan Alexander in to expedite his presentation. May the record reflect that Mr. Alexander has already qualified as an expert in the prior case, and continues as such in this case.

MR. STOGNER: Thank you, Mr. Kellahin. The record will so show.

FURTHER EXAMINATION

BY MR. KELLAHIN:

Q. Mr. Alexander, let's talk specifically about the correlative rights concerns with regards to the spacing unit proposed for the high-angle well, how that may or may not affect the interest

owners of those spacing units within the unit that adjoins the subject spacing unit. First of all, when we look at Exhibit number 6 and fold out a display of the unit, what type of unit are we dealing with?

A. Now this is a Federal Unit, and it's characterized as a geologic inference-type unit as opposed to some of the other units that we operate that are drill block units, and the difference being that in the drill block units normally you expand your participating areas by simply including the acreage assigned to that drilling block, and this unit, the geologic inference unit, we have the flexibility to include acreage other than just the drill block in the participating area if that should become necessary, and that's a function of what the well is capable of draining.

Q. How will the correlative rights of those owners with interest that adjoin the spacing unit be protected by the expansion or contraction of these participating areas?

A. Well, first of all, the drill block itself -- if the well is commercial -- will come into the existing participating area and will expand it, and that serves to equalize participation in that

product throughout the participating area.

Q. Who makes the final decision on approving the expansion of the participating areas? Is that an operator decision, or is that decided by others?

A. Yes, sir. The operator makes the determination initially as to whether or not the well is capable of commercial production, and then that is agreed upon or recognized by the regulatory agencies, and then it officially becomes a part of the participating area after the regulatory agencies approve the expansion.

Q. All right. What regulatory agencies are involved in approving the expansion of these participating areas?

A. It would be the Bureau of Land Management, the Commissioner of Public Lands, and NMOCD.

Q. Are there any other working interest owners besides Meridian involved in the ownership of the spacing units surrounding the proposed spacing unit in 31?

A. Yes, sir. There are other owners in those spacing units besides Meridian.

Q. Are there noticed procedures in the unit agreement to notify those parties of the expansion or contraction of participating areas so they may be

involved in participating in those decisions?

A. Yes, sir. That process starts actually when we file a plan of development within the units. We list this well and the type of well that it will be, and all the unit owners comment or approve that drilling program. So actually they have already approved this well to be drilled.

We have filed a plan of development listing this well with the regulatory agencies. I don't know as of this date whether that particular plan has been approved, but I anticipate no problems.

Then, as we drill the well and the well is deemed commercial, we will begin the work to expand the participating area. Again, the unit owners are notified of that process and have the opportunity for input in that process.

Q. Within the framework of this unit participation procedure, do you see the opportunity for the impairment or violation of correlative rights if the division examiner approves the level of allowables, for this project that the engineers have requested?

A. No, sir. Not within the confines of the unit itself. That is really a contractual relationship between the unit owners, and the issue

of correlative rights -- and they have the full ability to have input into that -- and through the participating area arrangement, they do participate at one level or another either now or in the future.

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

MR. STOVALL: Mr. Alexander, you heard when I was talking to Mr. Jones about doing something other than sort of this artificial two times formula which is simply based upon, you know, the mathematical formula for calculating the allowable in this associated pool, for example, doing like a deliverability allowable for a year with a potential of make up. From an administrative, landman -- whatever point of view -- what's your opinion on that?

A. Well, I don't perceive production from this well to be a problem of correlative rights particularly within the unit, and if I understand our reservoir and the rest of the technical teams' viewpoint, we don't expect this -- any drainage from this well to extend beyond the drill block, certainly not outside of the unit.

So when you look at it from that aspect it

becomes a matter of the distribution of that product, or how that product impacts the unit owners. In a sense, we have a unit agreement that handles that situation. In the overall context, I don't believe that we have a problem in that area.

MR. STOVALL: Didn't I understand you to say that after you get this well on production and find out what it's capable of, you go back and -- reading a lot into what you said, and tell me if I'm wrong -- but you go back and evaluate the well and see how it performs, try to make some calculations, and if you determine that it was draining more than its proration unit, then you could, in fact, bring more than this 320 acres into the participating area? Is that under the contractual arrangement that you were talking about?

A. Yes, sir. Since we do have the ability to have a geologic inference determination here, that can be done.

MR. STOVALL: I don't think I have any further questions.

MR. STOGNER: I have no other questions of Mr. Alexander. Do you have any other questions, Mr. Kellahin?

MR. KELLAHIN: I have no further questions,

Mr. Examiner.

MR. STOVALL: I do have a question for -- just one further question for Mr. Jones.

MR. STOGNER: Can we recall Mr. Jones at this time?

MR. STOVALL: It's a fairly easy one, Mr. Jones. In some situations, I know, with horizontal drilling, one of the advantages is that you can get more productivity without less pressure drawdown; is that correct? When you're spreading it over a wider area?

A. Yes, sir, that is true in some cases.

MR. STOVALL: Would that be applicable in this case, do you think?

A. Yes, sir. I think at this time I can say that until we actually drill the -- we actually drill the well and see what kind of formations and pockets of productivity we do encounter, -- we're not sure, but at this time I'd say that, yes, sir.

MR. STOVALL: Here I go venturing into engineering areas as I try to avoid doing, but every now and then I've got to do it. If you -- where I'm going with it is, if your pressure drawdown is reduced to a point and you're getting the volume through less pressure reduction because you've got

more areas of the reservoir exposed to the pipe, it would lead me to believe that would mean that your drainage distance from the -- laterally away from the wellbore would tend not to be as great. Is that a fair evaluation? Is that a reasonable statement? In other words, the impact on correlative rights really is where I'm going.

A. Pressure drawdown could -- I'm not sure I understand your question.

MR. STOVALL: In other words, if you're producing at a higher rate from this well --

A. Yes, sir.

MR. STOVALL: If you were a vertical well and you're producing at a higher rate and from what little engineering I understand, that would mean that given the same thickness you would be drawing from a wider area. You would be getting more gas from a bigger area and your pressure would be creating a low-pressure center for gas to migrate to all the other factors considered.

A. Yes, sir.

MR. STOVALL: If you're producing at the same higher volume from this well, you're producing from a larger area, but it's only because the well is in contact with a larger area and it's not necessarily

drawing from a bigger radius away from the wellbore?

A. Not initially, but eventually we would -- we would say that, yes, it would have to start drawing from a larger area, but initially, no, it would probably be due to the larger contact area.

MR. STOVALL: That's enough engineering for me. I have no further questions.

MR. STOGNER: No other questions of Mr. Jones?

MR. KELLAHIN: I have a followup, Mr. Examiner.

Q. (By Mr. Kellahin) Let me make sure I have a clear understanding of the permeability and therefore the transmissibility of fluids in this reservoir. What is the range of permeability you as a reservoir engineer see in this specific area, can you recall?

A. Not exact numbers. I can just say in relative terms that the Niobrarra is very tight, as Mr. Dawson illustrated with his samples, and in the Tocito, in the thicker areas, permeabilities are in the range of a milidarcy. They're not microdarcies. They're in the range of a millidarcy and permeability.

Q. With the reservoir that is linticular as Mr. Dawson described with these low permeabilities,

do you have a concern as a reservoir engineer that if the division approves your allowable requests, that you're going to have substantial migrations or transmissibilities of these fluids over large areas?

A. No, sir. It will not be large areas, it would be definitely within the drill block.

Q. Okay. Do you see any problems in wasting gas drive energy by producing it at the gas allowables you've requested?

A. No, sir. I don't think we'll be wasting any drivability of the reservoir itself.

Q. You've characterized these linticular reservoir zones as being solution gas drive reservoirs. Did I hear that, or did I misunderstand you?

A. That would be the characterization I've given.

Q. All right. And if that's true, then they're not going to be rate sensitive, are they?

A. They shouldn't be, no, sir.

Q. So regardless at the rate you pull the gas out, you're still going to get the same volume of oil out of that pod or out of those lenses, aren't you?

A. It should be the same.

Q. All right. Final question then on the cost comparisons. When we look at the vertical well, we're looking at the range of half a million to $600,000?

A. Yes, sir. That's current-day process.

Q. And when we look at the projected horizontal well, we're sometimes three and four times that amount?

A. Yes, sir.

Q. So in addition to having the flexibility to test this well at levels that you want, you also need some incentive in order to go ahead with the project economically?

A. That would provide economic incentive, yes, sir.

MR. KELLAHIN: No further questions.

MR. STOGNER: Thank you. Any other questions of Mr. Jones? If not, he may be excused. Anything further in case number 10325?

MR. CARR: Mr. Examiner, Amoco would like to make a brief statement through Mr. Hawkins.

MR. STOGNER: Okay.

MR. HAWKINS: I'm Bill Hawkins with Amoco Production Company. Amoco has an interest in this unit, and, in fact, in this drill block.

We believe that Meridian should be allowed to drill this well to test its technology in the Gallup. We believe because of the unit considerations there will be protection for correlative rights of all the owners in this area. We also believe that Meridian needs the opportunity to produce this well and determine what its productive capability is and what its ability to maintain that production rate will be, and what kind of improvement that might be over a vertical well.

Even if that's for a minimum of six months to a year, I think they should be allowed at least to get that kind of information to help them in their advancement of technology in this area, so we are in support of their project and have no objections to their application.

MR. STOGNER: Thank you, Mr. Hawkins. Anything further in this case? If not, case number 10325 will be taken under advisement.

(The foregoing case was concluded at the approximate hour of 11:55 a.m.)

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10325, heard by me on 13 June 1991.

Michael E. Stogner, Examiner
Oil Conservation Division

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

REPORTER'S CERTIFICATE

BE IT KNOWN that the foregoing transcript of the proceedings were taken by me, that I was then and there a Certified Shorthand Reporter and Notary Public in and for the County of Bernalillo, State of New Mexico, and by virtue thereof, authorized to administer an oath; that the witness before testifying was duly sworn to testify to the whole truth and nothing but the truth; that the questions propounded by counsel and the answers of the witness thereto were taken down by me, and that the foregoing pages of typewritten matter contain a true and accurate transcript as requested by counsel of the proceedings and testimony had and adduced upon the taking of said deposition, all to the best of my skill and ability.

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

DATED at Bernalillo, New Mexico, this day July 29, 1991.

My commission expires
April 24, 1994

LINDA BUMKENS
CCR No. 3008
Notary Public