STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

CASE 10,663

EXAMINER HEARING

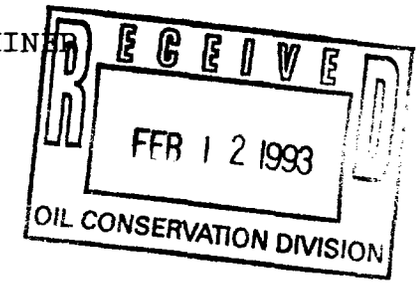
IN THE MATTER OF:

Application of Union Oil Company of California d/b/a Unocal for an administrative downhole commingling procedure within the Rincon Unit Area, Rio Arriba County, New Mexico

ORIGINAL

TRANSCRIPT OF PROCEEDINGS

BEFORE: DAVID R. CATANACH, EXAMINER



STATE LAND OFFICE BUILDING

SANTA FE, NEW MEXICO

February 4, 1993

A P P E A R A N C E S

FOR THE DIVISION:

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I N D E X

I N D E X (Continued)

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E X H I B I T S

APPLICANT'S EXHIBITS:

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WHEREUPON, the following proceedings were had at 8:23 a.m.:

EXAMINER CATANACH: At this time we'll call Case 10,663.

MR. STOVALL: Application of Union Oil Company of California d/b/a Unocal for an administrative downhole commingling procedure within the Rincon Unit Area, Rio Arriba County, New Mexico.

EXAMINER CATANACH: Are there appearances in this case?

MR. CARR: May it please the Examiner, my name is William F. Carr with the Santa Fe law firm Campbell, Carr, Berge & Sheridan.

We represent Union Oil Company of California, and I have three witnesses.

EXAMINER CATANACH: Any other appearances?

Will the three witness please stand to be sworn in?

(Thereupon, the witnesses were sworn.)

DAVID E. JOHNSON,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CARR:

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

A. David E. Johnson.

Q. And where do you reside?

A. Houston, Texas.

Q. By whom are you employed?

A. Union Oil Company of California.

Q. And in what capacity?

A. I'm a petroleum landman.

Q. Mr. Johnson, have you previously testified before this Division?

A. No, I have not.

Q. Would you briefly summarize your educational background and then review your work experience for Mr. Catanach?

A. I have an associate's degree in real estate from Waukesha Technical Institute, I have worked for the Union Oil Company of California for the past 26 years, the last 13 years as a petroleum landman in the oil and gas division.

Q. Does the geographic area of your responsibility for Unocal include northwest New Mexico?

A. Yes, it does.

Q. Are you familiar with the status of the lands within the Rincon unit?

A. Yes, I am.

Q. And are you familiar with the Application filed in this case on behalf of Unocal?

A. Yes, I am.

MR. CARR: Mr. Catanach, at this time we tender David Johnson as an expert witness in petroleum land matters.

EXAMINER CATANACH: Mr. Johnson is so qualified.

Q. (By Mr. Carr) Would you briefly state what Unocal seeks with this Application?

A. Union is seeking an administrative procedure for downhole commingling of the Blanco-Mesa Verde or the Largo-Gallup formations with the Basin-Dakota formation in the Rincon unit.

Q. Could you briefly review for the Examiner the events which have resulted in today's hearing?

A. In the past 12 months, Union has filed five applications, individual applications for downhole commingling.

Three of those have been approved, and after approval of the third a telephone conversation between Mr. Catanach and our district engineer in Farmington was held in which Mr. Catanach requested that Unocal appear and ask for an administrative approval or method

that this commingling could be accomplished.

Q. And in that conversation it was discussed that we would present testimony on two questions, correct?

A. Correct.

Q. One of those was the status of the ownership -- related to the status of the ownership in the Rincon unit?

A. Correct.

Q. And you will testify as to that?

A. Correct.

Q. And the following that, there will be technical witnesses who will discuss the unit and the economic need for a downhole commingling program in that unit?

A. Yes.

Q. How many wells would actually -- or could actually be affected by this Application?

A. Approximately 75 wells, which include 33 that have not been drilled.

Q. Let's refer to the exhibit book, and I would direct your attention to the tab marked Exhibit 1. Could you just identify what is behind that tab?

A. That is a copy of the Application.

Q. And let's go, then, on to Exhibit Number 2.

What is that?

A. Exhibit Number 2 is a general location map showing the Rincon unit and its relationship to Northwestern New Mexico and the southern part of Colorado.

Q. If we would move on, then, to Exhibit Number 3, would you identify that and then review the information on this exhibit for Mr. Catanach?

A. Exhibit 3 is an outline of the Rincon unit and the lands so located inside the unit. The colored lines represent the three participating areas, the Blanco-Dakota, the Mesa Verde and the Largo, in the respective colors.

Q. This unit is operated by Unocal?

A. Unocal is the operator.

Q. And when did Unocal assume operations?

A. In 1986.

Q. What are the numbers reflected on this Exhibit?

A. The numbers on the exhibit are the tract numbers which relate to the individual leases.

Q. And are these the same numbers that are used in the Rincon unit agreement?

A. Yes, they are.

Q. Would you identify what is behind Tab 4 in

this exhibit book?

A. Tab 4 is a copy of the Rincon unit agreement.

Q. Mr. Johnson, what kind of a unit do we have here?

A. The Rincon unit is a federal, divided-type unit which requires participating areas be established for production and payment of royalties and overriding royalties.

Q. So royalties and overrides are based upon the participating areas?

A. Based upon the participating area and the relationship of the tracts to the participating areas.

Q. What formations are actually unitized by this unit agreement?

A. All the formations are unitized.

Q. And when was the unit originally formed?

A. 1951.

Q. Now, how is the working interest paid in this unit area?

A. Under the unit operating agreement, the working interest is pooled or fixed over the entire unit. All the working interest is entirely fixed throughout the unit, and it does not pertain to the participating areas whatsoever.

Q. So it's identical in all formations from

which there is production?

A. Identical from all formations, yes.

Q. Could you identify what is marked as Exhibit Number 5?

A. Exhibit Number 5 is a list of the working interest owners in the Rincon unit.

Q. Now, working interest payments are on a unit basis?

A. Working interest payments are on a unit basis.

Q. How is the royalty paid in the unit area?

A. Royalty is paid on a tract basis.

Q. And would the royalty paid to the individual royalty owners vary depending on the size of the participating areas?

A. It would depend on the size of the participating area.

Q. And is this in fact how royalty is and has been paid to the royalty owners?

A. Yes, it is.

Q. And that is pursuant to the unit agreement?

A. That's pursuant to the unit agreement, yes.

Q. Is this a voluntary unit agreement?

A. Yes, it is.

Q. And is all the royalty within the unit area

committed to the unit?

A. Yes, it is.

Q. And that's all been voluntarily committed?

A. All voluntarily committed.

Q. In your opinion, would approval of this Application impair the correlative rights of any interest owner in the unit?

A. No, it would not.

Q. And in fact, they have all agreed as to how they will be paid their share of unit production?

A. Yes, they have.

Q. Will a subsequent witness address how Unocal recommends that production in the various formations be allocated from the commingled well stream?

A. Right.

Q. Could you identify now what has been marked as Unocal Exhibit Number 6?

A. Exhibit 6 is the list of the royalty and overriding royalty owners in the Rincon unit.

Q. And is Exhibit Number 7 a copy of an affidavit from Campbell, Carr, Berge & Sheridan with an attached list confirming that notice has been provided in accordance with OCD rules?

A. Yes, it is.

Q. And to whom has this notice actually been

given?

A. It's been given to all the working interest, overriding royalty and royalty interest owners in the Rincon unit.

Q. Has notice also been provided to the operators of wells within a mile of the Rincon unit --

A. Yes, it has.

Q. -- offsetting unit?

A. Yes, it has been.

Under Exhibit 8 there's a list of the offsetting owners within a mile of the Rincon unit.

Q. And when notice was provided to each of these owners, was a copy of Unocal's Application also mailed to them?

A. Yes, it was.

Q. Were Exhibits 1 through 8 either prepared by you or compiled under your direction?

A. Yes, they were.

MR. CARR: At this time, Mr. Catanach, we would move the admission of Unocal Exhibits 1 through 8.

EXAMINER CATANACH: Exhibits 1 through 8 will be admitted as evidence.

MR. CARR: That concludes my direct examination of Mr. Johnson.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Johnson, just to make sure I understand how this works out here in the unit, the working interest owners' percentage in a well or a zone doesn't change within the unit?

A. No, sir.

Q. It's fixed?

A. It's fixed.

Q. Okay. The royalty interest and the overriding royalty interest within a particular well or within a particular zone within a well may vary based upon the PAs?

A. Based upon the PAs.

EXAMINATION

BY MR. STOVALL:

Q. Let me make sure I understand that. Within, say, the Gallup participating area, the royalty interests are the same?

A. Yes.

Q. But those are different than the royalty interests in, say, the Dakota participating area?

A. They would be different in terms of percentages, but some of the same would overlap.

Q. Right, same people, yeah, that's what I

mean --

A. Right.

Q. -- would be allocated.

A. Right.

Q. Are all the interest owners the same throughout the -- all formations?

A. The working interest?

Q. No, royalty?

A. Royalty, interest? Yes.

Q. Okay, you don't have any split ownership?

A. Not that we're aware of, no.

MR. STOVALL: Okay.

EXAMINATION

BY EXAMINER CATANACH:

Q. So within a -- two different zones within a wellbore, you'll probably have the same royalty interest owners?

A. Yes.

Q. But the percentages are different?

A. Are different.

Q. Okay. Have you received any kind of -- or have you talked to any of the royalty interest owners or working interest owners about your Application, or have you received any objection of any kind?

A. We've received no objections. We received

telephone calls from five people, and we tried to return them. We were successful in one. And there were no objections; they were merely inquiries.

MR. CARR: I would also note that I received an inquiry from Russell Hedrick on behalf of Helen Harvey. They just requested information on the Application. We sent them a plat.

That was the extent of any communication I had in response to the mailing.

Q. (By Examiner Catanach) It's my understanding that the procedure you want to set up is something that -- where you -- when you file an application for downhole commingling you won't have to notify all these interest owners? That's basically the gist of this?

A. Basically, yes.

EXAMINER CATANACH: Okay, I have nothing further.

EXAMINATION

BY MR. STOVALL:

Q. I want to go back and make sure I understand one thing. When you say -- Let's look at your exhibit. I think it's 3. It has the participating areas.

A. Uh-huh.

Q. And just for simplicity, go down there to where the Largo-Gallup participating area is, and it

appears to be --

Well, let me ask you a first question. You've got two different areas bounded in red which are Mesa Verde participating areas. Are they considered a single participating area?

A. Yes.

Q. Okay. So the two, although they are not contiguous within the unit, they do share production from both --

A. Right.

Q. -- geographic areas?

A. Right, uh-huh.

Q. Now, looking at the one, then, in that Largo-Gallup area, that encompasses only two tracts out of the entire unit.

A. Uh-huh.

Q. Am I correct in interpreting that only the royalty owners in tracts 27 and 28 would participate in that production from the Largo-Gallup?

A. Only the royalty and overrides would participate in the royalty --

Q. Okay, so the --

A. -- from another tract, yes.

Q. So the royalty owners in 26 and 2, for example, would not participate in Largo-Gallup

production?

A. In --

Q. In tracts 26 and 2, which are the offset outside the --

A. Oh, no, they would not.

Q. Okay. So when you say that they are the same royalty owners, what you mean is they come from the same list --

A. Right.

Q. -- but it may not include everybody on the list?

A. That's right.

Q. Okay, that's -- I don't think that was exactly clear to me before, that...

I don't have anything else.

EXAMINER CATANACH: The witness may be excused.

MR. CARR: At this time we call Dan Seamount, S-e-a-m-o-u-n-t.

DANIEL T. SEAMOUNT,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your name and place of

residence?

A. My name is Daniel Seamount, and I reside in Farmington, New Mexico.

Q. By whom are you employed and in what capacity?

A. I'm a petroleum geologist employed by Unocal.

Q. Have you previously testified before this Division?

A. No.

Q. Would you briefly review your educational background and work experience for Mr. Catanach?

A. I have a bachelor's and master's of science degree in geology from the University of California.

I worked six years for Chevron in California, two years for the University of California, eight years for Marathon Oil in Casper, Wyoming, and five years for Unocal in Casper and Farmington.

Q. And all this experience has been as a geologist?

A. That's correct.

Q. And your area of responsibility with Unocal includes the portion of northwest New Mexico involved in this case?

A. Yes.

Q. Have you made a geological study of the

Rincon unit area?

A. Yes, I have.

Q. And are you familiar with the Application filed in this case on behalf of Unocal?

A. Yes.

MR. CARR: At this time, Mr. Catanach, we tender Mr. Seamount as an expert witness in petroleum geology.

EXAMINER CATANACH: Mr. Seamount is so qualified.

Q. (By Mr. Carr) Mr. Seamount, have you prepared exhibits for presentation here today?

A. Yes.

Q. Let's refer to what has been marked as Unocal Exhibit Number 9, and I would ask you to first identify that and then review it for Mr. Catanach.

A. Exhibit Number 9 is a well location map of the Rincon area. It's about -- Its size covers about nine miles by thirteen miles, about 120 square miles.

The Rincon unit is outlined on the map. All subsequent maps being used as exhibits in this Application will have this exact area and the exact size and scale.

There are -- 288 wells have been drilled on the Rincon unit. That's about nine wells per section.

Eighty-six of them have been completed in the Dakota. Of those 86, two have been abandoned. There have been eight completions in the Gallup and 71 completions in the Mesa Verde, and all those are still producing.

Q. Let's go to Exhibit Number 10. Would you identify that and review it for the Examiner?

A. Exhibit Number 10 is a composite type log of the six producing horizons -- reservoirs in the Rincon unit. The three that we're discussing today, the lowest one is the Dakota, average drilling depth of 7350 feet.

The next zone up is the Gallup formation.

The average drilling depth of the highest zone perforated in that reservoir is 6700 feet. That's a very continuous fractured calcareous shale.

The lower zone, which is probably the most significant producer, producing zone within the Gallup, is the Tocito sand, and that I will discuss in a little bit more detail later on.

The other zone is the Mesa Verde, and the top of the Mesa Verde is average drilling depth of 4800 feet, and it's composed of three stratigraphic units which I'll discuss in more detail in a few minutes.

Q. Okay, let's move to Exhibit Number 11. Would you identify and review that?

A. Exhibit Number 11 is a structure map on top of the Dakota. It's a contour interval of 50 feet, and from that you can calculate an average dip of one-half degree to the northeast. It's a very gentle dip. There's no anomalous structural features on the map, suggesting -- well, indicating that structure plays a very minor part in trapping of hydrocarbons in this area. In fact, we believe that all the trapping is due to hydrodynamic or stratigraphic processes.

Q. All right. Let's move now to your isopach of the Dakota, Exhibit Number 12.

A. Exhibit 12 is an isopach of -- or a net sand isopach of the Dakota. It -- Let's see, it is considered to be a net-pay map, and it correlates well with production from the wells.

As I said before, there's 86 completions in the Dakota. Contour interval on this map is ten feet. The map shows that net pay of the Dakota ranges from just under 60 feet to over 110 feet.

It's a very sand-rich system. There are a wide range of lithologic characteristics because of the variability of the environment of deposition, which ranged from continental effluvial sands at the base of the Dakota through near-shore sands in the middle of the Dakota to offshore bars at the very top.

Because it is a very sand-rich system, the reservoir can -- Well, the reservoir acts as a continuous and very correlatable reservoir throughout the unit.

Q. All right. Let's move now to Exhibit Number 13. Identify that, please.

A. Exhibit Number 13 is a structure map on top of the Mesa Verde reservoir in the Rincon. It's got the same contour interval as the structure map on top of the Dakota from a previous exhibit. You can see its got the same gentle dip to the northeast of about a half a degree.

There are 71 wells that produce from the Mesa Verde on the Rincon. The dots on the exhibit are the wells that we drilled last year, in 1992.

Q. And that plat only shows Mesa Verde completions or wells?

A. This -- That is correct.

Q. Okay. Anything else on Exhibit 13?

A. No.

Q. Let's move to the isopach, then, Unocal's Exhibit 14. Would you review that?

A. Okay, Exhibit Number 14 is a net sand isopach, based on the resistivity log using a cutoff of 25 ohm meters.

It compares very favorably with production from the existing wells. Therefore, we use it as a net pay map.

Contour interval is ten feet. The pay ranges from just under 20 feet to over 90 feet.

There are three stratigraphic units in the Mesa Verde, the lowest of which is the Point Lookout sand. It's a regressive sand, it's fine- to medium-grain and is not a very significant producer in the Rincon.

Likewise, the Menefee, sitting on top of the Point Lookout, is composed of very tight, fine-grain sandstones, siltstones, shales and thin coals, and it is not a significant producer.

The Cliff House is a transgressive sand sitting on top of the Menefee. It's fine-grain, it's got relatively good reservoir characteristics. It is very continuous throughout the north and northeast part of the unit, and it is our best Mesa Verde reservoir.

You can see the trend is northwest-southeast. It essentially paralleled the paleoshoreline at that time.

Q. All right. Let's now go to Exhibit Number 15, the isopach on the Gallup formation.

A. Exhibit 15 is an isopach of the lowest sand

member of the Gallup, and it is the most -- by far the most significant producer in the Rincon unit, and you can see that it runs generally east-west, or slightly northwest-southeast trend, paralleling the shoreline in the Rincon.

It varies from zero to over 40 feet in thickness. It is a good reservoir out here. It is an offshore sandstone. It's -- Where it exists is very continuous. It's correlatable and it's predictable.

Q. Now, Mr. Seamount, is a written summary of the geological characteristics of each of the formations that are the subject of today's Application included behind the tab marked "Index" -- or "Text", I mean, in the front of the exhibit book?

A. Yes.

Q. What geological conclusions can you reach about these formations?

A. They are all continuous across the reservoir.

Q. And these are the same --

A. Across the unit, I'm sorry.

Q. And these are the same formations and the same geologic considerations that would be involved in any subsequent application for downhole commingling?

A. Yes.

Q. Will Unocal call an engineering witness to

review the actual details of this proposed administrative procedure for downhole commingling?

A. Yes.

Q. Were Exhibits 9 through 15 either prepared by you or compiled under your direction?

A. Yes.

MR. CARR: At this time, Mr. Catanach, we move the admission of Unocal Exhibits 9 through 15.

EXAMINER CATANACH: Exhibits 9 through 15 will be admitted as evidence.

MR. CARR: And that concludes my direct examination of Mr. Seamount.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Seamount, what further development do you see within the unit for each of these pools or zones?

A. There are a lot of -- There are many Dakota -- undrilled Dakota locations based on 160-acre spacing. There are probably 33.

As far as the Gallup is concerned, we've only made eight completions in the Gallup on the Rincon. We space them 160. I think there's something like 33 -- 32 sections out there, so it would be, you know, well over 100 potential Gallup locations.

And Mesa Verde -- These exhibits -- the maps

of -- the isopach of each zone shows only the wells that are completed in that zone, and you can see there are quite a few potential locations that we could drill down the road when the economics are more favorable, when we get outside the better trends.

Q. Do the different zones within the unit, the Mesa Verde, Dakota and Gallup, do they exhibit different producing characteristics within different areas of the unit, generally?

A. I think our next witness could probably answer that better, but I don't -- I haven't seen it from our production out there.

EXAMINER CATANACH: I think that's all for now. I may have something else later, but...

MR. CARR: All right, then at this time we would call William L. Irwin.

WILLIAM L. IRWIN,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your name and place of residence?

A. William Irwin, Farmington, New Mexico.

Q. By whom are you employed?

A. Unocal.

Q. And in what capacity?

A. I'm the district petroleum engineer.

Q. Have you previously testified before this Division and had your credentials as an engineer accepted and made a matter of record?

A. Yes, I have.

Q. Are you familiar with the Rincon unit?

A. Yes, I am.

Q. Are you familiar with the Application filed in this case?

A. Yes.

Q. In fact, it was filed pursuant to a conversation you had with the Examiner; is that right?

A. Yes, that's correct.

Q. Have you prepared certain exhibits for presentation here today in support of Unocal's proposed administrative procedure for downhole commingling?

A. Yes, I have.

MR. CARR: Are Mr. Irwin's qualifications acceptable?

EXAMINER CATANACH: They are.

Q. (By Mr. Carr) Mr. Irwin, would you refer to what has been marked as Unocal Exhibit 16, identify this exhibit and review it for Mr. Catanach?

A. Okay, just to begin with, though, I'd like to say that these exhibits, 16 through 20, were prepared following discussions with Mr. Catanach regarding some of the economic parameters that would handle commingling at the Rincon unit.

The first exhibit, Exhibit 16, is production type curves for the Dakota, Gallup and Mesaverde horizons at the Rincon unit.

These type curves are what our economics are based upon. I'll get into the economics in a minute. I'd just like to point out how these type curves were constructed. Their basis is initial production rates of 450 MCF per day for the Dakota, 200 MCF per day for the Gallup, and 250 MCF per day for the Mesaverde -- Sorry, other way around. 200 Mcf a day for the Mesaverde, 250 MCF a day for the Gallup.

Those initial production rates are based on our actual sales volumes from our recent infill drilling program that was completed in 1992, and the wells have come on production in the last four months. So we feel that those are very realistic initial production rates. These are not, you know, one-point tests or anything like that.

Q. And so what you've done is, you've actually averaged the actual produced volumes?

A. That's correct.

Q. Okay. And then how did you get your curves?

A. And then the declines predicted from that point on, on this plot, which plots standard cubic feet -- thousands of standard cubic feet per day, versus years on the bottom scale, the declines there are based on historic average declines that we see at the Rincon unit: seven percent in the Dakota, nine percent in the Mesaverde and eight percent in the gallup.

That was also tempered with -- In the Mesaverde case, the decline is also related to the infill wells that have been drilled in the Mesaverde in recent history.

Q. All right, Mr. Irwin, let's go to the material behind Exhibit 17, and I would ask you to identify those for the Examiner.

A. Exhibit 17 is production curves, thousands of cubic feet per day versus calendar years. These production curves are for 17 wells, which are infill Mesa Verde wells drilled in the Rincon unit in the late 1970s and early 1980s. These production curves were used to verify the type curves that you saw in the previous exhibit.

Q. So the declines that you have reported were based on the information in this portion of the exhibit

book?

A. That's correct.

Q. What is behind tab Exhibit 18?

A. Exhibit 18, again, is production curves, in thousands of cubic feet per day of gas production versus your annual time on the bottom scale.

These production curves were -- are for six Dakota wells and five Mesa Verde wells that are part of our 1992 drilling program that have come on production in the last four months. So this demonstrates those initial production rates that I referred to, that the type curves were constructed off of.

Q. Let's go now to the material behind Tab 19.

A. Okay, 19 is the summary of economics that this other work is derived from. We have three columns here, a single-well summary of economics, dual and commingled wells.

The single well in this summary is a Mesa Verde. We estimate we can drill a Mesa Verde well for $550,000 in the Rincon unit. We used an average gas price of $1.40, which was kind of a current net back price we're seeing at the Rincon unit.

We used that initial production rate on the type curve of 200 MCF per day, and the decline according to the type curve, and we used calculated

recoverable reserves for a single Mesa Verde on the Rincon of 700 million cubic feet, which is .7 BCF, and we see a rate of return from our calculations of 1.2 percent. This is unacceptable at Unocal's rates for investment opportunities.

The next two columns are a dual well and a commingled well. Assumptions for the dual-well economics is a $950,000 drilling cost. Once again the gas price is kept constant at $1.40. Initial total rate of 650 MCF per day is the Dakota Horizon of 450, plus a Mesa horizon of 200, and the recoverable reserves calculated were 2.527 BCF. This yielded a rate of return of 13.9 percent, which was below Unocal's acceptable investment opportunity limits.

Typically in the industry, between 15 to 20 percent is what is considered an acceptable investment opportunity.

And then in the third case, we show a commingled well that's for $750,000 drilling cost. The $200,000 reduction in drilling cost is essentially the difference between a dual well and a commingled well, is essentially $100,000 relating to surface facilities and equipment that you don't require in a commingled well, as well as a tubing string that's not required, and about $100,000 in incremental drilling costs for a

dual well over a commingled well, because of the differences in sizes of casing, so --

Q. If we look at this exhibit, in your cost column, those are actual costs based on recent activity?

A. That's correct. We drilled -- We had a 24-well drilling program in 1992, which would equate to about this commingled well cost. We drilled that size hole, 5-1/2-inch casing was set, and to date our average well cost has come in right at between $750,000 and $800,000. So it compares -- This is directly derived from that program.

Q. And you've just estimated a gas price?

A. Yeah, gas price, again, relates to our current net back out at the Rincon, and that was held constant.

Q. Your initial total rate relates back to Exhibit Number 16, correct?

A. Right, and it's the same as in the dual well case.

Reserves are slightly increased because of a lower operating cost associated with a commingled well versus a dual well.

Q. And these reserve figures were based on what? Volumetric calculations?

A. Volumetric calculations and related to the parent wells off of historic decline curve analysis.

Q. And then the others are just calculations -- are a result of those initial parameters?

A. Right, so the resulting rate of return is greater than 20 percent in the commingling case, which is acceptable in our view.

Q. In your opinion, Mr. Irwin, is it economically feasible for Unocal to drill and complete separate wells to produce the remaining reserves in the Gallup and Mesa Verde formation in the Rincon unit?

A. No, it is not. Our analysis here indicates that we would not drill single Mesa Verde development wells.

Q. Will the value of the commingled production in these wells exceed the value of the production from the individual zones?

A. Yes, it will.

Q. In fact, you will recover production that otherwise would not be recovered?

A. That's correct. And actually we estimate that in the Mesa Verde reservoir alone, there's up to 17 BCF of reserves that we otherwise wouldn't drill for.

Q. Has production from these same formations

been commingled in the wellbores of other wells in this unit area?

A. We have currently in the Rincon unit seven commingled wells. Three of those are the recent applications we've made, two of them are Dakotas, and one of them is Gallup, a historic Gallup.

Q. Based on this experience, do you have an opinion as to whether or not the reservoir characteristics of these formations are such that underground waste will not occur as a result of the proposed commingling?

A. Yes.

Q. And what is that opinion?

A. That there will be no waste.

Q. Now, let's go to the material behind Exhibit tab 20. Would you review that for Mr. Catanach?

A. Twenty is a sample allocation formula that would accompany individual applications and administrative procedure.

This is just to demonstrate that -- And this would be based on our C-116s, which is an initial test rate, which is not the same as production. It is likely two atmospheres. Each zone would be separately tested with the packer separating the zone, and then an allocation for both gas and oil, an allocation would be

derived that's shown in this exhibit.

I'd like to point out that these rates, like on the sample calculation, would be likely higher than you would actually produce because of the lower back pressures of producing to atmosphere during the test.

Q. The allocation should remain valid using this testing procedure?

A. Yeah. The allocation is relative, though, and it would remain a valid -- a measure.

Q. And in the future on a well-by-well basis you would recommend an allocation be set for each well based on separate testing of each zone?

A. Right, because each well has individual characteristics.

Q. How does Unocal propose the administrative procedure that it's seeking in this hearing actually work?

A. We would still apply on an individual-well basis, as outlined in Rule 303-D, and meet all the reservoir parameters that are required, pressure, fluid compatibilities, et cetera.

So the Application would take the same form as it has.

Q. But you wouldn't be required to give notice to every interest owner in the unit?

A. Correct.

Q. And you wouldn't also, with each of these, be required to come in and re-explain the economic considerations behind your commingling program?

A. Correct.

Q. Other than that, you would simply follow Rule 303-D?

A. 303-D, yes, that's correct.

Q. In your opinion, will approval of this Application and further development of the Rincon unit area by downhole commingling of the Mesa Verde and the Gallup with Dakota production be in the best interests of conservation, the prevention of waste and the protection of correlative rights?

A. Yes.

Q. Will approval of this Application result in the most efficient and effective way of producing the remaining reserves in the Rincon unit?

A. Yes, it would, and in fact we feel that without commingling there's -- well, with commingling we will recover reserves that would otherwise not be recovered in this unit.

Q. Were Exhibits 16 through 20 prepared by you or compiled under your direction?

A. Yes.

MR. CARR: At this time, Mr. Catanach, we would move the admission of Unocal Exhibits 16 through 20.

EXAMINER CATANACH: Exhibits 16 through 20 will be admitted as evidence.

MR. CARR: And that concludes my direct examination of Mr. Irwin.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Irwin, there was a number thrown out earlier about 75 possible wells that this commingling would occur in within the unit.

A. Yes, I can give you detail on that if you would like.

Q. Well, maybe not detail, but generally are those wells -- They have not been drilled yet?

A. No, that's a total number. You heard Mr. Seamount testify that there was 33 possible undrilled locations, Dakota locations, and those would be Dakota locations you could commingle with an uphole zone, be it a Gallup or a Mesa Verde, that otherwise we wouldn't drill for singly, so that's 33.

There's 23 current producing Dakota wells that we could complete a second zone in, be it a Gallup or Dakota -- or Gallup or Mesa Verde zone, uphole.

And the balance there -- What's that get us to? 56? The balance to take us to 75, I think, would be another 24? Is that correct? No, 14.

MR. STOVALL: 19?

THE WITNESS: 19, let's try 19. There.

Now, that is actually the number of wells that -- Of the recent 24-well drilling program that we just completed last year, about 19 is the number of wells that we could commingle in that last group of drilling wells that we just completed.

I think we've submitted five of those prior to this hearing. Three of them were approved by you. So that would leave what? Sixteen more that we could apply for.

Q. (By Examiner Catanach) Would those recently drilled wells -- are those all Dakota completions?

A. They're all Dakota, and they have a second zone, either a Gallup or a Mesa Verde.

Currently they're all completed with a packer between the zones. However, if we -- if they meet the individual well requirements for pressures, fluid compatibilities, et cetera, when we apply, then each one of those could possibly be a commingled well.

Q. Is it my understanding they're all dually completed?

A. No, they have a single string isolating the zones. Only one site of the Dakota is on production. We can't bring the second site on at this time.

Q. Okay. Now, there's three different possible producing zones in here. How do you determine which two in any given wellbore will be commingled?

A. Generally it would be depending on the geological characteristics, if you're in an area that's better for Gallup or an area that's better for Mesa Verde for your second zone, or if it's -- whichever looks economically the best. The Gallup is -- It's generally a tradeoff. They're fairly comparable zones.

Unless you can get into an area, as Mr. Seamount Suggested, where there's a Tocito sandbar associated with the Gallup, then you could get a better Gallup. But in that case we don't have very many of those locations.

As a matter of fact, the Gallup -- the Tocito sandbar in the southern part of the end of this is pretty much drilled up. So it would be just a fractured-shale type of Gallup we'd be going after, and that has not proved to be very significant at this point. So it's really -- Mesa Verde or Gallup is really a tradeoff, you could go either way on it.

Q. Is it conceivable that Unocal might want to

commingle all three zones in any of these wellbores?

A. We -- well, we run into -- allocation -- It becomes more difficult to do when you have more than two zones in a wellbore, and we have not commingled more than two ever.

I can't see it at this point in time. It is conceivable, but it's not our general practice.

Q. Okay. The initial production rates that you've got for all three zones, those are based on recent completions; is that correct?

A. That's correct.

Q. And that's just an average?

A. That's an average. And the actual deliverabilities to pipeline were as reported on our C-115s.

Q. Do you know what the range of those production --

A. Yes.

Q. -- tests have been?

A. The Dakota Range is anywhere from a low of about 150 MCF per day to a high of closer to 600 MCF per day. And the Mesa Verde ranges from a low of about 50 MCF per day up to 300 MCF per day, and that's obvious in those exhibits.

However, it should be noted that these -- the

Dakota and the Mesa Verde are prorated pools, and the maximum allocation that we see in a Mesa Verde 320-acre proration unit has been historically above 500 MCF per day.

So that has to be shared between two wellbores within that 320 if these are infill wells.

Generally, your maximum that we've ever seen allocation between two wells is about 250 MCF per day if you give half to each well.

So regardless of the initial production or the capability of the well, you are limited by the allocation.

EXAMINATION

BY MR. STOVALL:

Q. That raises another question then.

If you've got a commingled stream and one of the formations is restricted by the proration formula and the other one is not, how would you manage that?

A. You're still limited by your -- Well, you allocate between the zones, and you're still limited by your allocated zone.

Q. In other words, if you reach your limit you have to shut in the whole well?

A. That's correct. So it would be your limiting factor, your allocated zone or prorated zone.

EXAMINATION

BY EXAMINER CATANACH:

Q. Okay, you said -- That's the Mesa Verde you're talking about that's been --

A. (Nods)

Q. You've seen a maximum of about 250?

A. About 500 for the entire proration unit, so you're generally sharing that between two wells.

Q. How about the Dakota?

A. The Dakota is prorated, and I don't have a number for allocation, a maximum that we've seen for a proration unit. I don't want to guess.

Q. But you'd still have probably the same problem with the Dakota and --

A. The Dakota has to share as well.

Q. Is there any danger in having to shut these wells in, these commingled wells in?

A. Should not be. If we meet the pressure requirements under the 303-D, then there's no danger of cross-flow.

I would not want to shut them in for extended lengths of time.

But Unocal has historically been able to sell all the gas from the Rincon unit. We have not had any shut-in periods for any extended lengths of time since

we've gained operatorship and the markets have been deregulated.

There -- If you did get to an extended shut-in, we have packers in the hole so you can isolate the zones, if you need to slide a sleeve to isolate a zone.

Q. The wells will be equipped where you could just shut one zone off?

A. Currently all the new wells that we've drilled, we have packers isolating the zones with a sliding sleeve. We shift that sliding sleeve, you could produce both zones up the tubing.

So yes, the answer is, you can isolate the zones. And we've put that in there so you could also test the zones independently as well.

Q. Okay. You've got, in your economic summary, a difference of $400,000 for a single well versus a dual well. Why is that such a big differential there?

A. Well, the dual well is a deeper horizon, you're drilling to the Dakota. Mr. Seamount referred to the drilling depths. A single well in shallower -- in -- not as deep, it also is a narrower wellbore. It typically would drill either 5 1/2 or -- probably set 5 1/2 casing. Dual well, you'd go to 7 1/2 with two strings of pipe.

In a single well you're completing only in a

single zone. And in a dual well you've got the Dakota you're completing, as well as the uphole hole, be it a Gallup or a Mesa Verde.

So there's significant differences all the way along.

In addition to the additional surface facilities necessary for a dual well, you've got to have two dehydrators, two separators, two meter runs, dual facilities all the way on the surface. Single well, obviously you don't have that, or in a commingled well.

EXAMINATION

BY MR. STOVALL:

Q. Actually, it seems to me that might be a bit of a distorted comparison, because in order to produce two zones you'd have to have two single wells, though; is that not correct?

A. Well, a Dakota --

Q. You're saying the Dakota's already there, so that's a sunk cost, and this is the incremental cost?

A. The Dakota, you could actually justify drilling for independently, you may be able to. But that's not the issue.

It's whether you could go after these uphole zones, the Mesa Verde or the Gallup. And it's just

demonstrating that a single well, you would not drill for the Mesa Verde or the Gallup.

Q. Okay, but your economics look even better if you put in the cost of both a Dakota well and a shallower well.

A. Yeah, you need to combine something out there to make it economic.

Q. In other words, the dual-well column and the commingled-well column reflect the cost to drill a well and produce from two zones, whereas the single-well column only reflects the cost to drill and produce from the shallower zone?

A. Correct.

EXAMINATION

BY EXAMINER CATANACH:

Q. What do the economics look like as far as drilling a Dakota well, producing the Dakota reserves and depleting the Dakota and coming up and producing the Mesa Verde and the Gallup or whatever?

A. Well, the majority of the Dakota wells that we have in the unit, aside from the recent drilling program, are 30-plus years old, 30 to 40 years old.

So the lifetime of the Dakota reserves, and there's still most of them on production. So the lifetime of your Dakota reserves are 40-plus years.

So if you were to wait to plug back to the Mesa Verde or Gallup on any infill wells, the present value of that is zero because it would be too far in the future to have any present value.

MR. STOVALL: Is there also a possibility that your wellbore is not going to be any good by then?

THE WITNESS: And -- Yes.

Q. (By Examiner Catanach) I know we previously discussed -- Before the hearing we previously discussed thresholds of initial production rates that would qualify for downhole commingling.

You've got a number of 650 MCF a day here. Is that about what you're looking at in terms of being able to commingle zones?

A. Well, again that's the average that we've seen from our recent infill drilling program. For a Dakota our average -- of the first six Dakotas we've delivered to date in the last four months, and the first five Mesa Verdes that we've delivered in the last four months.

So that's a realistic average delivery number that we've seen initially.

And economically, as I stated before, you're limited by your allocation, and you have to share that allocation with the parent wells.

So I think generally out here you're not going to see any wells that are going to exceed this.

Now, on an individual well basis we will apply, and so the parameters can change on it, because every well has its own reservoir characteristics.

But generally, this is what we've seen to date on the new wells we've applied for.

Q. Well, are your existing Mesa Verde wells -- Are they producing at an average of 250 MCF a day?

A. No, no, the current Mesa Verdes are probably on the order of 100 MCF a day.

The history for the infill wells that were drilled in the late 1970s and the early 1980s is included under Exhibit 17, and there's a -- Every well has its own characteristics, but you can see if you go to just about any well it varies, but it will be anywhere from 200 MCF a day down to 50 MCF a day, so... And that's off of infill wells drilled in the last 10 to 15 years.

Prior to that, the original parent wells are probably at some lower production rate than this, being that they would be at lower pressures.

Q. So realistically, with the infill -- Well, the new wells that you'll drill and complete in the Dakota and Mesa Verde, they'll generally have a higher

allowable at 250, they may 400 or 450 or whatever, depending on what the parent well makes?

A. That's correct.

Q. So you may have an allowable for that well of, you know, whatever, 800 or 900 a day or something?

A. Combined. You could conceivably have one at 900, yes.

Q. In terms of the Division setting an initial producing rate, saying, yes, we can approve these, and no, we think this rate's a little too high, what's your opinion of that?

A. I wouldn't want to set a rate, because the economics aren't just a rate. It depends on the -- obviously, the reserves and the operating costs and other parameters, and your initial capital costs that go into economic calculations.

So to say that one rate is economically viable over another rate isn't really the question. It's whether the well is economically viable.

And I've just demonstrated the economics here. I mean, we can do a whole range of economics for different rates. But your reserves don't really change, and so the economics are not going to vary that much, and in that your allowable limited -- you know, you're not going to have a well that's going to be

capable of two to three million a day; it's always going to be within that 500 MCF or less for that Mesa Verde horizon.

So in general, your single-well economics, like for the Mesa Verde stand-alone case, are always going to be poor, regardless of how the parent well -- or how good an initial rate you get. You're going to be tapped out, and it's still likely not economic to drill that stand-alone Mesa Verde or Gallup.

MR. STOVALL: In other words, there is no rate for either formation above which you would say commingling should not be permitted? Is that the short answer? Or do you have a short answer for that question, I guess, is the --

THE WITNESS: Well -- Do you went to resubmit this, or can I show that?

MR. CARR: We have a rate-of-return-based sensitivity graph that might be useful, we could mark as Unocal's Exhibit 21, and Mr. Irwin could review that. I think that might respond to some of your questions.

EXAMINER CATANACH: Okay, let's do that.

MR. CARR: How many copies do you have?

THE WITNESS: One copy. I'll have to send it back to Mr. Catanach and --

MR. CARR: Can you review it, or do you --

THE WITNESS: Yeah.

MR. CARR: -- make copies?

THE WITNESS: No, go ahead and hand it in and we'll get copies later.

This plot that I will show as rate-of-return sensitivity analysis for that stand-alone Mesa Verde drilling cost of $550,000.

And what it demonstrates is that because of your -- because of the 320-acre proration allowable, even if you max out -- even if you get a very good well, a well that's capable of, let's say, a million cubic feet per day of production, you're limited by your proration, your allocation for that 320-acre proration unit.

So you still have to share that proration, some percentage, with the parent well, that allocation with the parent well.

But your rate of return is never going to be significant, and if you can see, it will be somewhat -- around 20 percent or less for that single Mesa Verde, so...

And if you divide it 50-50, the allocation between the parent well and the infill, your rate of return on it, if you went to 250 on this bottom scale

there, you could see -- It would be what? Something less than 15 percent, I believe.

MR. STOVALL: It's actually closer to seven percent, it looks like.

THE WITNESS: Oh, seven percent, yeah. I can't...

So in any case, it's not something we would probably consider economic to drill a stand-alone Mesa Verde or Gallup out here. So we would feel that you would have to commingle that second site.

Q. (By Examiner Catanach) Realistically, though, you're not going to have a 50-50 split on the Mesa Verde?

A. No, it could be somewhat higher than that, but it's still probably something we would not do.

EXAMINATION

BY MR. STOVALL:

Q. What you're saying is, even if you got to put all of the production of a very good well, if you only had the one well there, you're still going to be limited in your rate of return to somewhere in the low-20-percent range because of the allocation factors?

A. In the maximum case, yeah, which is why we don't drill any Mesa Verde or Gallup wells stand-alone.

We have -- In this recent program they're

actually targeted for the Dakota and then bring the second site in.

Q. Just hypothetically, if the -- always hypothetically when you talk allowables -- if the market situation were such that that allowable were raised, would that -- I mean, that would obviously change your -- In other words, your economic line here flattens out because of your allocation formula, not because of the --

A. Right.

Q. -- capacity of the well?

A. Yeah, and like I said, that maximum that we've ever seen for a 320 proration unit is 500 MCF per day to share between the parent well and the infill well.

It could go up, hypothetically. However, the productivity of these wells -- This reservoir, the Blanco-Mesa Verde and the Rincon unit is in its depleting stages. Reservoir pressures are low. Parent wells are under a thousand -- probably closer to 600 pounds or less. Infill wells we've seen to date are about 1000 pounds.

So it's a depleting reservoir, so you're not going to get significant initial flow rates.

Q. Is there any concern that those allocation

factors could go down? I mean, is that one of the things that Unocal worries about, is whether the allocation -- the level the allowable could go down?

A. We always worry about that.

Q. Since you've raised this subject, it's not really on this issue, but has Unocal looked at the possibility of seeking a minimum allowable in either of the pools?

A. We have in the South Blanco-Pictured Cliffs. We --

Q. You didn't ask for one, but you got one there; isn't that correct?

A. Yeah, we made an effort to de-prorate that pool, but we did receive a minimum allowable there.

We haven't addressed it in either the Blanco-Mesa Verde or the Basin-Dakota, but we are looking into that with some other operators.

EXAMINATION

BY EXAMINER CATANACH:

Q. On an individual application for downhole commingling basis, maybe it would be more enlightening to look at not really the initial production rates but what kind of allowables you're sharing, what kind of rates this well may be limited to, in terms of determining whether it should qualify for commingling.

Do you think that's a correct statement?

A. Yes. We wouldn't object to that, and we're not presenting these economics to remove that consideration in the rules completely.

The idea here is to give you a general feeling for what our economics look like in the Rincon unit for commingling.

Of course, every well, like I said, has its individual characteristics, and it should likely be addressed on an individual-well basis in an administrative procedure.

Q. Well, do you intend to address the economics on an individual-well basis?

A. That's --

MR. STOVALL: I think he's saying, do you intend to ask him to?

MR. CARR: That's the question.

Q. (By Examiner Catanach) Well, you're saying it should. I don't know how much you want to go into it on the --

EXAMINATION

BY MR. STOVALL:

Q. Well, let me back up again. You know, where we're coming from, I think, where the Examiner is coming from is, is there a point at which commingling

should not be allowed and basically we're talking at a production level?

If I hear your answer correctly, you're saying no, there is no production level, given both the prospective deliverability of a well and the allowable formula and historic levels of allowable, at which commingling should not be considered, because even if a well is a high potential it is still going to be restricted, and therefore production will always be based upon historical information at a level at which commingling should be allowed; is that correct?

A. Correct. But that is just, of course, one parameter, and that's what I'm saying. When we look at the economics of commingling, the rate -- whether we talk about the initial rate, but also the allowable.

But there's other parameters that go into whether a well should be economically allowed to commingle beyond -- We're talking about reserves and et cetera into the economics.

So it's not just rate. And so that's why I would hesitate to pin -- put my finger on a rate, initial production rate, to commingle on a --

Q. Well, let's back it up again and then look.

Assume that -- Take the allowable question out of the picture for the moment. If there were no

production restrictions on the well, regulatory production restrictions, and you got a good well, there is a threshold at which that could be an economic well for you; is that correct?

A. That's correct. But then again, it also depends on the reserves associated with that well. A rate does not --

Q. The rate over a period of time gives you the total return on the well, is what you're saying?

A. Right, but as I submitted in Exhibit 16, the type curve, production type curve, all these are tight gas sands for the most part. They start at high initial production rates, rapidly decline, then level off at some constant decline throughout their life.

So the area under that curve is then the reserves associated with that well, and each of these different formations has their own characteristic.

But it's not rate alone that determines the economics. So it's obviously other parameters: investment, operating costs, which are generally the same for most operators, but it's -- The big one is the reserves associated with the well.

And at this late stage in the life of these reservoirs, the Blanco-Mesa Verde and even the Basin-Dakota and the Largo-Gallup, there's -- the reserve,

the remaining reserves associated with each infill well is -- it's getting smaller every day.

And the numbers that I quoted were, I believe, 700 million cubic feet for the Blanco-Mesa Verde, and that's -- It's not a significant reserve volume associated for a well.

Q. Let me ask the question in another -- or another question on that.

And again taking the allowable restrictions out of the picture, given those things that you just talked about, from a pure engineering standpoint would you say that the most economically effective way to produce this area would be through commingling like this, regardless of rates, just to keep your costs lowest and maximize your return based upon the reserves?

A. By far and away the most economic. And I think in the future, in the San Juan basin, we'll see more commingling to maximize the amount of reserves attained at the late stages of the lives of these reservoirs.

Q. Now, given that fact, is there anything from an engineering standpoint that would cause you concern, so far as either effect on the wellbore or effect on the reservoir or anything that could mechanically

happen, that might conceivably cause waste because of commingling, at any rate?

A. Not if proper production practices are followed, and --

Q. What do you -- What are proper production practices?

A. Well, you would have the ability to isolate your reservoirs, and that's the key. If extended periods of shutdown are foreseen, if you have the ability to isolate reservoirs then they're -- and regardless of pressure considerations, but you have the ability to isolate reservoirs, then that will effectively eliminate any possibility of waste or cross-flow or --

Q. In other words, if you got some -- for some reason you got a substantial pressure differential between the reservoirs, the ability to say, okay, isolate them and prevent the --

A. Well, we have -- In Rule 303-D, or -C, you're required to be within 50-percent pressure difference between the two zones, taken to a common datum.

With that initial hurl rate, that's the starting point. I mean, from there you can ensure that you're likely not going to have cross-flow or have any waste associated with that commingled well.

But then the next step is to ensure that you have ability to isolate if necessary.

Q. Next question would be is if, basically, there were no limitations put on rates, or commingling were allowed under this procedure, would you recommend that there should be any sort of periodic testing to make sure that the allocation ratios continue to be correct over a period of years?

A. I don't know if I should -- that would be -- We don't see the need to allocate.

Q. I'm asking you as an engineer --

A. Yes --

Q. -- not as a regulator or any- --

A. No --

Q. Is it likely to change? You've given a method of doing it which is based upon initial production rates.

A. Right. And no, because the reservoirs that we see, that we work with here and the ones we're applying for, generally follow, as you can see in our type-curve analysis, the same type of decline performance, the same shape of curve and the same his- -- though they have slightly varying historic decline rates, they're all in the same trend, no, beyond your initial allocation you should not be

required.

If you had different types of reservoirs associated here, that had different decline-curve shapes, then you might want to consider testing down the road.

But for these reservoirs, no, beyond the initial tests I don't think it would be necessary, especially at this late stage in the completion of the life of most of these reservoirs.

Q. And the only correlative-rights issue is that of the non-cost-bearing interests, the royalties and overrides; is that right? Because that's the only difference in who shares in production revenue?

A. I believe that was addressed in the --

Q. Yeah, I think that -- I'm just -- You know, you heard the landman's testimony, and is that your understanding, I guess, is what I'm --

A. (Nods)

Q. It's all managed by -- All the wells are operated by Unocal, so there's --

A. Correct.

Q. You don't have operator differences in terms of how things would be done?

A. No, and I believe all those royalty owners ratified the unit agreement. And when they do that,

it's my understanding -- Well, I won't speak on that, it's not my area.

MR. STOVALL: Yeah, you're getting into Carr's area.

MR. CARR: You're just practicing law.

MR. STOVALL: That's all right, we practice engineering every now and then.

MR. CARR: Sort of, sort of.

Q. (By Mr. Stovall) And that -- I do have a -- When we finish, I do have question that probably needs to go to the landman.

EXAMINATION

BY EXAMINER CATANACH:

Q. The 17 BCF total reserves, that's the -- that would be the resultant recovery of drilling the additional wells?

A. That is our current reserve number that we carry on our books on a gross basis for proved but undeveloped reserves in the Mesa Verde, in the Rincon Unit.

Q. That's just the Mesa Verde?

A. Yeah, that's just the Mesa Verde number.

There's also associated undeveloped reserves in the Gallup. But at this time we wouldn't develop those reserves without the ability to commingle.

That's what that number is related to.

Q. Okay. The Dakota wells that you propose to drill or will drill, are those all infill?

A. The 33?

Q. Right.

A. Yes. The Dakota is -- The entire unit is completely drilled up on 320-acre spacing --

Q. In the Dakota.

A. -- and half of the unit is drilled up on the 160-acre spacing.

So the remaining 33 wells that I stated, that would be the -- that would completely infill drill the Dakota on 160-acre spacing.

Q. So all the wells that you would propose to commingle should have a parent well in the Dakota, may or may not have a parent well in the Mesa Verde?

A. For the most part, has a parent well in the Mesa Verde, but in some cases may not.

Q. Maybe it would be useful, when you apply for these individually, to kind of summarize what's going on within the whole proration unit, and maybe give a forecast of what kind of production you're getting from the parent well and what you think you'd be allowed to produce from the new well. That may be really useful.

A. That's a good point, yes.

Q. Along with initial rates and that sort of thing.

The allocation -- Now, you're not proposing that this allocation be used for each well?

A. No, that's just a sample --

Q. Okay.

A. -- of the type of calculation that goes into an allocation.

Q. Okay. You would propose to test individual zones when the well is drilled?

A. Correct.

Q. How long?

A. We do a seven-day test and attempt to stabilize the wellbore after extensive cleanup of frac, so the -- of completion fluids, so we have no completion fluids associated with it. So it's a seven-day test.

And then we go into a seven-day shut-in and measure the pressure.

Q. Okay.

A. And that production rate that's shown there would be the last point from that seven-day test.

Q. Something I hadn't thought about is, for prorated pools you're required to run an annual deliverability test; is that correct?

A. Yes.

Q. How would you -- Would you even think you would have to do that under the proration rules if you were commingled? I haven't ever thought about this.

A. Neither have I.

MR. STOVALL: That may answer my question about the --

EXAMINER CATANACH: It may.

MR. STOVALL: -- addressing the ratios if you've got to do that anyway.

Q. (By Examiner Catanach) But would you still be capable, the way you propose to complete the wells, to do that?

A. Our current production practice, we would be capable.

MR. STOVALL: You mean with your packer that you put in your --

THE WITNESS: The packer --

MR. STOVALL: -- to isolate the zone and test each --

THE WITNESS: I don't know if that's a viable long-term solution, because with -- and this is a production concern -- with a sliding sleeve and a packer, which gives you the ability to isolate zones and then commingle zones, they tend to scale over

years, your sliding sleeves do. And when they do scale it becomes difficult to shift that sleeve, and it would become -- it could, down the road, become difficult to isolate zones.

So, you know, if you have to do it on an annual basis, I don't know if -- I don't know how well that would work, because we haven't done it beyond one year, so --

EXAMINER CATANACH: And I'm not sure that it would be required. I think we'd have to talk to Frank Chavez up in Aztec and see what he thought about it.

MR. STOVALL: I think where it would become an issue is probably on the better wells which had a high deliverability in their early life. He's going to want to look and see what your decline is, because that is going to affect your allowable on those wells --

THE WITNESS: That's correct.

MR. STOVALL: -- in both zones.

THE WITNESS: So again, it might be on an individual-well basis.

MR. STOVALL: Well, let's take that. And you probably don't have -- Since you haven't thought of the question you probably don't have the answer, but is there a production threshold for either zone below which you would say deliverability probably ought not

to be required?

You don't know what the number is, of course, because you haven't thought about it, right?

THE WITNESS: No, but that would also come back to the issue on prorationing minimum allowables too. It may be related to that threshold.

EXAMINER CATANACH: Interesting.

Anything else?

MR. STOVALL: It's easy.

I do have a question, and I will throw it out and either let you or Mr. Johnson answer it, is, when I look at the participating area map -- What is that? Five?

MR. CARR: Three.

MR. STOVALL: Three?

-- the Gallup participating area is only 320 acres. From the discussion here I gather that there are a whole lot more Gallup wells than just the ones within that defined participating area, that you might be talking about bringing under this commingling program; is that correct?

Go ahead, Mr. Johnson. Why don't you come up closer where the court reporter can hear you, and then --

MR. JOHNSON: Yes. I'm sorry. There is more

Gallup wells that will be brought into the program --

MR. STOVALL: How will --

MR. JOHNSON: -- are there not?

THE WITNESS: Yeah, I can address that if you'd like.

MR. STOVALL: Well, you can answer the question about whether there are wells outside that participating area that would be brought in.

THE WITNESS: Currently, in our recent program, there's three undesignated Gallups that could be brought in there, and there's not -- They're designated because they're more than a mile away from the current Largo-Gallup pool boundary.

But there is a possibility to bring more Gallup -- The flow rates we've seen or the production rates we've seen to date on those new wells, they haven't been -- they've just been tested; they haven't been delivered yet. That's -- production curves.

But they're not sig- -- They're like the 100 MCF range. That's out of the fractured shale, not the Tocito sand stringer.

So we have not seen what I would call encouraging Gallup results, but it may be significant enough that you might develop it if you could commingle it.

MR. STOVALL: And then I guess that would raise the next question, Would you -- From a land standpoint, would you propose to then expand the Gallup participating area to bring them in and --

MR. JOHNSON: If the Bureau of Land Management would allow, if the wells would qualify.

MR. STOVALL: As commercial wells or --

MR. JOHNSON: As commercial wells, we would expand the participating area.

MR. STOVALL: And of course that might be affected by whether they are commingled or not. If they're commingled, they may be commercial.

MR. JOHNSON: That's true.

MR. STOVALL: Who knows, right?

THE WITNESS: And it's also up to the Bureau of Land Management's economic hurdles too, which are, you know, different than --

MR. STOVALL: If they are not brought into the participating area, would you then just propose to allocate the production to the Gallup on a tract basis?

MR. JOHNSON: On a tract basis. That's the way it's allocated under the unit agreement.

THE WITNESS: The working interest doesn't change.

MR. STOVALL: Right, I understand that.

We're talking royalty.

MR. JOHNSON: Just royalty and overrides, right.

MR. STOVALL: So it is not a problem from the standpoint of who gets the Gallup share of the gas, even if it's not in a participating area; you can deal with that.

MR. JOHNSON: Right.

MR. STOVALL: Okay, that's all I have.

EXAMINER CATANACH: That's all I have.

MR. CARR: I would move the admission of Unocal Exhibit Number 21.

EXAMINER CATANACH: Exhibit 21 will be admitted as evidence.

MR. CARR: And that concludes our presentation in this case.

EXAMINER CATANACH: Okay. There being nothing further in this case, Case 10,663 will be taken under advisement.

(Thereupon, these proceedings were concluded at 9:46 a.m.)

* * *

CERTIFICATE OF REPORTER

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

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; 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 February 6, 1993.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1994

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 10603 heard by me on February 4 1993.

David R. Catanach, Examiner
Oil Conservation Division