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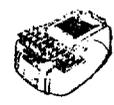
formula for the Basin-Dakota Gas Pool, San Juan, Rio Arriba and Sandoval Counties, New Mexico, which will differ from the allocation formula prescribed for the prorated gas pools of Northwest New Mexico by Rule 9 (C) of Order No. R-1670.

MR. PORTER: This case was continued from the regular hearing last month, and when we called the case last month, we called for appearances. At this time I am going to ask the attorney for the Commission to read those appearances, and when he has finished, then we would like to call for any additional appearances which may be made this morning.

MR. MORRIS: Appearances at the March hearing were entered by attorneys on behalf of Consolidated Oil and Gas Company, Southern Union Gas Company, R & G Drilling Company, Sunray Midcontinent Oil Company, The Ohio Oil Company, El Paso Natural Gas Company, Aztec Oil and Gas Company, Sunset International Oil Company, Pan American Petroleum Corporation, Caulkins Oil Company and Pubco Petroleum Company.

Appearances were also entered by company representatives for Atlantic Refining Company, Tidewater Oil, Texaco Inc., and Pioneer Production Company.

The Commission has also received letters and correspondence stating positions on behalf of the Beard Oil Company, Bruce Anderson, Frontier Refining Company, Amerada Petroleum Corporation,



Kay Kimbell, and British-American Producing Company.

MR. PORTER: Is there anyone here this morning who hasn't entered an appearance in the case?

MR. BRATTON: Howard Bratton for Humble Oil and Refining Company.

MR. WENDELL: R. C. Wendell, Delhi-Taylor Oil Corporation.

MR. FARLEY: P. J. Farley, Compass Exploration.

MR. LACEY: J. J. Lacey, attorney for Tenneco Oil Company.

MR. SELINGER: George W. Selinger, Skelly Oil Company.

MR. JETER: R. C. Jeter for Western Natural.

MR. PORTER: I would like to get some indication how many are going to put on testimony. First, I would like to call on those who intend to put on testimony favoring the application. I assume first would be Consolidated?

MR. STOCKMAR: Yes, sir.

MR. KELLAHIN: We have one witness at the present on behalf of Southern Union Gas Company, and, if the Commission please, we are expecting Mr. Al Wiedekehr to arrive later and we would like to put him on when he does arrive. We will renew that motion after we complete our witness, however,

MR. PORTER: Does anyone else intend to put on



testimony favoring the application? I'll now ask for those who intend to put on testimony opposing the application.

MR. KELEHER: If the Commission please, Pubco Petroleum Corporation has two witnesses and some exhibits.

MR. HOWELL: If the Commission please, El Paso Natural Gas Company. We will have one witness.

MR. SWANSON: Aztec Oil and Gas Company will have one witness.

MR. SETH: Sunset International will have a witness.

MR. HOLLAND: Caulkins Oil Company will have a witness.

MR. PORTER: Mr. Kellahin, how many witnesses did you say you would have for Consolidated?

MR. KELLAHIN: Southern Union there will be two; Consolidated there will be one. I have associated with me Mr. Ted Stockmar, a member of the Colorado Bar, who will present the case for Consolidated.

MR. PORTER: Mr. Stockmar.

MR. STOCKMAR: Gentlemen, I would like to ask leave to again make a few opening remarks. The remarks last time seem to have been diverted into a discussion over the continuation, and I would like to set the stage a little for our testimony here. The existing Order, Rule 9 (C) of No. R-1670-C provides for an allocation of allowables from the Basin-Dakota Gas Pool on the



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basis of 25% acreage and 75% deliverability. The applicant's proposed formula would amend this rule for this Basin-Dakota Pool only so that the acreage weight would be 60% and the deliverability weight, 40%.

In deciding upon this very important issue, we feel that there are two major points that the Commission should keep in mind, and toward which we will direct our testimony. These are, first, that it is our sincere conviction that the existing order is detrimental to the development of the Basin-Dakota Gas Pool, and as such it is detrimental to the State of New Mexico and detrimental to its people. Secondly, we are convinced that the existing order deprives some of the operators of the protection of their correlative rights and of the right to produce their own gas, their own reserves, all for the benefit of certain other operators.

We hardly need state that on either count the time is right for a review and a change. Let us first examine my statement that the existing order is detrimental to the development of the pool. We submit that the record will show that in terms of what this Commission has found to be the Basin-Dakota Pool, the common source of supply, that the existing development of spacing units involves a development of approximately 10% of the reservoir.

We submit that the record will also show that the rate of

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drilling of new wells in the reservoir has slowed down almost to a walk. It is our position, and we believe that we can show that almost 60% of those existing wells are, under this order, economic failures.

Now, the time has come to find out why this situation can exist. Is it the lack of producible reserves in place? We submit that the answer is no. Is it the lack of the capacity of the wells to produce enough to yield an economic return? We submit that the answer is no. Is it the lack of a market? We all agree that an even larger market would be beneficial to the operators and to the State, but even under the existing market it is not the small market that creates this problem. Lastly, is it the economic results of operations under the existing order? We submit that the answer to that is yes, and that it should be amended.

It gives me considerable pause, and no doubt it does you also, to consider the awesome power that you gentlemen have in this situation and the awesome response in connection with it. Consider that by a simple amendment of this existing order that you can convert hundreds of existing wells from economic failures to economic successes. In matters of this kind it's always helpful to me to walk around on the other side of it and get a different perspective. What we have here to look at is a relatively new



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field. Even though it is overlain by Pictured Cliffs, Mesaverde production, it is a separate and distinct reservoir, just as distinct as if it had been discovered in the southwest corner of the state somewhere.

With the new pool we do have a new order, but there certainly is a great element in that order of a carryover from the shallower orders even though they are distinct and separate things. We have limited experience with the field. Considering all these things, it seems only fair that the existing order should be regarded as a temporary one to gain experience to observe its impact, and that when the time is ripe it should be changed.

Many months ago, eighteen months I think, you considered this problem to give this what I choose to regard as an interim order. At that time there was diverse evidence and testimony and you could have, with propriety, at that time granted an order the same as the applicant is now seeking, 60% acreage, 40% deliverability. Had you done it and had at this time El Paso Natural Gas and others come before you here asking for a change of that order to 75% deliverability, 25% acreage, you would then have had to consider that in granting such an order you would immediately convert hundreds of economic successes into economic failures.

I query whether you would have or should do such a thing, and yet here today we have the exact equivalent of that situation,



a continuance of the existing order is the same thing.

Now, a word or two about the second point, the abuse of correlative rights. We submit that the evidence will show, we certainly will attempt to show it, that this reservoir is more uniform than not, that it's a blanket sand, having more or less uniform characteristics throughout with some variations, but that no tract varies substantially from its neighbors and from other tracts in the field.

There is one characteristic where there is substantial variation. This is with respect to the permeability encountered in that well. This we believe to be due to the accidental penetration of a so-called tight spot, or maybe of a loose spot, if that's the appropriate term for high permeability, which high permeability may be due to the particular characteristics of the sand at that point or the penetration of some long-range fracture system. Either way, that well was rated as a high deliverability well, even though no one believes that the particular permeability of the sand has any bearing on the gas reserves in place in that land.

As we stated last time we were here, we have no quarrel with deliverability as a device for measuring relatively the capacity of the wells to produce under given situations. We disagree violently with the concept that deliverability measures



the reserves that can be produced from the spacing unit on which that well is located. We submit that there is no mathematical relationship between deliverability and reserves under a specific tract.

In preparation for this hearing we've studied this matter as best we can. We have looked in the text books, we have talked with engineers; we have done independent study; we can find no mathematical relationship between deliverability and reserves under a given tract, under a spacing unit, for example. It may be, and you have seen, and you no doubt will see again today, graphs and charts which show an apparent relationship between the deliverability and reserves. These may have some bearing with respect to deliverability versus the reserves under some drainage area. We submit that that drainage area is not, is never fully the same as the spacing unit. Everyone knows that a well will not drain a precise 320-acre rectangle. There must be variations from that.

We submit that these comparisons of reserves versus deliverabilities that you have seen in the past and will see again today are no more than statistical gymnastics. It's easy to make comparisons between many things to show an apparent relationship even though none exists. A good statistician could show a good correlation between the annual production of oranges and the



annual production of apples, and yet there is no dependent relationship between those two. There may be a common cause, it may be the appetite of the people, but there is no relationship between those two.

Maybe a better analogy, or another one, a good statistician could show a good comparison between the consumption of beef every year and the production of cattle, if you will. You say, "oh, but there is relationship there." I say, "All right, let's look at the great nation of India where cattle are sacred. They are raised but they are not eaten." What happens to the statistician's theory then, it's out the window.

The point of this is that the apparent comparison depends entirely on the rules of the game. In India it's against the rules of the game to eat cattle. In our case the rules of the game are the orders of this Commission. Anyone working with figures which arise out of an order, which in itself relates deliverability and allowable production, it's a simple thing to show a relationship, it's there. Change the order, there's another relationship.

We urge that this Commission not be beguiled by these mathematical manipulations. It's much easier to show, and I think we can do it, that there is a clearcut relationship between surface acreage and reserves. At least, they have one major



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common factor, that's area.

Go back once more, we say that deliverability is not a measure of the reserves under a given spacing unit. If deliverability measures reserves in any way it can only measure the reserves in the drainage area contributing to that particular well. It does not measure the reserves that this Commission is charged with allocating fairly to the parties involved.

In this light, I think the comparison you can make between raw surface acreage and reserves seems to me to be more accurate when we're speaking of reserves under a given tract than to speak of deliverability under some unknown drainage area. With these two comparisons in mind, how can it be argued that our proposal of 60% acreage and 40% deliverability is anything but, anything more than a conservative minimum weighting of acreage?

At the last hearing I think the position of the opposition was summarized by Pubco in its opening statement. They basically want 100% deliverability. We submit that a 100% deliverability formula is nothing more than a chocolate-covered form of the rule of capture, the very thing that the New Mexico Conservation Act was enacted to prevent, the very thing which you gentlemen are charged with preventing. If there's a single title you can give this case, Perry Mason might, it's the rule of capture versus the protection of correlative rights.

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With that statement I would like to call Mr. Harry Trueblood as our first witness.

MR. KELEHER: In view of the fact that counsel for the applicant has stated his position and anticipated mathematical manipulations on the part of those objecting, may I repeat what was said briefly into the record?

MR. PORTER: You may proceed.

MR. KELEHER: I would like to state Pubco's position. We represent Pubco and object to the granting of the order prayed for on a number of grounds, including the following: The granting of the order in whole or in part will seriously affect Pubco in its operation, present and future, in the Basin-Dakota Gas Pool and will result in Pubco's abandonment in whole or in part of the drilling of scheduled wells for 1962. That Pubco respectfully objects and excepts to consideration by the Commission of any contemplated establishment of minimum and maximum allowables for such pool. That the proration formula presently in effect is a just and workable formula and gives each well its fair share of the existing market commensurate with the recoverable gas reserves of the individual wells.

That any refinement or change in the existing formula should be in favor of deliverability and a reduction in the acreage factor in that it is Pubco's position that well deliverability



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more truly reflects recoverable reserves.

That it is Pubco's position that an increase in the acreage factor at the expense of deliverability would in effect violate correlative rights and permit the weaker wells with less reserves to ultimately produce gas from the common source of supply in amounts in excess of their actual reserves.

That the existing formula provides a 25% acreage factor, which in effect allocates a basic allowable to all wells regardless of their deliverabilities merely because of their existence.

That it has been demonstrated that major changes occur within the Basin-Dakota Pool in porosity, permeability, connate water saturation, and sand thickness, all of which are the major and important factors in determining the actual recoverable reserves within a given Dakota drillsite. Pubco proposes to undertake to demonstrate the direct relationship between deliverability and recoverable reserves.

Pubco contends that if the Commission should consider any change in the proration formula, that such a change should be in favor of 100% deliverability.

Pubco objects to the introduction of minimum or maximum allowables in the field because such introduction would result in substantially changing the proration formula in favor of a straight acreage allocation of market and would be a violation of

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correlative rights.

That the applicant acquired the acreage complained of, and has drilled its wells with full knowledge of then and now existing Commission orders governing the field.

MR. PORTER: Mr. Stockmar, would you call your witness, please?

MR. STOCKMAR: Mr. Harry Trueblood. May I have all the witnesses sworn?

MR. PORTER: Just a minute, please. The attorney would like to swear all of the witnesses at the same time, or at least swear all of those who are present.

(Witnesses sworn.)

MR. STOCKMAR: May I proceed?

MR. PORTER: Yes.

HARRY A. TRUEBLOOD, JR.

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. STOCKMAR:

Q Mr. Trueblood, would you please state your full name and position for the record?

A My name is Harry A. Trueblood, Jr., I'm president of Consolidated Oil & Gas, Denver, Colorado.

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Q Would you state generally your qualifications as a petroleum engineering expert?

A I have a B. S. in petroleum engineering, University of Texas, 1948. I have at various times worked as an engineer for a major oil company in the capacity of production engineer, reservoir engineer and drilling engineer. I have acted as a chief engineer for an independent operator in the Rocky Mountain area, in the job as a consultant and supervising the drilling and completion of wells for a period of two years prior to the formation of the present company. I have supervised the actual drilling, equipping, completing of some of the first Basin-Dakota Field wells in the San Juan Basin prior to any order, incidentally, by the Commission. I have subsequently supervised personnel working under me in the actual drilling, development and producing operations of the Basin-Dakota Field, and at this time Consolidated Oil & Gas owns an interest in and/or operates approximately 10% of the wells in the Basin-Dakota Field.

MR. STOCKMAR: I ask that the witness's qualifications as an expert be accepted by the Commission.

MR. PORTER: They will be accepted, yes, sir.

Q (By Mr. Stockmar) Mr. Trueblood, first, in your capacity as a member of management or as an executive, would you refer to my statement that the existing order is detrimental



to the development of the field and give us your opinion in that connection?

A Gentlemen, it will be said to the contrary, I'm sure, in a few moments, but our primary concern at this hearing is one concerning the future development of the Basin-Dakota Field. We're already where we are. If the formula is allowed to continue as it now exists where it causes wells having less than a million cubic feet deliverability to be declared economically unsound, there is no other way for any management, I submit, to go from an economical standpoint but away from the development or further development of the Basin-Dakota Field.

Now, the number of a million cubic feet a day deliverability being uneconomic may come as a shock, but we intend to show this is the case. Certainly in looking forward past today we're already hung with what we have and, once again, as opposed to what the counsel for Fubco stated, most of our wells were drilled in the early stages and most of our wells in the earlier stages represented a tremendous proportion of the Basin-Dakota wells then drilled.

As a matter of fact, it's only been one year since we have had this formula in operation as an allowable formula, and during that period of time we have only drilled approximately twenty wells of all kinds.



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Our secondary concern, however, is this: As I stated, we have to live with what we have, if we can't get this new formula we're asking for, but we submit, and I submit as management, that where a well becomes an economic failure not due to its own characteristic but by the formula itself, that it's an improper formula.

It will be stated that a 500,000 cubic foot deliverability well never will pay out anyway, never will produce its reserves. I submit that a 500,000 cubic feet well allowed to produce will produce its reserves in twenty years, would pay out in five years. Now, that may or may not be an economic success in the opinion of persons in opposition to this particular request, but it certainly is never going to pay out, it's going to be an 80-year depletion type situation under the existing formula, and it's going to be a 20-year payout. I submit that what we're now living with is a situation whereby the formula permits payouts to vary by 20 to 1 in variation when the outside limits, the extreme freaks of reservoir parameters don't vary by more than 3 to 1, and that the average of the below and above average deliverability wells varies by less than 50%.

Now, we intend to show that even by El Paso's exhibit which was produced to the Commission, on which it based its order, that the variation of the average was only 60% and yet the Commission

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by its orders is allowing payouts on the order of 20 to 1. This is a ridiculous situation. We have not come here asking the Commission for something strictly out of a gain economically for Consolidated Oil and Gas, and this, once again, will be disputed, but I submit that the average deliverability of Consolidated Oil & Gas wells in which it owns interest is 1590 mcf/d which is above the average; but we are not concerned with that situation.

We're trying to look past the end of our nose. We would like to participate in New Mexico. We would like to continue participating, we've spent \$8,000,000 for ourselves and other associates in the last four or five years. We would like to continue developing. We cannot do it under the existing formula. It's impossible. We have no protection whatsoever against a well being declared an economic failure even though it could pay out in three or four years if it were a million cubic foot deliverability well.

Let's take a look at what's really happened in New Mexico, and principally because of the San Juan Basin and its allowable formula. Last year, and these statistics are taken from the Oil and Gas Journal, the date on it is March 26, 1962, their source of information was from the American Gas Association and the API. I think this causes pause for all of us to look at the San Juan Basin even more closely. New Mexico led all states, all states



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in decreases to crude reserves in 1961, almost 850 billion cubic feet of negative proved reserves as opposed to gains in most other states. In fact, New Mexico more than equaled the other negative numbers of all other states which showed a decline in proved reserves.

MR. EVERETT: May I interrupt? Did you write the article?

A No, I did not.

MR. EVERETT: Is the author to be available for cross examination?

A It is a compilation of statistics which are available for examination.

MR. EVERETT: I object to any further testimony on this line.

MR. STOCKMAR: I would like to ask that the Commission recognize this publication and the article in it, that it take administrative notice or judicial notice of it, and that Mr. Trueblood be permitted to proceed with respect to it.

MR. KELEHER: For the purpose of the record, Pubco also objects on the ground it's hearsay, irrelevant, immaterial, the author of the article is not here, not available for cross examination.

MR. PORTER: Objection overruled.

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MR. KELEHER: Exception.

MR. STOCKMAR: Please proceed, Mr. Trueblood.

MR. EVERETT: Are we to understand that we are given an automatic exception to the Commission's ruling so that each time we don't have to note our exception?

MR. PORTER: That's right.

A To review, New Mexico more than equaled negative-wise all the other states shown in the negative situation, and yet even with the negative numbers thrown in, the United States as a whole had the largest net gain it's had since 1959. Our opinion, as management, my opinion as management, is that this is due primarily to the fact that we've all been participating in an underground storage project in the San Juan Basin for the benefit of El Paso Natural Gas.

MR. HOWELL: If the Commission please, I have not objected to this witness getting up and arguing his case, but I do object to insinuations and to accusations made without any basis of fact, and I submit that this witness' testimony to the present time has been primarily an argument, and I do object to such statements being brought in here.

MR. PORTER: The Commission rules that the reference to El Paso be stricken from the record and at this time I would like to caution the witness to be less argumentative, please.

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Q (By Mr. Stockmar) Mr. Trueblood, the Commission has ruled that we should proceed more in the line of direct testimony. Do you have an opinion with respect to whether or not the non-development of the Basin-Dakota pool will result either in waste or in the abuse of correlative rights?

MR. EVERETT: I object, Your Honor, so far as the record is concerned, he's asking for a conclusion of the witness, yet there's nothing in the record to show that there's any non-development in the pool. I object on the basis that it's not a proper question because there's no evidence in here that there is development or non-development.

MR. STOCKMAR: If I may reframe the question.

Q (By Mr. Stockmar) Mr. Trueblood, if the Basin-Dakota Pool is not more fully developed than it is at this time --

MR. KELEHER: I would like to object to that on the ground that it's the contingency that's not in the record at all, no proper foundation has been laid.

MR. PORTER: Mr. Stockmar, is it your intention to establish by testimony that there has been a decrease in development?

MR. STOCKMAR: Yes, this Commission has determined that a particular area is the Basin-Dakota Pool, that it is underlain with a common source of supply, it's own records will show



that only certain spacing units have been developed to this time. It seems to me that that is an adequate foundation for a conclusion by this witness. We could have brought forward testimony. I thought it simpler to simply make the statement myself, as supported by your own findings and record. We can come back to this point later after Mr. Trueblood has testified as a petroleum engineer, if you wish.

MR. PORTER: Suppose we proceed on that basis, Mr. Stockmar.

Q (By Mr. Stockmar) Mr. Trueblood, in your capacity as an expert, will you briefly describe the Basin-Dakota Pool?

A Without boring the Commission in general, and repeating what has been said many many times, basically the Basin-Dakota Pool is a common source of supply. It's a fairly massive continuous sandstone with local variation in permeability, local variation in porosity and local variation in water saturations, but it's widespread, it's fairly uniform on the overall picture.

It has low permeability, and, therefore, low rates of production compared with the gas in place. However, it is an extremely large reservoir with communication, and the long life of the field will permit redistribution of the gas in the reservoir if disproportionate withdrawals are made.

It is essential that the allowable formula protect correlat-



ive rights. We agree that there are localized changes in character, but on the whole, no matter what the change in character could be, the wide variation of the characteristics or the reservoir parameters making up the Basin-Dakota Field does not vary over one to three at the extreme and not over 50% on the average of the above and below average low deliverability wells.

You can find extreme cases where you have extremely high permeabilities, extremely high deliverabilities and thin sand sections whereby the reserves in this instance would be very small unless the drainage radius was much larger than 320 acres, which has been decreed by the Commission as the proper spacing unit for the Basin-Dakota Pool. We have no argument with the spacing in itself or the 320-acre spacing as the best balance in economics and the ultimate recovery. We do submit that spacing in itself does not protect correlative rights. It only prevents drilling of unnecessary wells.

Now, the economic atmosphere is all important in this consideration, and although the Commission is primarily concerned with correlative rights, it should concern itself with the thing that has been brought up many times, that there's nothing wrong with the good old American way of making a profit if you have a profitable well. For the existing allowable or allocation formula to cause uneconomic wells which could be economic, we submit



is improper.

Q Mr. Trueblood, is it your opinion that the Basin-Dakota Pool is fully developed at this time or less than fully developed?

A It is considerably less than fully developed. As a matter of fact, it appears that based on the Commission's finding as to the limits of the Basin-Dakota Field, it is less than 10% or approximately 10% developed at this time.

Q If the field is not fully developed, would this, in your opinion, result in waste or the abuse of correlative rights?

A The loss, or the leaving of hydrocarbons in the ground undeveloped and untapped that are producible hydrocarbons is waste. By the same token, to allow hydrocarbons from under a 320-acre tract that is not developed to be produced through an adjoining 320-acre tract which is, strictly because the allowable formula would not permit the development of that 320-acre tract, is an obvious abuse of correlative rights.

Q Although it may be quite clear to the Commission, based on your prior statements, would you again state your opinion as to the propriety of the existing formula in terms of the weight given to deliverability?

A This weight given to deliverability has caused a deliverability raise. It's causing the operators to put a maximum incentive on large fracture treatments which may or may not



necessarily be needed to drain the specific 320-acre tract, or to attain the recoverable gas from under its 320-acre tract.

Operators are almost compelled by this to utilize in some instances unnecessary extra fracture treatments. Operators are prevented, if they happen to be unlucky enough to have a well that did not penetrate a particular fracture system which may be somewhere else on its 320-acre tract, of never being able to produce the gas under the existing formula because of the weight.

MR. STOCKMAR: Gentlemen, at this point we had hoped to have a blackboard available so that Mr. Trueblood could demonstrate something. In its absence we have prepared a sketch that might do as well.

Q (By Mr. Stockmar) Mr. Trueblood, so the record may be complete, would you explain what is there and explain for the record any marks which you make upon it?

MR. PORTER: Before we start into this exhibit we will take a five or ten-minute break.

(Whereupon, a recess was taken.)

MR. PORTER: The hearing will come to order, please. Mr. Stockmar, you may proceed with your witness.

Q (By Mr. Stockmar) Mr. Trueblood, before the intermission you had been giving some testimony with respect to correlative rights and so forth. Would you proceed to amplify



that testimony near the drawing up there?

A Before proceeding I would like to issue my apologies to Mr. Howell for mentioning anybody's name. I did get carried away, and as far as that goes he's a partner of mine and a stockholder.

We have been bandying this correlative rights situation around loosely now for about thirty minutes and I think it would be well to examine what we are talking about in as simple terms as possible.

What is correlative rights? We had hoped to have the use of a blackboard here, and this, as you can see, is not a very artistic exhibit. We didn't intend it as an exhibit. We would like to examine correlative rights if we may, for a minute, and we have here a surface square mile area in which there are located two 320-acre drillsite units as declared as drillsite units by the New Mexico Oil and Gas Conservation Commission.

If I may for a minute, we have given this depth so as to give it a little perspective with respect to sand thickness, and that sort of thing, and if I may for a minute assume that each one of these sides of this square mile has four and a half billion cubic feet of gas identical. We have put an invisible shield, if you may, between these two 320-acre tracts. We have sunk an orifice which has an opening of the size of 800,000 cubic feet per day in this side. We have sunk an orifice, if we may, which



has 2,000,000 cubic feet per day on this side. The invisible shield remaining and allowed to produce uncontrolled, this particular well, without any formula, would produce all of its gas in less than fifteen years. This well would produce all of its gas in seven or eight years.

If we may, for a minute, however, put a 25% acreage and 75% deliverability on each side, when this well has exhausted itself--

Q Mr. Trueblood, for the record, would you identify which well you are referring to?

A When the 2,000,000 cubic foot well has completely exhausted itself under the existing formula, 50% of this volume will still be left. Under the reverse of 75% acreage and 25% deliverability, 20% will be left.

Now, obviously this isn't what happens. By the use of gardol or what have you, we remove the invisible shield, what happens? There must be flow from the 800,000 cubic foot well to the 2,000,000 cubic foot well, and that's as simple an interpretation of correlative rights as I can possibly make it. With this in mind, what we're asking for, mind you, is a 60-40; a 60-40 would leave something like this and still create drainage.

The next question arises, why didn't we ask for 85-15? Frankly, we didn't have the guts to ask for it. We felt that we would be so opposed even at 60-40 in the change that at least



we felt that this was a moving in the right direction, and that the Commission could review it for a period of eighteen months similar to what it's reviewed to date, and perhaps it should be 85-15. Now, we submit that this same square mile in depth occurs over and over and over again throughout the entire Basin-Dakota Field.

Q Do you have a specific example of this, Mr. Trueblood?

A Yes, I do, if you will bring up Exhibit 1 for a minute.

Q First, Mr. Trueblood, would you identify the drawing there?

A This drawing is a drawing of just this type of situation of two offset wells immediately adjacent to one another. One of them is the Consolidated Oil & Gas Government Gross No. 1-7, one of them is the Consolidated Oil & Gas Government Leeds No. 1-8.

Q Was this prepared by you or under your supervision?

A It was prepared under my supervision. Now, we submit that basically from log interpretation, and we have had it investigated by others and ourselves, and our own interpretation, that these are almost identical wells in sand thickness, pore count, water saturation, et cetera. There are local little variations, but for the most part they are almost identical.

Once again, going back to this drawing, the question



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is which one gets drained first? Which twin has the Toni? We've submitted to others, been guesses on both sides as to which one is going to produce the gas. This is the problem that every San Juan Basin operator is faced with every time he drills a well. Which one is going to be a non-commercial well under the existing formula and which one is going to be the commercial well? I submit which one is going to be the commercial well. We can all hazard a guess, and I would like for you to all hazard a guess and then we will take a look at it.

This well in February had an allowable of 10,000,000 and deliverability of 709. This well, the Government Leeds well, had a deliverability of 1387, and an allowable of almost 16,000,000 cubic feet. It is obvious that under the existing formula that there can only be drainage from this to this; with differences in ownership of the existing working interest, there is no protection of correlative rights. None whatsoever. And yet this is repeated time and time again, you can look at 20,000,000 cubic foot deliverability offset by 500,000 cubic foot deliverability wells in various parts of the Basin. This is not peculiar to one area. There are areas of somewhat higher permeability, somewhat higher porosity, we call them the sweet spot of the Basin-Dakota Field, which we are fortunate enough to have a participating interest in, but even in the sweet spot these same variations



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between 320-acre tracts exist. This thing could just as well have been 2,000,000 cubic feet and 6,000,000 cubic feet, just as well. If we may move on to our Exhibit No. 2.

MR. STOCKMAR: Excuse me, Mr. Trueblood. We would like to have this paper marked and accepted as Exhibit No. 1.

MR. PORTER: The exhibit will be marked at this time and then you can offer all the exhibits at the same time.

(Whereupon, Applicant's Exhibit 1 was marked for identification.)

A May I have Exhibit 2 and 3, please?

(Whereupon, Applicant's Exhibits 2 and 3 were marked for identification.)

Q (By Mr. Stockmar) Would you identify and describe Exhibit 2 and the matters therein?

A Gentlemen, Exhibit 2 is an exhibit taken from the Basin-Dakota Gas Pool from the February, 1962 proration schedule.

Q Was this prepared by you or under your supervision?

A It was prepared under my supervision. The number of participating wells in the pool at that time was 507. Of all the wells used, which were 473 on which we had available deliverability factors, and in a few instances there appeared to be typographical errors with relation to allowables versus the deliverability factor, so we threw them out; in any event we used a total of 473 wells as participating wells, which is a substantial percentage

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of the 507 participating.

These wells had an average deliverability of 1404 MCFD. The total deliverability for the 473 wells was 664,031 MCFD. The average allowable per well for the 473 wells was 16,039 MCFD; the total allowable of all wells, the 473 wells, was approximately, incidentally, the D shouldn't be on this last item, 7,586,552 MCF.

Now, moving on to Exhibit 3, we have broken down these wells into their ranges of deliverability, and we find that the deliverability range of 0 to 1,000 MCFD was represented by 58.8% of the wells, and those below 2,000,000 totaled almost slightly over 80% of the wells in the field. Then we had the freaks from there, 0 to 20 percenters, and it would be well to note at this point that the over 6,000,000 cubic feet per day deliverability wells had 12 times the allowable of a well of the group from 0 to 1,000. In other words, these ten freaks get approximately 120 wells' equivalent allowable of the below 1,000,000 deliverability class.

For this to be equitable and protect correlative rights, these wells would have to have 12 times the reserves of a well with a million cubic feet or less deliverability. It is our very firm opinion that no such relationship exists.

Now, reviewing this particular item, we attempted to find a proper formula; as before stated, it appeared to us that it

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should be 75% acreage and 25% deliverability, but because of the controversial nature, we determined to submit our application for 60% acreage and 40% deliverability.

Now, a study of the entire Basin-Dakota Field in magnitude is far beyond the scope of our limited facilities. We do have an independent consultant analysis of our own properties, but it was not broad enough; we did find, however, on our own properties that we had approximately 63% below average deliverabilities and 37% above. We also found that the average variation in the average below and the average above deliverability wells was less than 50% in reserves, and that the extremes from the extremely high to the extremely low variation was certainly less than 3 to 1. We next, after considering a fieldwide reserve and lacking the staff, we next went to the, what we considered, or what the Commission had considered proper and very good engineering work in presentation by engineers of El Paso Natural in its first allowable formula hearing, and this was presented in Case No. 2095 in January, 1961.

Now, if I may have that -- this is not our exhibit. This is just reintroducing what El Paso had introduced, and apparently what the Commission had acted upon.

MR. STOCKMAR: I would like to further explain that this is a blown up picture of an exhibit previously entered with



respect to this field.

Q First, Mr. Trueblood, it's my understanding that the small numbers appearing beside the circles were not on the original exhibit, but that they were adduced by testimony at the time, is this your understanding?

A This is my understanding.

MR. STOCKMAR: We have additional small copies of this.

Q Will you proceed, Mr. Trueblood, and first possibly explain why you are again bringing forth this work of theirs?

A Once again, I reiterate that information on the Basin-Dakota Field as such, published information is sparse, work of any magnitude on reserves versus deliverability, even though we don't subscribe to that concept, work of this nature is fairly hard to come by, and since the Commission based its original order using this as a guidepost, or one of its guideposts, we determined to take a look at El Paso's work.

This chart represents a case study of 160 wells. We presume that it was done under engineering supervision of one or more people, but being done by the same people would substantially relate itself to work within their own ideas of deliverability versus reserves. Now, once again I reiterate that we do not subscribe that there's a direct relationship between deliverability and reserves in place. There may be some relationship



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in the lower ranges of deliverability because obviously you have to have some permeability or you can't produce any reserve. We do not subscribe, however, that that particular point, given time to produce, and disregarding anything else but time to produce, that even a 300,000 or 250,000 cubic foot well could eventually produce its reserves.

Let's take a look at a 250,000 cubic foot well. In El Paso's instance, on a deliverability of that type they had something less than a billion cubic feet of gas reserves; 250,000 a day would still only take ten to twelve years to deplete, and undoubtedly a well of that low magnitude wouldn't be getting somebody else's gas if it were allowed to produce. But the most important thing about this particular chart is, getting back to our average concept, average, average, knock out the freaks, the three on one end and the one that obviously is never going to be produced under the existing formula, we had no way of knowing where the individual deliverability points might be in each of these wells, the twenty-two wells up and down the scale, but we were able to establish that the average reserve from this chart, weighted average reserve was 3.6 billion cubic feet of gas.

Now, this case study of 160 wells was taken from 214 wells in the September proration schedule. We have no idea what 160 wells they utilized of the 212 available, but we do know that

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the average deliverability in September of 1960 at the time they studied it, was approximately 1225, which happens to relatively agree with their 3.6 billion cubic feet of gas.

Now, we then discovered that on this chart, as developed, that approximately 66% of the wells, no, pardon me, 69.6%, as best we could tell, had below average deliverability, and once again we don't know the range in each specific point, but that it appeared eyeballing that approximately 70% of the wells fell in a range below this average deliverability and 30% fell in the range above the average deliverability.

How did this relate to the field today, February, we felt that this would be important to see if this case study done very early in the field's history would be representative of the day's work. Where do we stand today? Is this any good or should we throw it out? We found that in February of this year that 66% of the wells fell in an average under 1404, if you'll refer again to Exhibit 3, excuse me, 69.6% of the wells on Exhibit 3 fell in the below 1404, and 30.4 fell above. So we were amazed to find the work done this early in the stage of the game is so accurate of the field today. We were quite amazed, as a matter of fact, but we hope that we enjoy the amazement because the one thing we did establish is that the wells, if that is true today, that this 70-30 concept still exists, we found that on this chart the

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average weighted reserves of the below average deliverability wells was 3,000,000,000, that the average reserve of the above average deliverability wells was 5,000,000,000.

We submit that this is the range existing in the field today. In other words, there's only a 60% variation in reserves on this average concept, throwing out these freaks, and, therefore, in order to protect correlative rights you must stay in this range or there will be cross drainage. There is no question about it.

Now, what does it take to stay in that range? We investigated that it takes 75% acreage and 25% deliverability factor to stay in this range. Exactly 180 degrees difference than we now exist today. This, we think, is the most important thing that must be brought to this Commission's attention. One, that we have a situation here where, back to Exhibit 3 again, we have wells getting 12 times the allowable, 12 times, and yet the variation on the average even by El Paso's work is only 60%. We submit that there's no equity involved in this. There can't be equity. There can't be a protection of correlative rights.

Now, we would like at this time to get back to Consolidated's basic point, we do not believe basically that given time that any well, and we'll say from 250,000 cubic feet or 300,000 cubic feet, given time and given a proper formula, that it can produce its



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reserves; only if it's given the formula can it produce its reserves, and yet today on the payout situation all wells having a million cubic feet a day or less are anywhere from 10 to 25 or 30 years in payout. Using 6% present worth, anything that pays out in 12 years, you have gotten nowhere. In other words, the formula itself is creating this economic inequity, the basic formula.

Now, we all would like a bigger piece of pie. We would love to have a tremendous piece of pie and we hope that the transmission companies will be able to get this bigger piece of pie. Even if it is bigger, which would encourage development -- even if it is bigger, we still couldn't protect ourselves on the relative rights problem no matter how big the pie is. We have to have our piece. This is the Commission's duty that we get our piece of pie. Everyone will say that Consolidated is here for its own economic consideration. I reiterate that basically our overall average allowable of all the wells in which we have an interest is above the field average. We are interested in staying in the San Juan Basin and we are interested in further development of the San Juan Basin, and we are interested in bringing this negative gas, proven gas reserves position back the other way. But we can't do it under the existing formula, and no management person can ever purposely continue to drill wells that are delcared



uneconomic in advance.

Now, what does this say? This says that 70% of the wells, excuse me, 60% of the wells, 58.8 are by Commission ruling, and under the original order, are uneconomic by administrative order. This can be corrected. We would at least like to have a correction for the same period of time of eighteen months that we have been living, or fourteen or fifteen months that we have been living under this uneconomic situation to study it. During this period of time additional reservoir information will be available. The Commission will probably want to take it under review fourteen or fifteen months down the line. We submit that they'll want to move it higher acreagewise.

Q To forestall the comment that you are again becoming argumentative, I would like to move on to Exhibit 4, if you will.

A All right.

Q Mr. Trueblood, would you just identify and explain this exhibit?

A Once again, tying back to the El Paso work of the 70-30 relationship as it apparently is still in existence today, in our examination of the above and below average deliverability wells in February of this year, Exhibit 4 once again repeats that of the 473 field wells represented, approximately 69.6% of the wells in the field had below average deliverability, and those



above average deliverability remained 30.4.

Going back to El Paso's average once again of three and five relationship, using three billion per well for the average of the below average deliverability wells, and five billion for the average again of the above average deliverability wells, we find that the below average deliverability wells had 62% of the field reserves in the Basin-Dakota Field, and that these high deliverability wells had only 37.7.

Now, where were they, however, in the February field allowable? 329 of the wells, or, once again, this 69% had only 38.8% of the allowable. On the other hand, 144 wells had 61.2% of the allowable. What can that possibly mean? It can mean only one thing, drainage.

Now, the February, 1962 average per well allowable of the 25-75 was 8.9 million cubic feet, and of the above average wells there was a 32.3 million cubic foot allowable under the existing formula. Under our proposed formula this 69.6% of the wells would be getting an average of 12.2 million cubic feet for that month as opposed to 24. We have still granted, even under this request, drainage, but at least, once again, if we are participating in underground storage projects we can cut out some of the lease.

Q Mr. Trueblood, would you again state how great a deviation in the reservoir characteristics is necessary to justify



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a say two to one difference in reserves?

A The reservoir characteristics per se obviously would have to have a 200% difference in sand thickness or porosity or water saturation exclusive of permeability in order to change the in place reserves. We submit that this is not the case, and even by El Paso's work there's only a 50% difference on the average.

Q Mr. Trueblood, will you specifically state your opinion with respect to whether or not the proposed 60% acreage, 40% deliverability formula will better prevent waste and protect correlative rights than the existing formula?

A It is my firm opinion that, as demonstrated through these exhibits, that it is not a cure-all, but it is at least a step in the right direction; and failure to take that step, in my opinion, will discourage further exploration and development of new reserves, will discourage possible new market outlets from being sought because the only way that market outlets are created is through pressure to create them of having cappable gas at a shutin capacity.

It is my further conviction that it will deprive the people of New Mexico of the needed taxes by the lack of expenditure for further development in the field under the existing order; and furthermore, we feel that it unduly penalizes those operators who

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have already come down here, already been here, have adopted New Mexico as a place to spend money and like to stay.

If we can't be given some kind of encouragement by you in the face of the fact that 70% of the wells that are being drilled are committed to economic failures before they're being drilled, this has got to go the other way, we can't spend the money here. There's no way. And yet we would be willing to, if we felt that we were being protected correlative rights wise, where if we happened to get a well less than one million deliverability or so, that we might at least some day see a payout.

Q Mr. Trueblood, were all four of the exhibits which have been presented been prepared by you or under your supervision?

A They were all prepared under my supervision.

Q Will you refer to Exhibit 2 for a minute? I believe a typographical error has crept in there. I call your attention to the parenthetical statement which appears twice, "For distribution of deliverability, see Exhibit 2". Should not this be corrected to read "Exhibit 3"?

A Yes, it should.

Q The last exhibit with respect to which you testified, we would like marked and identified as Exhibit 4, and with that we would like these four exhibits accepted.



(Whereupon, Applicant's Exhibit 4 was marked for identification.)

MR. PORTER: The record will show that Exhibit 4 has been marked. Does anyone have any objection to the introduction of these exhibits? The exhibits will be admitted into the record.

MR. STOCKMAR: I would like to submit the witness for cross examination or questioning by the Commission.

MR. PORTER: Any questions of the witness? Mr. Keleher.

CROSS EXAMINATION

BY MR. KELEHER:

Q Mr. Trueblood, one statement on direct examination, it is my recollection that you said that 60% of existing wells in the Basin-Dakota were economic failures?

A That is correct.

Q And in other parts of your testimony you said that 70% of the wells are committed to economic failure?

A Well, I'm very sorry if I said 70 in the second instance, it is 58.8% pursuant to Exhibit 3.

Q When did Consolidated acquire the acreage on which you have drilled?

A Mr. Keleher, we have been acquiring acreage in the San Juan Basin periodically since 1956.

Q How long have you been with Consolidated?

A Since its foundation, January 1st, 1955.



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Q Have you directed drilling of the wells on the leases that you acquired since 1956?

A They have been under my supervision directly or through other members of my staff.

Q How many wells have you drilled on the leases that you acquired since 1956?

A Of all types of wells, Mr. Keleher, or Basin-Dakota wells?

Q Yes, and Basin-Dakota wells.

A We have drilled or participated in with other operators approximately 60 wells.

Q You say that that's 10% of the wells drilled in the Dakota?

A Approximately. I believe actually the correct number is 57 through February which ties in to the type of Dakota we have actually presented here.

Q Can you give us the names of some of those who are participating with you in the drilling of these 60 wells in the Dakota?

A Well, actually, this happens to be a matter of public record, but of personal concern of mine, that it is not common practice to distribute names of drilling participants for obvious reasons of competition for looking for tax dollars when you are raising money from drilling participants. There are some

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twenty-five or thirty people.

Q There are some twenty-five or thirty participants?

A Yes.

Q And you would prefer not to mention their names?

A That's correct. I don't mind mentioning El Paso Natural Gas or Southern Union that have been our partners where we have been the operators.

Q To what extent have your wells proved, during your administration proved economic failures?

A Well, exactly none of them were economic failures until February 1st of last year, Mr. Keleher.

Q Well, you've drilled a number of wells since then, have you not?

A That is correct. Most of which are just being put onto the pipeline due to the necessary delays that seem to go on with the pipeline companies, but we do have some production history on the wells drilled last year, a very limited amount.

Q When you became a chief administrator of the Consolidated you were aware of the prorating rules that were in effect here by the Commission?

A Prorating rules for the Basin-Dakota formation?

Q Yes.

A There were no prorating rules for the Basin-Dakota



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formation.

Q Well, you have been familiar with it ever since the rule was established?

A Since February 1st of last year, yes.

Q What you want this Commission to do is to give you your piece of the pie, as you described it?

A That is exactly correct.

Q You believe that you are not getting enough pie at this time?

A Actually, I'm getting more than my share, Mr. Keleher.

Q Are you here representing Consolidated or representing other operators?

A I am here representing Consolidated and in the interest of conservation and correlative rights.

Q You believe that under this present formula you are getting more than your share of the pie?

A That is correct.

Q Then aren't you a trifle inconsistent in saying that you are getting your share but you want, as you describe it, a piece of pie that belongs to you?

A I want all wells that are possible economic wells to be--

Q Failures?

A -- to be placed in that category. I believe that's as

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I presented it. I don't necessarily ascribe to two-year payout when economic wells could be six or seven that are now fifteen.

Q You want all wells placed on a par regardless of location?

A Beg pardon? No, not regardless of location, strictly on reserves, Mr. Keleher.

MR. KELEHER: I have no further questions.

MR. PORTER: Does anyone else have a question of the witness? Mr. Everett.

MR. EVERETT: W. H. Everett, Ohio Oil Company.

BY MR. EVERETT:

Q Mr. Trueblood, in stating your qualifications, I think you stated that you had a Bachelor of Science degree in petroleum engineering from the University of Texas in 1948?

A That is correct.

Q You also stated that you had worked for some oil companies in the capacity of petroleum engineer?

A That is correct.

Q And that you had acted as a consultant in various capacities either for an independent operator or on a consulting basis?

A That is correct.

Q I wonder if you could give us a little more of the

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background of your present company and your affiliation with it from the standpoint of when you started the first company, whatever its name was, and so forth, that is now and I guess resulted in the name Consolidated Company, can you get into that for us a little bit?

A Well, now, if you want about thirty minutes I will go through the corporate issue.

Q I think that would be fine, it would be very interesting to me.

A All right. As a consulting petroleum engineer during the years 1953 to January 1st of 1955 I acted in the capacity as a consultant to certain individuals. I formed a company called Twin T Drilling & Producing Company. I didn't form it, I participated in a drilling rig venture, which was very catastrophic, which many of these ventures turn out to be. I reorganized the company, took it over and changed the name and borrowed some money and paid off the creditors and started as Consolidated Western January 1, 1955. We operated as Consolidated Western Exploration until April 30, 1958. During that time we participated in drilling ventures in the San Juan Basin. We came here in 1956 as Consolidated Western.

We took farmouts, drilled some of the earliest Basin-Dakota wells that were drilled in the field. Drilled probably ten or



twelve of the first forty wells that were drilled in the San Juan Basin. We had some modicum of success and at the time we were able to sell some gas. We determined that we were going to need a considerable amount of corporate money to continue our acquisition program of buying producing oil properties and drilling gas wells.

To try to sell a closed corporation of twelve stockholders, such as Consolidated Western Exploration, to the public in 1957 was an absolute stark impossibility on Wall Street. We became publicly held through merger with a company called Consolidated Rimrock Oil Corporation. Now, Consolidated Rimrock Oil Corporation has a rather lurid history and I won't get into the details, but it did take a tax loss and carried forward some tax props and eighteen irate stockholders, at least. By merging into them and reversing, splitting the stock, we were able to take over two-thirds' control of the company, and if nothing else we had sellers of the stock even if we didn't have any buyers, so this was how our market was created.

We subsequently replaced by paying \$150,000.00 in stock at two and a half dollars a share, which gave us a little equity money to move along. We subsequently went to our stockholders and raised \$400,000.00 in equity money in September, 1960.

In the meantime we had been continuing our drilling program

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in the San Juan Basin. We acquired additional oil and gas production in other states and by 1961, February, 1961, we purchased a company known as Midland Oil Company via the merger route, through a purchase of 40% of the stock prior to the merger, merging the companies and acquiring five hundred more stockholders in that manner.

Q Were they irate?

A Fortunately they weren't, because the stock immediately moved up from two and a quarter to an equivalent four dollars and a half, and if they were irate prior to that time they weren't afterwards.

By this time we had approximately 4,000 stockholders. We continued our operations in the San Juan Basin and acquisition of properties until February of this year, at which time we acquired a company known as the Tekoil Corporation, which was in fairly dire straits financially.

MR. PORTER: What was the name of the corporation?

A Tekoil. In so doing we acquired our opponents in this particular thing, the second largest stockholder in Consolidated Oil & Gas, namely El Paso Natural Gas Company.

MR. STOCKMAR: If the Commission please, I think this is very interesting, and aside from proving that Mr. Trueblood is an excellent manager and investor as well as an expert engineer, I



wonder if it is relevant to the procedure. I would like Mr. Everett to --

MR. EVERETT: I think it's very relevant. I am leading up to your annual reports which Mr. Trueblood has signed as president, and the area in which he wishes to deal as a matter of economics, I think it's very material as to what the financial base of the Consolidated Oil & Gas Company is.

MR. STOCKMAR: I still do not see the relevance of the company's financial report to the questions of waste and correlative rights that are under inspection by this Commission. I would like an adverse ruling on the part of the Commission to the continuation of this line of questioning.

Q (By Mr. Everett) I think you are up to the last one, Tekoil was the last one?

A No, no, I'm not through yet.

MR. EVERETT: I beg your pardon.

MR. STOCKMAR: Mr. Trueblood, the Commission is considering my motion.

MR. PORTER: Mr. Everett, would you tell us as simply as you can what you propose to show by this line of questioning?

MR. EVERETT: Yes, sir, I propose to show by this line of questioning the position in which Mr. Trueblood finds himself and his company as caused by the various Consolidated mergers,



consolidations, mergers, financing and other operations they have got into, which I think will prove rather conclusively to the Commission that there's nothing wrong with the formula, that the trouble is that Consolidated has put itself in the position where it's not even getting a portion of the income from the wells in which it has an interest. They're asking this Commission to bail them out of a situation which they created and not one which was created by any equities in the formula.

MR. STOCKMAR: If the Commission please, Mr. Trueblood's testimony has been directed to what he as an executive plans to do in the future with respect to drilling in the San Juan Basin. His testimony with respect to the economics of particular wells was based on each well as an individual problem, without respect to who owned interest in it, whether he borrowed money against it, or the financial position of his company. I again submit that this is a kind of red herring that has nothing to do with the issues before us today.

To the best of my knowledge Mr. Trueblood is entirely satisfied with the status of his company as it is now, its rate of growth, that is not the issue before us. I would earnestly like to have this particular pursuit abandoned.

MR. EVERETT: I ask you to change, that you change the red herring to red apple, I think it's the bad apple in your



barrel.

MR. PORTER: Objection sustained. Mr. Everett, would you pursue some other line of questioning?

Q (By Mr. Everett) Mr. Trueblood, you have stated in your direct examination that no management person can continue to drill wells which are declared uneconomic in advance. Who declares a well uneconomic in advance?

A I would say, based on my testimony, that we are already on notice on what is available today that a million cubic foot or less well is uneconomic and that if more wells are drilled they are declared uneconomic in advance, and this is the basis for my statement.

Q Did the Ohio Oil Company farm out some acreage to you, to your company, I think it was Consolidated Western at that time?

A That is correct.

Q Referred to in one of your exhibits as the Gross No. 1-7?

A Right.

Q And didn't the Ohio Oil Company declare to you in advance that it considered that location uneconomic for it to drill?

A That is correct, but the economics of the oil company and the economics of the drilling participants in higher tax brackets are two different things, Mr. Everett.



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Q What elements enter into whether or not an operation is economic?

A Well, I think the basic concept is a fair return on your investment.

Q Does the matter of salary of officers enter into it? Do you consider that a part of your operation?

A Certainly.

Q Your overhead is another item?

A That is correct.

Q The cost of leases?

A Not necessarily cost of leases, particular items of capital item, capital plant item.

Q Cost of drilling a well?

A Cost of drilling a well is, once again, a plant item.

Q Cost of casing? A Plant item.

Q By plant item, you mean you consider that an element of cost that enters into your determination as to whether drilling any particular well will be economic?

A That is correct.

Q Do you, in your company, have you arrived at any operations cost, let's say, on a per thousand cubic foot basis for your operations in the San Juan Basin?

A Depending strictly upon the rate of withdrawal in each



individual well, the percentage of the amount that you sell changes dramatically. In other words, it costs the same amount to operate a well that's only produced three days a month because of its restricted allowable and small volume as it does to produce a big volume well three days a month or four days a month and produce a big volume. I would say that the range of cost of operation will vary anywhere from 2% to 100% under the present formula.

Q Wouldn't it vary under any formula?

A It would vary under any formula, but the range will probably not be so great because the smaller volume wells would be producing larger volumes in any given month, which in turn would give a larger gross income in which to charge your operating expense.

Q To get back again to my basic question, what is Consolidated's cost figure per MCF of gas in the joint well they operate with Ohio, is it two cents?

A The cost figure?

Q Is it twenty-two cents, or what is it?

A The cost figure in the one we own jointly with Ohio?

Q Yes.

A We operate a Mesaverde well jointly with Ohio.

Q I'm speaking of the Dakota, you operate that and we have



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an override.

A That's right. That specific well, the operation cost is probably something on the order of 40% of the revenues that will be ultimately received, or the rate of revenues that will be received under the present formula.

Q 40% of what?

A Of the gross sales.

Q What dollar number is that?

A The gross sales in that specific well probably is on the order of, something on the order of 80 million cubic feet of gas for the year. I don't have those figures handy, and I wouldn't know exactly what it was, but in 1961, the gross sales in that specific well, which happens to be an average well, the below average deliverability well, it would be my guess that they're probably less than \$12,000.00 in total revenues received from that well.

Q Your cost of operating that well you think is approximately 40% of the total?

A It could be as high as 40%. I don't know if it would be in that specific well, but wells of that order.

Q Well, let's take the other one.

A This is considering depreciation on the equipment and what have you, into the cost of operation, as are all costs

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computed.

Q Well, now, let me ask you another question concerning, we can go back to the Gross or I can take any one of the three others that you operate.

A I prefer that you bring up the three others, they are nicer wells.

Q Well, let's take the Leeds well, you think that, from your testimony you apparently think that the Leeds well and the Gross well are exactly the same reservoirwise, is that your testimony?

A That is correct. That is exactly correct, reservoirwise.

Q Reservoirwise? A Right.

Q In drilling the wells, are you familiar with what was encountered in the drilling of those wells insofar as the productive section of the Dakota-Basin pay is concerned?

A Oh, I would say the overall gross thickness pay was on the order of 80 feet of sand. The net effective thickness was probably on the order of 55 to 60 feet.

Q In both wells? A Right.

Q Was that net pay contiguous in the sense that there were no intervening strata in one well and not in the other?

A I don't understand your question. Are you saying that the same indicated porosity in the same basic sand section is



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the same in each well?

Q No, I'm asking you for the net effective thickness of the pay.

A I stated, I believe, in my testimony that the net effective pay thickness was approximately the same in both wells, based on log interpretation.

Q Were those wells cored, did you have core analysis?

A We did not core them.

Q You did not core them. Did you find in the wells the Dakota pay, the net pay of 65 feet you say in the Leeds well, for example, was that net pay contiguous or was it in a number of streamers?

A It was in a number of individual sand sections, but basically two to three massive bodies of sand.

Q Was it the same in the Gross well?

A Basically.

Q What do you mean, basically?

A Well, I mean that there will be local lensing variations where one lens might be twelve feet thick in one and eight in another, and other lens vice versa, might be twelve and eight and so forth.

Q Now, to get back to the matter of economics again, as I understand your testimony, Consolidated does not own 100% of



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the working interest in any lease which you operate, is that correct?

A Well, not in any lease which we operate. In a substantial majority of the leases which we operate.

Q What in round numbers is the percentage of your ownership?

A Of the working interest?

Q Yes, sir.

A As a general rule we are from approximately 3/8ths, 1/4 to 3/8ths working interest per well.

Q You have 25 to 37½% interest?

A Right. We have as high as 100% and a number of wells with 50, others with a sixth.

Q I respect your desire not to reveal the names of those who participate in the drilling of wells, Mr. Trueblood, and I will try and do the best I can to elicit from you the information with reference to your joint interest owners, which I happen to have because of division orders which we have signed as an overriding royalty owner. I think in the Gross well that you refer to, which is located in Section 7, Township 31 North, Range 12 West, the Ohio Oil Company owned the lease on the Southeast Quarter of that particular section at one time, I believe, and is it or is it not true that we farmed that out to Consolidated?

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A That is correct.

Q And in that connection --

A I presume it's the Southeast.

Q And in that connection is it a fact that the Ohio told you that it did not wish to drill a Dakota well, it didn't feel it was economic?

A As a matter of fact, Mr. Everett, the Ohio Oil Company stated at the time that they didn't believe that the Dakota formation was economic in the San Juan Basin.

Q But we did farm the acreage out to you?

A That's correct.

Q And you felt it was? A That is correct.

Q And agreed to drill a well to the Dakota so as to earn the acreage in that Southeast Quarter?

A That is correct.

Q And Ohio retained an eighth override in that Southeast Quarter?

A That is correct.

Q Later it was communitized with the Southwest Quarter on which Consolidated or someone else owned the lease, is that correct?

A That is correct.

Q So that our override in that particular half section,



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then, was reduced to a 16th?

A That is correct.

Q A full 16th override? A That is correct.

Q Now, from the division order which I have and, there again, I want to protect you if I can, but I want the record to show what the situation is, and I have a division order dated September 6, 1960, covering the Government Gross 1-7 well located in Township 31 North, Range 12 West, NMPM, Section 7, the South Half, and in analyzing that division order, Mr. Trueblood, and I'll hand it to you if you want to check my calculations on it, they are approximate.

A All right.

Q And I'll not introduce it in evidence unless you insist, it gives the names of all the interested parties. I find there that there are fourteen working interest owners, no, fourteen overriding royalty interest owners?

A Right.

Q Fourteen overriding interest owners, the Ohio Oil Company having an overriding royalty of .6324913 which is the equivalent of 1/16th, I also find that there is a production payment in there in the amount of \$3,905.25, which is figured at the rate of \$25.00 per acre, I believe on 156 acres, which was owned by one of the parties, which, when that is paid off,

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converts into an overriding royalty of .24703 to one party and .24707 to another, is that correct?

A I presume it is. I'll take your word for it.

Q I wouldn't want to state those figures are exactly accurate because I'm not a very good mathematician, but it all adds up to an overriding royalty of approximately 12½%?

A That is correct. It's approximately a 75% lease.

Q The total working interest is 75% in that Gross lease?

A Right.

Q From which, if I understand the basic contracts and so forth, Consolidated, as operator, must pay all operating expenses from 75% of production?

A Consolidated, et. al.

Q Well, Consolidated and the other working interest owners?

A Right.

Q I find also from reviewing that same division order of September 6, 1960, that there are seventeen working interest owners, which includes Consolidated and sixteen others?

A Well, it seems logical.

Q Well, I can introduce it in evidence if you want me to, Mr. Trueblood.

A That's all right.

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Q I don't want to embarrass you or Consolidated, either one, but I think the facts are important. I find that Consolidated is the largest working interest owner, with 35 plus percent in the breakdown.

A That's right.

Q The next largest one has 9.37½%, there are four with 4.63%, one with 2.34%, two with 1.15%, one with .15%, one with 1.7%, three with three-fourths of a percent, and two with .7 or approximately a half a percent. Do each of those working interest owners, are they billed by your company for their costs of operation or are these what we refer to, or any of them, what is commonly referred to as a carried working interest?

A None of them carried working interest.

Q I notice that one of these working interest owners has the same name as the well is named. Can you tell me how it happened that that well was named Gross No. 1?

A Well, actually, in order to avoid confusion on 65 kinds of United States Government numbers and sets of numbers, we determined to name certain of our wells in honor, or in some cases maybe not in honor, of a specific individual who was a participant, Mr. Everett.

Q I just wondered, did Mr. Gross pay anything extra for that honor?

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A No, as a matter of fact, the only thing extra that he paid for the honor is the fact this was drilled in 1958, '59, prior to the present formula.

MR. PORTER: Mr. Everett, may I interrupt at this point?

MR. EVERETT: Yes, sir.

MR. PORTER: We are going to recess the hearing until 1:30, at which times you may resume your cross examination of the witness.

MR. EVERETT: Thank you.

MR. PORTER: The hearing will be in recess until 1:30.

(Whereupon, a recess was taken until 1:30 P.M.)

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AFTERNOON SESSION
April 18, 1962

MR. PORTER: The hearing will come to order. Please proceed, Mr. Everett.

CROSS EXAMINATION (Continued)

BY MR. EVERETT:

A Excuse me one second. I would like to correct one item in my previous testimony.

Q Yes, sir.

A As concerns operating costs on the Gross No. 1-7, my staff informs me that the operating cost at the time that we drilled the well and during 1960 was 10 percent; during 1961, the first year of proration, was 25 percent; and on the projected 1962 allowables, it's 40 percent.

Q Thank you. We were discussing those items of operating cost. I presume you have a gas sales contract that covers the production from this Gross 1-7 and the other wells with reference to which you've testified?

A That is correct.

Q With whom are those contracts?

A Actually the contracts are with two different concerns. One is Southern Union Gathering Company, in the one instance, combined with El Paso on some sort of a swop-out arrangement; and the others are with Southern Union Gas Company.

Q Do you know whether either of those contracts is a sale for resale in interstate commerce as that is defined in the



Natural Gas Act?

A Insofar as the gathering company, Southern Union Gathering Company contract is concerned, it is an FPC item.

Q Is the contract with El Paso also subject to Federal Power Commission control?

A It is.

Q So that both of your contracts are subject to the provisions of the Natural Gas Act, and to the regulations and orders of the Federal Power Commission?

A Only insofar as the Gross 1-7 farmout from Southern Union and us is concerned; and as to the other farmouts of the other three wells with Ohio are concerned, those are all intrastate.

Q What about the sales from the other properties in which you have, or Consolidated owns or has an interest, or operates?

A Approximately sixty percent of them would be under intrastate contracts and forty percent would be under interstate contracts.

Q What prices are provided in those contracts?

A Well, in the El Paso contract, which is the interstate contract, it provides for twelve cents per thousand base, with a one cent minimum on our share of the LPG products. In the instance of Southern Union Gas, the sales price is a straight thirteen cents per thousand.

Q Those contracts do not cover, then, what do you call it,



condensate or --

A Condensate; no, they do not.

Q What is it, let's say in barrels per million cubic feet of gas, what is the content or the average content of the gas which Consolidated owns or produces?

A From which wells, Mr. Everett?

A Well, from all wells. Do you have an average?

A Mr. Everett, for our projection of economics, as a general rule we use from twelve to fifteen barrels per million cubic feet. However, we have wells that produce as high as thirty to thirty-five barrels per million cubic feet, and we have wells that produce as low as six per million cubic feet, depending on the particular area that we have, the wells in the particular portion of the Basin.

Q Do you recall it in the Gross and Leeds wells?

A I would say in the twelve to fifteen per million bracket.

Q And you have arrangements under which you sell the condensate in this gas?

A That is correct.

Q What does it bring per barrel?

A At this moment I don't know, because it's changed anywhere from five to fifteen cents at various and sundry times during the life of these particular wells; on the order of two fifty-five or two sixty-five per barrel, less trucking charges.

Q Which would leave a net of what, two twenty-five?



A Two twenty-five, two thirty-five, two forty-five.

Q Have you figured that out as to how much that amounts per MCF of gas?

A Mr. Everett, we use in our economic studies, for purposes of our gas payouts and in order to relate it strictly to gas, we use fifteen and a half cents, fifteen to fifteen and a half cents per thousand cubic feet, and include the condensate therein; and thereby make our projections on the required amount of cubic feet which would have to be produced from a given well to acquire payout.

Q Over a given period of time, so that if your payout -- you say you used the figure from fifteen to fifteen and a half?

A Right.

Q So when you were referring to payout period of thirty years, you were figuring fifteen to fifteen and a half cents per MCF as to the gas ultimate recoverable under the present formula, to arrive at that total payout figure?

A Yes, that's correct. Under the existing gas price. We, of course, all hope for an increase.

Q Do you recall whether your contracts have a provision in them for an increase?

A They have an escalation provision of one cent each five years. I believe that, in both cases, that the escalation would become effective on January 1st, 1964, provided that the FPC goes along with the escalation.



Q In estimating the payout period, did you consider that you would or would not receive that increase in price?

A We have considered that we would get the one cent increase each five years.

Q So that would it be fair to assume that in reaching your calculations, you have used the most favorable picture, I mean from the standpoint of making that payout period as short as you could?

A We certainly would like to. We have one hidden factor, which is the declining market per well, and this has been an unknown factor to us in our calculations before we drill a well.

Q If you add fifteen and a half cents -- I can do my figuring better if I use sixteen cents per example, because I can divide it by the 1/8th. You make your calculations and just assume we can apply these figures to fifteen and a half, but for convenience of counsel, let's use sixteen because I can't keep up with your mathematics too well. If you have an eighth royalty to pay on the proceeds of gas from your lease, then that cuts the working interest by two cents, doesn't it?

A Approximately, that's correct.

Q So that you would then have fourteen cents with which to figure your payout?

A No, twelve cents, because there's an eighth royalty to the Government also.

Q You have an eighth royalty, that's two cents, and then



an eighth override?

A So you have twelve cents.

Q So you figure twelve cents?

A That's right.

Q In applying that same eighth to a payout number of thirty-two years, let's say again for my convenience, if you had an eighth override and a thirty-two year payout, why that would increase that payout period by four years, wouldn't it?

A That's correct.

Q So that in your economic picture, so far as you are concerned the payout period would be extended in direct ratio to the amount of overriding royalty you had to pay on a given lease?

A No question about it.

Q I think that should be made clear, and I had hoped that you had made your calculations along those lines.

A Right.

Q I had no reason to believe that you wouldn't. Now then, you testified, I think, that you had an interest in or operated about ten percent of the wells in the Basin-Dakota Pool?

A That is correct.

Q Sometimes you engineers refer to a figure that doesn't mean too much to me, but how many wells are you talking about when you talk about ten percent, sixty wells?

A I said I believe it was fifty-seven, in order to be commensurate with our February numbers that we were utilizing



in our testimony, and it's slightly more than the 507, slightly more than ten percent.

Q You testified that the working interest of Consolidated in those wells was 25 to 35 percent, I think?

A Average.

Q That's 25 to 35 percent average. To get your engineering term, how many net wells out of the 57 would you say Consolidated had?

A Net working interest wells or net division order wells?

Q Well, tell me what's the difference.

A Well, there's a considerable difference. When you report net wells, as a general rule, to your stockholders, you are reporting net working interest wells without regard to royalty; in that instance, we're talking about something on the order of twenty net wells. However, our average overriding royalty or our average lease is something on the order of 80 percent, so we are talking about in the order of fifteen to sixteen net division order wells.

Q Well, I mean one way, then, if I understand your net well figure, if you exclude your overrides then you have more net wells, and if you include your overrides you have less net wells, is that correct?

A That is correct. In other words, in the working interest wells, for purposes of computing operating costs, you must look upon it as net well operating cost; and for purposes of

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payout or purposes of income, you must look at it from net division order wells.

Q Well, that is for the reason that, to reimburse the operator for the cost of production he has to pay it out, reimburse himself only out of that portion of the gas to which he's entitled under the division order?

A That is correct. I would like to amplify that in that all of our participants own their share of the gas and own their share of the royalty, and also have an interest in the cost of operation.

Q Let's go back to the No. 1-7 well for a moment. In there, I believe, if my calculation is correct -- and again I don't want to embarrass you the least bit, Mr. Trueblood, by introducing this division order in evidence, and I don't propose to do that, but I think I speak correctly that there are 17 working interest owners in there. When, if you recall, did you sell the working interest to your working interest or co-owners?

A Well, actually, in this instance, Mr. Everett, and I'm glad you brought that up because we have a 160-acre tract in the specific well to which you refer, the Gross No. 1-7, which was in an original farmout from Southern Union Gas Company, in which we had certain participants in a very substantial block of some 3,000 acres in the general area we're speaking of. We subsequently acquired additional farmout acreage from Ohio in the form of approximately three and a half drilling units, the one-half adjoining the



Southern Union acreage; and our partners who were with us when we came to the San Juan Basin carried their interest and paid for their prorata invoice cost of participation to the extent of their share of the 160, whereas new participants who had joined us in 1959 -- as opposed to having been with us in 1956 -- participated in the other 160 to the extent that their interests were in the total 320. So this accounts for the fact that there are 17 owners involved in this, whereas the general rule of thumb is around eight owners in our various units.

Q Now that well, Gross No. 1-7 well is in the South Half of Section 7 in the Dakota formation, but the joint operation to which you are referring now is one that was in the Mesaverde formation, is that correct?

A No, even the joint operation as it pertained to the Dakota formation, the participants who were with us in the original 160 were not necessarily with us in the separate 160 farmout, as to the Dakota rights themselves.

Q To be specific, I don't have the numbers, of course, but if you recall, did any working interest owner pay more than the fractional percentage, as shown on the division order, of the cost of drilling Gross Well 1 No. 7?

A Those who were in the new 160-acre tract who participated in the -- I'll call it the Ohio farmout, in a three and one-half well farmout, did pay approximately fifteen percent more than the invoice cost for that participation in those wells.



Q The net result, then, in drilling Gross 1 No. 7, was that Consolidated to the extent of that fifteen percent overage was relieved of paying what otherwise it would have paid, which was approximately thirty-five percent of the drilling and completion, equipping costs of that well?

A I believe your numbers are thirty-five percent division order, which is forty-five percent working interest or thereabouts, and so that the other participants in this instance who were in the Gross Well, insofar as the Ohio 160 is concerned, the markup involved represented less than five percent of the total cost of the well, if you follow me.

Q I'm trying to follow you. I wondered what the net percentage of that well Consolidated paid.

A We would have paid approximately forty percent of the working interest for the forty-five percent that we paid in that specific well.

Q I'm not going to burden the record by going through all of the correspondence and what-not we have had with Consolidated, but for the record, I think it should show, and I believe you've confirmed this -- and there again, I have a communitization agreement dated September 1, 1961, which communitizes the entire South Half of Section 7 as to the Dakota, and prior to that time it had been assumed that the two halves which you show on your map here were equal in acreage?

A That is correct.



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Q But it was discovered there was a slight variance in acreage. I think the portion that you, Consolidated and others contributed to that unit had 156 acres and Ohio's acreage was 160, so that there's a slight difference in there; but so that our override spread over the 316 acres was a little more than the 160?

A That's correct.

Q Again, I hand you the communitization agreement. I don't propose to introduce it in evidence, but that's the Basin-Dakota Agreement. In summarizing that, I find that either your particular -- under what's defined as Tract 1, which is the Joe Reed lease, the Federal lease FSP-023, that there are 27 working interest owners.

A No, that is not correct. Mr. Everett, I don't believe most of these others are overriding royalty, if you'll look at the top of page 2. As a matter of fact, there are only five working interest owners other than ourselves in this particular tract.

Q Then the overriding royalties are on page 2 of the agreement, and how many of those are there?

A Appears to be about eleven, plus two on page 3 is thirteen.

Q If my figures are correct, that override in that case totals about a sixteenth --

A That's correct.

Q -- on the entire tract. Now let's take some of the



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other wells, what about the Leeds wells, you testified with reference to the Government Leeds 1 Well 8. I have a division order from our files dated September 6, 1960, covers Leeds No. 1-8 well, Section 8, West Half, Township 31 North, Range 12 West, NMPM. That covers gas production from the Dakota formation under those lands, and in there I find the Government having a royalty interest of twelve and a half percent, and the Ohio Oil Company having an override of twelve and a half percent, or one-eighth; and I find one, two, three, four -- twelve working interest owners with interest varying from one and a half percent to as high as 9.375 percent. Is that the way that lease is owned?

A That appears to be correct, that's correct.

Q What about the costs of drilling that well?

A The costs of drilling this well were borne approximately forty-eight percent by Consolidated Oil and Gas, and fifty-two percent by its associates in this particular drilling unit; and once again, we have our fifteen percent markup.

Q Is there any significance to be attached to the naming of that well as Leeds Well?

A Very similar to the Gross, same reason.

Q You are just honoring Mr. Leeds?

A Correct.

Q You didn't charge him anything for the honor?

A No. As a matter of fact, he got quite an honor, because it was above average deliverability well.



Q As a matter of fact, I think Mr. Leeds had about nine percent or plus, nine plus percent interest in that well. I would like to go through the rest of these. Is your general plan of financing wells where you have joint working interest owners to have what you call a markup of fifteen percent?

A That is correct. This is what we call our charge to cover our general administrative overhead expenses for the purpose of looking for deals for drilling associates in high tax brackets.

Q Going back to your exhibit, I guess you didn't introduce it, the drawing that you had this morning. If I recall your testimony this morning, it was your opinion that the size of the well bore had something to do with deliverability, is that correct?

A No, it is not correct. However, it does have something to do with it, but very minute in this instance. My purpose of illustration in this instance was to try to create what I would call an orifice or a needle valve on a fixed volume tank, and that needle valve is cracked open to 800,000 cubic feet a day, and this needle valve is cracked open to 2,000,000 cubic feet a day, and it merely, stated very simply -- and this doesn't require a lot of engineering prowess -- when this one was exhausted, that this one would be only half exhausted if it had the same volume of cubic feet of propane or butane or natural gas or what have you, inside.

Q That's based on the assumption that the volume that's



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inside of that box is the same throughout the box, is that correct?

A That is correct. This is the only purpose of this. This was merely an attempt to hit at a lay explanation of what correlative rights basically is.

Q And to further that same explanation, I think you introduced another exhibit that referred to the Leeds and the Gross wells?

A This is our Exhibit No. 1.

Q Was it your intention to leave the impression that that which is shown on Exhibit 1, plus your testimony with reference thereto, was to bring it into direct relation to this other graph that you have drawn?

A My purpose in this instance was to illustrate that this condition exists on offset wells throughout the San Juan Basin, that you have very similar sand characteristics on immediately offsetting wells from a standpoint of porosity, water saturation, sand thickness, and all the elements that go into gas in place; and that in this instance we merely show this as one. There are probably 50 or 100 such cases; unfortunately, we didn't have the time to present 50 of them, but in any event, we just merely point out that here are two wells completed by the same man, perforated in the same manner, fracture treated in exactly the same way, with apparent same log characteristics, and in one instance you wind up with a deliverability of an average deliverability well; and the other is an economic failure. That was the purpose of this.

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Q Is the Commission to assume that your testimony is that that situation exists throughout the entire area which it has defined as the Basin-Dakota area?

A It exists, not in every single square mile, but it exists innumerable times in the different areas in the San Juan Basin, whether these numbers are 2,000,000 and 6,000,000, or whether these numbers are 300,000 and 600,000.

Q Is it your testimony as an expert witness, petroleum engineer -- put that hat back on, if you will, for a minute -- that this Basin-Dakota formation under this field, it would be reasonable to expect it to be the same throughout the area covered by the field?

A It is basically and generally a fairly consistent reservoir with local variations in particular lensing and, for example, what a great number of people call the graneros section is well defined and well developed in portions of the field, and less well defined in other portions; but it appears that when the graneros becomes more defined in a lot of instances, that the Dakota one, two, three, call it what you may, the benches of the Dakota formation itself in some instances begin to disappear.

Q Do all benches of the Dakota appear the same in these two wells, referring to your Exhibit 1?

A For purposes of this exhibit, we would call this our graneros section, we would call this what we group together as our main productive Dakota zone in this area.



Q You are referring to the bottom half of the Gross --

A The bottom half.

Q Gross 1-7?

A That is correct. With the apparent same thicknesses in each of these zones. Now in this one instance, we have a penetration of one little particular piece here that was not shown on the log here.

Q You are referring now in Leeds 7, you have a penetration that you didn't find in Government Gross --

A We didn't drill as deep.

Q You didn't drill it?

A At the time that we logged it.

Q What area, if you know, is covered by the Commission's definition of the Basin-Dakota Field?

A As I recall, it was fairly broad in that it stated all of Rio Arriba and San Juan Counties which is productive of gas from the Dakota formation. That is what I was leading up to today, is that we don't know the size of it, but apparently from indicated productive Dakota wells throughout the Basin, that it must be something on the magnitude of possibly 5000 320-acre units.

Q And you think that each acre there is equivalent to each other acre, at least 85 percent equivalent?

A On an average.

Q No, your testimony was that you thought the formula should be 85 percent acreage and 15, but that you didn't have



enough guts to ask for more than 40-60.

A I would say --

Q I'm referring back to your 85 percent. Just what area are you referring to when you say it should be 85 percent acreage?

A I'm saying that the Basin-Dakota Field as a whole fits within this average concept of approximately three and a half to four billion cubic feet; three and a half billion cubic feet, if you will, and in order to properly drain and get your fair share of the gas under each 320-acre tract, that you must not have a formula which grants more than a 60 percent -- even by El Paso's -- a 60 percent variance in withdrawals, no matter what the deliverability is, in order to stay on the average.

Now the New Mexico Oil Conservation Commission has a very unique system of eliminating all of the problems of the wells that won't make it, in that they redistribute and the bigger wells get their share of the left over underproduced allowable; so that in fact, even if they instigated this 60-40 or 85-15, those that didn't make it would go back to the higher deliverability wells, anyway. It's a pretty mathematically sound approach.

Q That is your opinion?

A It seems to be mathematically correct, if you have something over and you redistribute it.

Q Isn't it based on the assumption that 85 percent of the acreage in this area which has been defined is equal, insofar as the Basin-Dakota Formation is concerned?



A Only on the average, and that's average, above average deliverability and below average deliverability; and going back once again, if it gets outside of the norm of the average, it's taken care of through the redistribution schedule, and this is the basis of my statement.

Q That's the basis of your statement. But aren't there also many areas in the field which would be comparable to your 640-acre box where there are dry holes that also penetrate this same formation?

A I have stated that we have extremes out here and there's no question about zero permeability, zero deliverability being zero reserves. I think we have a common denominator for that that's called a dry hole. As we move up from that point, Mr. Everett, I stated further that at 200,000 cubic feet per day, that's just some deliverability, granted enough time could produce its half billion cubic feet of reserves by El Paso's work, it just has to have its chance; and that in order for it to have its chance, I say it takes an 85 percent acreage factor to even get the chance.

Q Then you have no objection to cutting down the good deliverability wells in favor of a dry hole then?

A Well, obviously a dry hole doesn't get any deliverability at all.

Q It gets 25 percent of nothing under the present formula, and you want to increase it to 60 percent of nothing, so I can't --

A I can't see how it gets anything, it never gets



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completed. One of your requirements is, in your gas contract, that you have to get El Paso or Southern Union to come and get it. I think we have eliminated these freaks of 250 and 300,000 down because they won't come and get it in the first place.

Q Let's get back to your average well. Isn't it a fact that the Basin-Dakota Pool has been fairly well defined by dry holes drilled almost around the entire perimeter of the Pool?

A I'd say that the area on the southwest side of the Basin is fairly well defined from the standpoint of water problems. I would say that we have defined very well the northwest end of it with a couple of dry holes and some that we have attempted to complete; through cement failures or otherwise, we were unable to complete as economical wells. I would say that the northeast side of the San Juan Basin, which is over in the Colorado portion, it is of no concern to this Commission, has not been as well defined as some of the other portions. I would say that the southeast portion of the San Juan Basin is not even nearly clearly defined at this time, although we don't yet know whether we're dealing with oil wells and gas wells in that particular area.

Q Would you say that in the areas where the dry holes have been drilled, you said you had drilled a couple, Consolidated has drilled a couple -- let me back up a notch. If you know, what kind of a structure is this?

A What kind of a structure?

Q Yes, sir.



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A Well, actually --

Q Is it an anticline, syncline?

A It's a basin, per se, with localized structure present in the Dakota formation itself. What are you speaking of, the San Juan Basin as a whole? It's a sedimentary basin.

Q Is it a stratigraphic trap, isn't that what the geologists call it?

A Which formation are you talking about, again?

Q The Dakota.

A It is basically a stratigraphic trap with localized Dakota highs and localized Dakota strokes. As a matter of fact, where the localized situations seem to occur appears to influence in some way the natural fracturing system that is present. If we knew the answer, well, we would have a lot higher deliverability wells than we do.

Q Well, I think no one would drill any dry holes, either, but you are asking this Commission to 85 percent treat this area as if that formation was the same under 85 percent of the wells, and I don't believe you'll testify that the formation is the same.

A Actually, Mr. Everett, this is not what I said at all. If you will go back to what I actually did say, is that the formula we've asked for, which has now disappeared from the board, still gives -- this 60-40 that we've asked for still gives a two to one advantage to the higher deliverability wells, even in spite of the fact that it should be the other way around.



Q Then the correlation as between gas in place and deliverability actually exists, then, doesn't it?

A I also testified that at some lower range this is probably true, at the very very low range, but on El Paso's work it is immaterial. Back to your gymnastics, you can draw any kind of line through these points that you might desire.

Q My gymnastics -- let's go back, if we want to talk about gymnastics, let's go back and get your remarks on oranges and apples. I intend to be courteous with you, but don't call my cross examination gymnastics. I take personal exception to that.

A I was talking -- I am talking about the gymnastics of drawing a line through this.

Q Who is the vice-president of your company?

A J. B. Ladd.

Q Would you recognize his signature?

A Yes.

Q Would you look at this, please? Is this Mr. Ladd's signature?

A Yes.

Q Is this Consolidated's letterhead?

A That is correct.

MR. EVERETT: Would you mark this Ohio Exhibit A, please?

(Whereupon, Ohio's Exhibit A marked for identification.)

Q (By Mr. Everett) Why don't you be seated, Mr. Trueblood, my temperature has gone down now.



A All right, sir.

Q This is a letter dated September 29, 1959 --

MR. STOCKMAR: Could I have an opportunity to peruse this before we seek to have it introduced in evidence?

MR. EVERETT: Yes, sir. I just found it Friday. I did get the photostating department to make two copies. I apologize for not having more, but that's all the time I had.

MR. STOCKMAR: We have no objection to your use of the letter, Mr. Everett.

MR. EVERETT: I'll offer the letter dated September 29, 1959, from Consolidated Oil and Gas, Inc., addressed to the Ohio Oil Company, Post Office Box 120, Casper, Wyoming; Attention, Mr. R. W. McCanne; marked for identification as Ohio's Exhibit A, and I'll offer it in evidence in connection with this cross examination.

I would like permission of the Commission, if I may, to substitute a photostat for the original, since this is an original company record. Do you have any objection to that?

MR. STOCKMAR: No.

Q (By Mr. Everett) You have read the letter of Mr. Ladd, have you, Mr. Trueblood?

A I have.

Q Without getting into too much detail in it, it was addressed to the Ohio Oil Company on September 29, 1959, and you refer to our jointly owned Government-Owens No. 1-7 well in Section



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7-31-12, and are seeking us to go along with the proposition to deepen that well to the Dakota, is that correct? I mean, the letter speaks for itself.

A Actually, to re-enter the well which had been drilled to the Dakota originally by Ohio and Consolidated, and to hang a liner and complete same as a producing Dakota well, since we had learned in the area that you didn't have to have a natural flow, necessarily, to make a commercial Dakota well.

Q In that letter to us, you advised us that you had drilled that Mesaverde well, one that was completed to the Mesaverde, to the Dakota penetration of 89 feet, and that you had a drill stem test of the whole Dakota interval, which established a stable natural flow of 10 to 15 million feet of gas a day.

A I believe that was 10 to 15 thousand cubic feet of gas per day.

Q You are correct.

A Which is quite a difference.

Q Yes, there's quite a difference, I realize that. Then in the letter, in some detail you tell us of the completion method which you propose to use in your Owens 1-7, "to build a simple sodium bentonite mud with a low water loss characteristic, drill the seven inch casing plug, wash to the top of the cement plug opposite the Dakota Formation, drill the Dakota plug, and deepen to approximately 6860 feet. We then would run a 5 1/2 inch liner with turned down couplings as we have done in several instances



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in this area, hanging it from the base of the 7 inch and circulating cement around same. We would then after WOC run a collar log and perforate the prospective Dakota Formation. If necessary, we would selectively break down the various Dakota intervals with acid and then proceed with a sand-water frac utilizing some 60,000 lbs. of sand in 40 to 60,000 gallons of water."

Then you go ahead and describe how you would complete the well, and so forth, and that you might want to mud acid wash the Mesaverde when you got through with the Dakota frac. You estimate a cost with reference to the well, and attach a cost sheet to it showing the cost of that rework to be your estimate of \$53,200.

I do not have the original of Ohio's response to that letter, but I have obtained from the files and records of the company regularly kept in the due course of business a carbon copy of the letter which was addressed to Mr. Ladd. I will ask you, Mr. Trueblood, if you recall ever having seen the original of that letter?

A No, I don't remember seeing it, but I'm sure that it was sent because of my knowledge of the subsequent transaction.

MR. EVERETT: I will ask if you will mark this Ohio's Exhibit B.

(Whereupon, Ohio's Exhibit No. B marked for identification.)

MR. EVERETT: We offer in evidence Ohio's Exhibit B, and ask permission to substitute a photostat of it, if we may, and



withdraw the original for our permanent record.

Q (By Mr. Everett) Referring to Ohio's Exhibit B, which was an answer to Mr. Ladd, Mr. Trueblood, in response to the letter which is marked Ohio's Exhibit A. Mr. McCanne, our Division Manager, advised you that: "As far as we are concerned we would much prefer to continue to produce the Mesaverde formation, which to date has made in excess of 100,000,000 cubic feet of gas, and not take a chance on injuring this formation by attempting a dual completion. A study of the existing Dakota completions indicates that the production varies considerably throughout the area, and it is possible that the economics of the majority of the Dakota wells may be marginal, at least resulting in long-term payouts."

MR. EVERETT: I understood the Commission to give me permission to withdraw these.

MR. PORTER: Yes, that's correct.

Q (By Mr. Everett) Following this letter, did Ohio make a farmout to your company of the Dakota rights under that particular acreage?

A Under that, plus three other drilling sections.

Q Plus three other drilling sections?

A That is correct, or Half Sections, I should say.

Q Did you, following that farmout, drill a well on the South Half of Section 7?

A We did.



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Q Which you referred to as the Gross well?

A Yes.

Q You did not attempt to complete it in the Mesaverde?

A It already had a Mesaverde completion.

Q It had a Mesaverde completion?

A That's right.

Q You deepened the well, then?

A No, we drilled a new well, but the rights were already gone, and participated in by Ohio, and there was no way to Mesaverde dual since the unit had been formed and was being completed through the Owens No. 1.

Q The well that you drilled under the farmout was a Dakota well, is that correct?

A That is correct.

Q Would you explain to the Commission how you completed that well?

A Well, actually --

Q If you know.

A I didn't physically complete this well. However, we drilled to the depth, of which I don't know the exact depth, set 5 1/2 inch casing, perforated, fracked, and I'm not even sure of the number of fracture treatments involved in that specific well. However, I am familiar that the two wells involved had identical treatments.

Q The two wells, meaning the Gross and the Leeds Dakota



well?

A And the Leeds, that's right.

Q They had identical treatment, yet I think your testimony was that one had a deliverability of 709 and the other one had a deliverability of 1387, as shown on Consolidated's Exhibit No. 1?

A That is correct.

Q So having had the same treatment in the drilling thereof, to what do you attribute the difference in that deliverability?

A I wish I knew. The only thing it could possibly be, obviously, is that there is a difference in the fracture system penetrated in the specific well bore in which each of the wells were drilled.

Q Then if I understand your testimony as an engineer earlier, the formation under those two wells is the same?

A Yes, basically is the same; it contains the same amount of reserve.

Q And you can't explain the difference from any known fact, then?

A The only factor that it could be is whether one of the wells happened to penetrate a natural fracking system that the other did not, which is not to say that, had the location instead of the Southeast Southeast would have been in the Northeast Southeast, it may not have penetrated the same fracture system that the other well did.

Q But there is a difference in the permeability, did you



say?

A Yes, because of fracturing.

Q Because of fracturing?

A Yes.

Q You don't think it's a natural difference?

A I do not think there's a natural matrix permeability difference to amount to anything, more than maybe five or ten percent variation.

Q You testified with reference to two dry holes which were drilled by your company. Did you attempt to complete them in the same fashion you attempted to complete these two?

A As a matter of fact, we did not attempt to complete the two wells in the same fashion. In one instance, the Dakota sandstone was at a very shallow depth, we drilled on what is known as the hogback area, and was so broken up and so unlike Dakota wells in that instance a couple of miles away, and indicated from porosity and the characteristics of the log that it was not worth an attempt to complete in that particular formation.

In the other instance, we drilled a well on the extreme east side of the San Juan Basin, and I believe 28 North, 2 West, which was -- we called our No. 1 Jicarilla, which we wound up fishing in a beer can at about 8400 feet. By the time we got to total depth and were unable to complete it in any way, in any event, because we could just barely penetrate the Dakota formation and had no log of it.



Q And on an acreage basis, you would have 100 percent allowable for both of those wells?

A Not if I couldn't hook them up. You only get an allowable, Mr. Everett, if you have a well hooked up. We have numerous wells right now awaiting hookup that we would love for them to go getting an allowable now, but they don't get them until they are hooked up.

Q It's your testimony, then, that this formation, whether or not it's productive depends solely on the manner in which the well is completed?

A No, I do not make that statement. I made the statement that the deliverability of a specific well might vary from well to well with the techniques used, and we don't know that we have the finest techniques or the worst techniques; but if we employ the same techniques then the only thing that we can possibly attribute this specific change in deliverability to is because of natural fracturing which might be available to that specific well bore, or may not be attributable to that specific well bore, none of which you can actually read effectively from your logging tools.

There are indications of fracturing, but they don't measure width nor extent nor lateral extent or what portion of the 320-acre tract these fracturing systems might be running.

Q Let me put my question another way. Apparently I'm not, I just don't understand your position, quite. You testified a moment ago that you drilled a dry hole in the Dakota formation,

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you didn't complete it because that formation was so broken up that you didn't think it was worth while to complete. Is it reasonable to assume that that situation might exist throughout the field?

A No, it is not.

Q You think that's one place?

A This is just one place that happens to be a localized situation on the hogback at almost the outcrop of the Mesaverde formation.

Q Let's take some of your other wells now. I don't know how many of your wells fall in what bracket that you have there, but let's take a well that has low deliverability, it's a Dakota gas producer. Maybe you can give me one so I can have a specific example, where it was completed in the same manner that you completed the Gross and the Leeds well, which had a lower deliverability or higher, shown on those examples. Are those exemplary of all the wells in which you have an interest?

A No, it isn't. We have, for the most part, wells -- well, as a matter of fact, our operated wells and our operating interest, as I stated earlier in my testimony, the interest in the wells in which we own interest, we have an average deliverability factor of 1590 MCFD. Even as to our farmout of the three wells, we are very pleased and very happy even under the existing formula that we have, the specific units, because they're still, even under the existing formula, average or above average, with the one



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exception of the Gross well, they're average or above average deliverability wells.

Q How do you explain the difference in the Gross well, then?

A The only thing it could possibly be, in my estimation, is the lack of accessibility to local fracturing within the well bore itself, which is not to say that if the well bore had been moved 40 acres within its drilling unit that it might not have encountered those same fracture systems; and you are unable to predict them from the surface or unable to predict --

Q Do you find the porosity and permeability the same in all the wells?

A Basic variation, if you are talking about permeability of the Mat^fxix, the basic variation from what we can tell on the logs, and the porosity, probably varies from six to eight, at most 20 to 25 percent, which is far below what we see in the average relationship here of this 60 percent change.

Q Is it your opinion that that difference in the fracturing capability, let's say, of the formation, that that should not be given consideration by the Commission in fixing the allowable, except to 40 percent, I think you propose now?

A That is correct. We are proposing to give it a try at 40 percent deliverability factor.

Q How long have you been operating in New Mexico?

A Since 1956.

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Q Have you read your application which was filed in your behalf by Mr. Kellahin?

A No, I have not.

Q You have not. I won't ask you any question about it, then. I have here Consolidated Oil and Gas Company, Inc., 1960, Annual Report.

MR. STOCKMAR: If the Commission please, it was my understanding that an objection to testimony relating to the financial affairs of the company has been sustained by the Commission. This seems to be an effort to renew that.

MR. EVERETT: I don't think your objection -- I didn't understand it to be leveled at the Commission knowing the affairs of this company. You have come to this Commission complaining that your correlative rights are not being protected and asking that those of others be destroyed for your benefit, and I would --

MR. STOCKMAR: We are not asking that.

MR. EVERETT: I would like this Commission to know what the president of your company has had to say when he was not under oath in connection with this Field. Now that's the purpose of this, Mr. Stockmar.

MR. STOCKMAR: May I inspect that before we proceed? Do you have specific portions, Mr. Everett, that you are referring to?

MR. EVERETT: I'll submit the whole report.

MR. STOCKMAR: Gentlemen of the Commission, before



proceeding, I would certainly like to have Mr. Everett announce what his purpose is in getting into this Report to the Stockholders and Annual Report. It still seems to me to be totally removed from the scope of this particular hearing. I don't think it's material to the questions before us how much money Consolidated made or lost at any given period.

MR. EVERETT: I won't go into the financial statement part of it, if that's your only objection to my using it.

MR. STOCKMAR: I'm trying to see what bearing it has on the matter at issue here, as to whether or not this is a proper and fair allocation formula.

MR. EVERETT: I think it has a lot to do with it. He has testified with reference to reserves having no relation to deliverability, but when you are telling the stockholders about it, it has a great deal of importance. As I understand his testimony, he complains about the payout period; yet he tells the stockholders that's a good thing because we are going to have gas for thirty years down the future. Now he has to make up his mind one way or the other which way he is going to go. This is contrary to what he has testified to. Now that's my purpose, to impeach your witness. I think I am entitled to a shot at it. I think I can impeach the witness with his own Annual Report.

A I don't have any objection to it.

MR. STOCKMAR: We feel this is entirely outside the scope of this hearing, but Mr. Trueblood has issued a letter to



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his stockholders, or a report, I'm sure he's willing to stand behind it. If you can impeach him, go ahead.

Q (By Mr. Everett) Mr. Trueblood, I hand to you, and ask you what it is.

A It's the 1960 Annual Report of Consolidated Oil and Gas for the fiscal year ended November 30, 1960.

Q This is a facsimile of your signature, "The President's Message to the Stockholders" appearing on pages 2 and 3?

A That is correct.

Q Your signature on page 3?

MR. EVERETT: I will ask that this be marked Ohio's Exhibit C in connection with this cross examination. I will ask permission to substitute a photostat. I just got it the day before yesterday, and with the strict understanding that I would return it to one of your stockholders, Mr. Trueblood.

(Whereupon, Ohio's Exhibit No. C marked for identification.)

Q (By Mr. Everett) In this Report to Stockholders, there's some items which appear to me, Mr. Trueblood, and possibly you can explain what appears to me to be a difference between your testimony this morning and what you've stated in this report. If you can explain to me and the Commission, why, we'd certainly welcome that explanation. I appreciate your courtesy and frankness in discussing your report.

A May I preface it by saying that I am a lot smarter about ~~the Basin-Dakota Field under the present preration of 1962 after a~~



year of proration than I was on November 30, 1960, prior to any proration in the Basin-Dakota Field.

Q Let me ask you a question. You have been operating in New Mexico since 1956, and in your calculations and so forth, had you considered the very real possibility that the Commission would probably prorate this Field along with others in the State?

A Absolutely. I always operated under the idea that I felt that El Paso Natural, in its demands for gas on the West Coast, were going to alleviate the future sales problem from the San Juan Basin. Certainly I wouldn't have come here in 1956 had I had a different belief, and I still share that belief at this time.

Q I am not testifying. I was going to say off the record that I thought El Paso had been trying to do that, but they've eavesdropped. Here in this report you say: "As seen graphically on the opposite page, Consolidated's new production potential was followed by higher rates of production in the last month as the period of higher demand for gas began."

Isn't it true that each year you have peak demand and low demands, is that correct--

A That's correct.

Q -- in the gas market, even though it's limited?

A That's correct.

Q In the winter months there is more gas produced than in the summer months?

A That's correct.

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Q Then you state that: "While posting only a 27% increase in sales of oil and gas over 1959, Consolidated's net proven gas reserves had a sound 85% increase."

A That's right.

Q So that from the standpoint of your testimony this morning, reserves are a factor, a very definite factor in the allocation formula. At least, you put a great deal of credence on them in this report?

A Actually, I think it's everything in the allocation formula, if you stick to correlative rights, it's whose reserves is the question.

Q Isn't it also a matter of the formation giving up the production, that fracture system you referred to?

A Certainly, but I've already testified that, given time, that a 200,000 cubic foot well will eventually drain its cubic feet.

Q Then you state that: "Net proven reserves of oil and condensate increased 28%." I believe at the time of this report you had some interest in some oil wells, but can you state as between what portion of that 28 percent relates to the condensate that you developed in the drilling of the wells in the San Juan Basin?

A I have no idea at this time, Mr. Everett.

Q You stated: "It is noteworthy that on November 30, 1959, Consolidated had approximately 65 billion cubic feet of net



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proven gas reserves," and that: "Slightly less than fifty per cent were developed. By the end of fiscal 1960, total proven gas reserves had almost doubled, but were still about fifty per cent developed. Thus we are assured of a successful development drilling program for 1961. Nevertheless, Management is maintaining its active search to further increase Consolidated's reserves in the same effective manner as in the past."

"Information concerning our 95% success ratio in drilling during 1960 was contained in the December 1960 President's Progress Report. Of twenty-four wells drilled or deepened for completion attempts in a new horizon, only one was unsuccessful."

I think you are entitled to brag there; that's considerably higher than the industry average for gas wells.

A Well, it was twenty for twenty in '61.

Q You did better the next year. Then you state: "Successful wells during 1960 increased our potential deliverability from natural gas wells by 280% over fiscal 1959. As a result, your Company's net share of gas production capability reached 12,000,000 cubic feet per day as shown on the graph. This is the income equivalent of \$570,000 per year, not counting crude oil or condensate sales."

Then coming on down, and I'm not being critical of your telling your stockholders, don't misunderstand me, but as to the matter of economics and what this Commission should consider, you state: "Five more wells were drilled on our Fulcher-Kutz Dakota



gas properties at no out-of-pocket cost to Consolidated."

A That's correct. That is a carried interest ownership.

Q Where are those wells? Where is the Fulcher-Kutz Dakota?

A We own a third of everything that Sunset International owns, that happens to be our opponents in this instance, in the Fulcher-Kutz or Kutz Canyon Area, Dakota formation production.

Q Those wells were drilled free of cost to you?

A That's right.

Q And they are paid for out of production?

A They're paid out of production, at which time we come in for our full interest.

Q Have they paid out yet?

A Some of them may never pay out, in spite of the fact they had high deliverability, since they had initial cost in one well that exceeded \$243,000. I must add in the defense of Sunset that it was prior to the time they owned the well, but in any event, we haven't received yet our interest, and I think the well's probably produced in excess of two billion cubic feet at this time.

Q Since it doesn't cost you anything to pay them out, the gas, that's bound to be an economic proposition out of those five?

A Actually there are twelve of them.

Q Twelve of them?

A Yes.



Q How far is this Fulcher-Kutz Dakota gas properties from these wells and the other wells that Ohio farmed out to you and those that you owned in that same area?

A Oh, twenty, twenty-five miles.

Q Is this Commission to take your statement, or are they to understand and believe that what you have testified, that this formation should be given the same consideration in the Fulcher-Kutz Dakota area as it is in the La Plata area where the other wells are drilled?

A From strictly a reserve standpoint?

Q From the standpoint of the Commission being charged with, when you have a limited market, with allocating production.

A No, it's my feeling that the Fulcher-Kutz wells probably average on the order of six billion to six and a half billion cubic feet of reserves, and the other wells in the area average four to four and a half cubic feet. So, no, I say that they should have 50 percent more allowable, and in fact, our formula, we're giving them 200 percent more allowable.

Q Too bad Ohio didn't have some over there. You stated that: "Most of our unconnected, shut-in gas wells as of November 1959 have since been connected into gas gathering systems."

You refer on page 5 of this report to a total expenditure in excess of \$2,000,000 in the drilling of more than 135,000 feet of hole during the fiscal year 1960. "Of the twenty-four wells in which the Company participated, only three may be considered



as exploratory. Twenty-one were development wells in furtherance of Consolidated's policy to expedite growth of daily gas productive capabilities."

Do I understand from this that Consolidated itself, for its portion of these wells, spent \$2,000,000, or is that the total cost?

A That's the total cost, Mr. Everett, for ourselves and others.

Q Yourselves and others.

A As a matter of fact, throughout, so you won't have to ask it any more, it's always ourselves and others in practically every instance.

Q You talk about on page 6, your liquids production being 20 percent higher than 1959, and "Our Company's improvement is gratifying, especially in the face of a 1960 national average of approximately a one-half per cent decline in crude production and a six per cent increase in natural gas liquids production."

Then the next paragraph, you say, "Part of the increase in liquids production may be credited to our 42% increase in natural gas production over 1959," then give the total and refer to the \$2.25 and \$2.45 per barrel, and then you say that: "Net producing gas well interests increased by 7.197 during fiscal 1960."

A Yes, that's working interest wells, once again.

Q That's working interest wells?

A And that would be approximately a third, as I have



stated in the past, of the wells drilled.

Q Then on page 6, how many wells, how many actual wells, if you remember, did you have at that time, Mr. Trueblood?

A I wouldn't have the vaguest idea. I now have 2900, so I don't know what I had then.

Q Well, you say this: "At this time, Consolidated had varying interests in almost 10% of all Dakota wells in this portion of New Mexico."

A At that time, Mr. Everett, in 1960, we were still being sort of the bellwether in the Basin-Dakota formation, and there were very few wells that had been drilled and completed to the Basin-Dakota formation. For example, 160, I believe, or 207 or something on that order was all that had been drilled by the time El Paso made their investigation at about the time this report was written.

Q You state in your next paragraph, "Proration, or State regulated limitation of production, will commence around February 1, 1961, for the Dakota formation in New Mexico. This regulation has been in effect for other oil and gas producing formations for several years."

"The consequence of proration on Consolidated's natural gas interests in this area is one of balance between realizable income and productive well life."

"Consolidated has long-term gas sales contracts with El Paso Natural Gas Company and Southern Union Gas Company,



operators of gas transmission lines. These contracts contain escalation clauses which provide for periodic increases in prices received by Consolidated for its gas. Equally important is the 'take-or-pay' proviso which generally assures our Company of payment for a minimum of fifty per cent of a well's annual potential deliverability into the line."

"Proration reduces possible gas sales from 100% of a well's capacity, but allows each well a ratable portion of the total available market for natural gas."

Then I underline and stress this sentence because it seems to me that is almost in direct conflict with what you were complaining about this morning, as I understood, and that is the long payout:

"Offsetting the possible annual decrease in total income from gas sales is a 25-35% extension of the productive life of the wells. Here again, a balance is achieved between over-all income from higher volume gas sales at near term prices or equivalent total gas sales over a longer term with escalating prices."

"An important aspect of Consolidated's growth base is the accuracy with which natural gas income may be forecast. This has proven to be a significant factor in receiving expansion and development loan assistance from financial institutions."

Do you have any comment to make with reference to that?

A I certainly do, and that is, at the time that I made that projection, I had hoped that the Commission would adopt a



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proration formula or an allocation formula that would be a realistic one and would recognize the economic problems of the individual operator. I don't believe anybody, at the time that this was written, had any idea as to what the significance of a 25 percent acreage factor and a 75 percent deliverability factor would in fact do to the Basin-Dakota, but we sure know it now after the fact, fourteen months later.

Q As a matter of fact, did the Commission have a hearing in October of '60, prior to the time that this report was written?

A That's actually true, and that's the reason we said that it would be adopted on February 1st.

Q Didn't they actually adopt that order in November prior to November 30th, to be effective February 1st, so that you either knew or could have known what that formula was to be, as of the time you wrote this report?

A That is correct. But at the time I didn't know the nominations of the pipeline, and the other thing I didn't know was how many wells were going to be developed.

Q You state in your forecast for 1961 -- and I don't know whether you are referring to Dakota-Mesaverde or Dakota-Pictured Cliffs, or what, but possibly you can tell me, page 11 of your report: "With twenty-five proven undrilled 320-acre Dakota gas units, a successful drilling program for 1961 is assured . . . several wells will be dual zone completions, either as Dakota-Mesaverde or Dakota-Pictured Cliffs gas wells . . . the Company's



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interest in these wells should approximate sixteen net wells. . . . completing development of the remaining proven undeveloped gas reserves."

Do you have any comment with reference to that?

A Well, actually, other than the fact that we drilled twenty of the twenty that I mentioned in 1961, we did drill twenty for twenty, and by the end of 1961 still had varying kinds of locations to the extent of twenty-eight, I believe, locations by the end of 1961. I might also say that we were very fortunate in having several dual zone producers, or we would really be having problems in being able to stay in the San Juan Basin at this time.

Q I hand you this instrument and ask you to tell me what it is, please.

A This is the 1961 Consolidated Oil and Gas, Inc., Annual Report for the fiscal year ended November 30, 1961.

MR. EVERETT: I ask the reporter to mark that Ohio Exhibit D for identification.

(Whereupon, Ohio's Exhibit No. D marked for identification.)

MR. PORTER: What was the exact date of the previous report?

MR. EVERETT: The previous report was written November 30th for the year 1960. It's dated January 28, 1961, but covers the period up to November 30, 1960.

Q (By Mr. Everett) Is that correct, Mr. Trueblood?



A That is correct.

MR. EVERETT: It shows on page 2 the date of the report and page 1 the covering.

(By Mr. Everett) Referring back to the 1960 report for a moment, there's a note to financial statements, Mr. Trueblood, which appeared apparently on a financial statement on an unnumbered page by Mr. W. L. Clasquin, an accountant, I assume, dated January 11, 1960. He says: "During the fiscal year 1958, the Company sold a \$440,000.00 gas payment for \$340,000.00 to be repaid out of the proceeds of production from certain gas properties. At the time of sale, the Company management estimated that it would take approximately seven years to recover the \$440,000.00. The \$340,000.00 has been considered deferred income and as the gas is actually produced that amount will be taken into earned income. As of November 30, 1960, there was a deferred income balance on this gas payment of \$252,812.77."

Then, without reading it in detail, the next paragraph describes during the fiscal year ended November 30, 1959, the Company sold another oil and gas payment for \$220,000.00 plus an amount equal to six and a half percent of the unpaid balance to be paid out of production from certain oil and gas properties; refers to another sale on September 23, 1960, of \$580,000.00, to increase that payment to \$800,000.00, and the Company estimated it would take five years to recover the \$800,000.00 plus the six and a half percent, and then this rather significant statement:



"The consideration of \$800,000.00 was received in the form of \$565,000.00 cash and an installment note for \$235,000.00 of which \$90,000.00 is payable on or before February 1, 1961, \$70,000.00 on or before April 1, 1961, and \$75,000.00 on or before April 1, 1964. As of November 30, 1960, there was a deferred income balance on this oil and gas payment of \$796,724.92."

Can you tell us, Mr. Trueblood, the exact nature of these production payments? Does that money, has it already been received by your company, and the production from any of these gas properties assigned to discharge it, or is it the other way around?

A Oh, actually, for tax purposes, in order to prevent a loss carried forward, Mr. Everett, from expiring with the cash out, under ABC method, you can sell future income plus, for the most part, a growth factor of six and a half percent, which is a non-resource loan or a non-resource sale from specified interests in oil and gas properties, retaining enough division order interest in each of the wells to pay, or to pay for our own operating costs for our specific interests, which places the obligation on our books in a long-term category and in a non-resource category, in lieu of issuing bonds or debentures or what have you, such as Ohio or El Paso might do.

This has been a continuing method of ours and you'll find it to be true in the 1961; you'll also find it to be true if we are sitting in here again in 1962.



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Q But it has a definite due date in which that payment must be made?

A Absolutely not. We are carrying out and selling an economic reserve in the ground, plus a growth factor of six and a half percent; and at the time we made an estimation of how many years of future revenues we are selling. It's based on the information at the time; for example, under 1960 allowable we thought we sold a five-year payment; projecting the same interest on the same wells in 1962, we sold a ten-year payment.

Q Well, that means for whatever period it takes to pay off -- let me put my question another way. When you sell these production payments, you sell a \$440,000.00 payment, for which you receive three hundred --

A We received three forty in that instance, in lieu of a growth factor in that particular instance. The other ones, we continued to add to and amend.

Q All right. The income to your Consolidated working interest in these wells, what percentage of that income goes to discharge this production payment?

A Around 75 percent.

Q So that if Consolidated and its associates owns 75 percent of the working interest in a given lease, then 75 percent of what you and the other working interest owns, do they join in it?

A No, no, they do not join in it. They don't have the same problem of losing tax carry forwards as we do. To put it



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another way --

Q In other words, if you have 75 percent of the income from the property --

A To put it another way, it's this simple --

Q Please explain it.

A It's this simple. It's nothing more than a straight bank loan on production, except in this instance it's non-resource.

Q Meaning there is no personal liability on the company?

A On the corporation.

Q What I would like to know, and for the Commission to know, is what percentage of the income, after meeting these production payments and so forth, is left for Consolidated to pay its operating expenses out of?

A Approximately 25 percent of the interest we own.

Q Twenty-five percent of the interest you own?

A In other words, if we owned 36 percent division order interest, we might assign a 28 or a 27 percent division order interest specifically, specific 27 percent division order interest in a well, and another one we may have 60 percent, and another one ten, with whatever our varying interests are; so we try to retain 25 percent for working capital.

Q So your operating expense remains fairly constant, is that a fact?

A Operating expense remains fairly constant? Percentage-wise, no, it doesn't, because frankly the 1960 Annual Report



there that you showed, we had a potential into the line capacity of twelve million cubic feet, at which in November, as I recall offhand, we had reached an actual sales capacity of five million cubic feet. I might say that it's taken us twenty more wells and one year later under the existing formula to get back to the same six million cubic feet; and now we have a potential of about twenty million cubic feet a day.

Q You are looking at it from the standpoint of income, then, to the company, rather than correlative rights; and you measure it by income instead of by the factors which the Commission must give attention to, which is acreage, porosity, permeability, and other pertinent factors?

A I don't know what you are asking, Mr. Everett.

Q I think it's apparent from the report, Mr. Trueblood, if you don't understand my question I'm sorry. Now let's go on with this Ohio Exhibit D, which is your '61 report. I'm not going to make but a few references here. This report is for the fiscal year ending November 30, 1961. To start off with, and to show that you did give considerable attention to reserves, you stated: "Natural gas reserves rose 26%, giving the company net proven reserves of 152 billion cubic feet at year's end. Crude oil and condensate reserves at the same time were 2.413 million barrels -- an increase of 24 percent."

"Consolidated participated in the drilling of 20 wells during fiscal 1961, for a success ratio of 100%!"



Then your letter which is addressed to the shareholders is not dated, but I assume that it was written sometime after November 30, 1961?

A Sometime in December.

Q The accountant's report is dated January 17, 1962.

Then you say in this report, referring to page 3, "Drilling activities were limited to development of the Company's proved gas reserves which resulted in a 100% success ratio of twenty gas wells completed out of twenty wells drilled, inclusive of ten dual zone gas producers."

Then you go on and tell the stockholders that: "...the dollar cost of assets of Consolidated rose 56% during 1961, but when considered in the light of the value of new reserves added, the assets again almost doubled for the fourth consecutive year."

Then you talk about the adverse factors which you had, one of them was, for the first quarter of the fiscal year you had "practically no development drilling due to the Midland Oil Company merger which required the attention of all available personnel. This lack of development necessary delayed new well hookups, and gas sales were reduced accordingly during the year. Another adverse factor which tended to reduce the percentage increase in sales was the instigation of Dakota gas proration in the San Juan Basin on February 1, 1961. This proration reduced gas sales to approximately two-thirds of that previously forecast for 1961."



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I assume that is still correct, is that right?

A You mean --

Q The statement that you make here that the proration reduced your sales approximately two-thirds?

A For that year, yes.

Q For that year.

A Of our projected.

Q In other words, you made a bad guess the year before, is that correct?

A Well, we merely made our guess for '61 based on our '60 sales, and assumed that they would be approximately the same under the proration formula once it was tried; and to our shock and amazement, it didn't work out to be that. It was thirty percent less.

Q Well, I'll let the report speak for itself. And the balance of that part, you state that: "Over 90% of Consolidated's developed and producing gas reserves are located in the San Juan Basin of New Mexico where severe marketing restrictions are imposed." Is that situation still the same today?

A It's worse today.

Q Worse today. So that as to the marketing restrictions, are you referring to the Commission order or are you referring to the lack of market provided by El Paso and Southern Union?

A I'm referring to the Commission order of allocation of the producible gas from the various wells in the San Juan



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Basin-Dakota Field.

Q Well, then you go on and say, "Purchasers must take, or pay for, a specified minimum amount of gas each year from each specific group of wells." Your purchasers have to pay you for so much gas whether they take it or not, is that what I understand?

A Well, we have been led down the primrose path to think that this was possibly true. However, we have been advised by counsel in recent times that by the time we ever prove this in a court of law, that probably it wouldn't make any difference anyway. So I must admit that in future Annual Reports I'll refrain from mentioning "take-or-pay" clauses.

Q Then you state, as you've already testified, that: "Purchasers must grant price escalations each five years, one of which became effective two years ago after being readily approved by the Federal Power Commission." Then this statement: "Purchasers must recognize a 'favored nations' proviso which assures an automatic increase in sales price commensurate with better prices which any buyer might have approved for the purchase of gas from other operators in the San Juan Basin."

Did you discuss that last statement with your counsel before you wrote this report?

A No, I did not discuss it with him before I wrote that report. All I can do is rely on the fact that it is included in our contract, and that apparently, from my dealings with the various transmission companies, they are super-sensitive in making

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any general change for the benefit of others, because they must have some idea that the "favored nations" clause might be triggered and everybody would be in the soup.

Q Do you know, or do you not know, or did your counsel ever advise you that the "favored nations" clauses have been ruled out by the FPC?

A Actually, in our instance, since sixty percent of our wells are intrastate wells, it's no concern of ours, with respect to those wells, what the Federal Power Commission does at this time.

Q Did you or did you not know that the Federal Power Commission had ruled out "favored nations" clauses?

A Oh, on new contracts, yes. I was aware of that.

Q Have you had any instance in which the price increase had been granted solely upon the basis of a "favored nations" clause?

A No, but I'm familiar to a little extent, strictly from hearsay, that contracts have been negotiated and eliminated these "favored nations" clauses, and at the same time the contracts were re-negotiated, the prices that would have been prevalent had the "favored nations" been in effect were placed in effect at that time, with the elimination at the same time of the "favored nations" proviso.

Q Now this was in January or February of '62 that this report was released; it was for the year 1961, ending November 30,



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and you state this, which seems to me to be exactly contrary to your testimony this morning where, in effect, you were telling the Commission, "My company's not going to spend any more money in New Mexico if this formula stays in effect." Here is what you told the stockholders: "Management is convinced that the long range gas marketing picture is excellent; it is only necessary to weather the current period of restriction."

Do you have any comment with reference to that statement?

A I absolutely believe this, and I believe it even now or we wouldn't have drilled the wells we drilled. However, the wells we drilled in the recent months have all been dual zoned wells, because we can't drill single Dakota wells under the existing formula unless it's to meet an obligation.

Q You are saying it would not be a prudent operation--or it would be a more prudent operation to dual a well than it is to drill one from the grass roots?

A No question about it.

Q So there again, that enters into the matter of your operations cost. When you dually complete a well to the Mesa-verde or Pictured Cliffs, and take it down to the Dakota, how do you allocate the cost of that well as between the two formations?

A We don't allocate between the two formations.

Q How do you determine your operation cost, then?



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A The operation cost is merely taken on as the well itself totally produces, and total cost to operate without regard to zone.

Q Your testimony to wells being uneconomic in the Dakota this morning did not refer to the Dakota; it referred to the Dakota and Mesaverde or Pictured Cliffs?

A No, that is not true. I was speaking only of the Dakota formation, because we have a number of single zone wells which we drilled relying on 1959 and 1960 sales, which we now have found suddenly to be uneconomic as a result of this order.

Q That's your conclusion. When you state in this report: "The development of new reserves and capacity from these new wells was enhanced by the fact that ten wells were dual-zone completions. These dual-zone wells develop essentially twice the capacity and reserves with only about 10% additional expenditure for any one well."

Does that statement apply to your testimony this morning?

A It absolutely does.

Q So that if you have a well that is dually completed, it's your position that it becomes uneconomic in the Dakota because of this order?

A As a matter of fact, the only reason we could drill to the Dakota formation under this existing order at all is that we do have a Mesaverde deliverability to go along with it, so that



we could possibly have a ten-year payout.

Q Then you state: "As a result of this intensified development of proven gas reserves during 1961, the company's capacity for daily net gas production was increased approximately 65%." I take it your complaint today is that you are not getting to produce that sixty-five percent of capacity?

A Oh, no, our complaint at this time, today, is one in which we would like for the market, total market to be higher so that we weren't operating at thirty-five percent of the end-of-the-line potential. Our main complaint today is that we desire to stay, as I stated, first, to stay in the San Juan Basin and further develop wells, if wells are placed in an economic category. That is our primary concern. We have to live with what we have.

Q Well, that brings us to your 1962 Forecast. I think you testified, I believe, before counsel interrupted, that you had planned to and had taken over the Tekoil Corporation, is that correct?

A That is correct.

Q And in that you say that "at least six additional development oil wells are available. . . new waterflood operations may be instigated . . . new equipment for old waterflood projects should substantially increase production . . . new gas well development on Jonnell Gas Company properties should substantially increase developed gas reserves ..." -- Jonnell property, I believe, is in Texas, isn't it?

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A That is correct.

Q "... debt will be orderly retired by production from properties . . . probable secondary reserves should be changed into proven as a result of new development activities . . . gross sales should exceed \$4,000,000 . . . cash flow should increase to 80¢ or 90¢ per share . . ." Then this statement: "... net income will disappear as a result of Tekoil's very high depreciation and depletion rate." It seems to me, Mr. Trueblood, and possibly you can answer this in some some way, but I just don't quite understand your testimony this morning with your statement here that net income is going to disappear this year. I think it may be on account of your Tekoil acquisition rather than on account of, as you would describe it to the Commission, its order entered in this R-14760, whatever it is, 1670-C.

A Actually, Mr. Everett, I think that it would be well at this time to refresh the problem of a discussion of cash earnings and what they really mean to an oil company, as opposed to net earnings.

As you well know, Ohio Oil and El Paso and everybody else pays their debt with cash earnings, and they drill new wells with cash earnings and they develop properties with cash earnings, and the net income itself is of very little significance other than, once again, the public's favor or disfavor of the price of their stock as on the listed exchange.

MR. HOWELL: In lieu of a company that has operated for



many years as a public company on borrowed money -- I would like to have stricken from the record the assumption on which the witness states that the El Paso operates. It has nothing to do with the issues in this case.

MR. STOCKMAR: We have no objection to your sustaining the objection made by Mr. Howell; but I would like to say that some years ago in the Senate elevator in Washington, I encountered Senator Lehmann of New York. I even asked him how the filibuster was coming, and he said, "Young man, I am not engaged in a filibuster, I am educating the people."

Now if this program of interrogation of the witness is in aid of the education of the Commission, then by all means it should go on. If not, I respectfully request that it be terminated.

MR. PORTER: The reference to El Paso's operations, how they operate, will be stricken.

MR. EVERETT: If it would please counsel more, he can read this report, if he likes.

A Mr. Everett --

MR. EVERETT: I will not interrogate with reference to this one.

A May I interject one other thing that my counsel cut me off on. I think it's material on the acquisition this morning.

Q (By Mr. Everett) You ask him, not me. I ask the questions.

A On April 1st, and since the things that you are bringing



up here, we have since bought, 700,000 in cash for one, a hundred thousand shares of our stock, with the stock trading at four and a quarter on the American Exchange, and we have the funds with which to meet our obligations. If you want to proceed on that tack, go ahead, but we can be here for two weeks.

MR. PORTER: We'll take a ten minute break.

(Whereupon, a short recess was taken.)

MR. PORTER: The hearing will come to order, please.

Mr. Everett.

Q (By Mr. Everett) Mr. Trueblood, I hand you a letter and ask you to identify it, please.

A This is a letter addressed to the shareholders of Consolidated Oil and Gas, dated January 18, 1962, in which we gave notice to our shareholders of a proposed merger of Tekoil Corporation into Consolidated Oil and Gas, and with which we transmitted a Proxy Statement which should have been filed under the requirements of the Securities Exchange Act of 1934, because we were a listed company, listed on the American Stock Exchange, and we were required to file a more formal Proxy Statement than is usually required.

MR. EVERETT: Will you mark this for identification as Ohio's Exhibit E?

(Whereupon, Ohio's Exhibit No. E marked for identification.)

(By Mr. Everett) I hand you this instrument and ask



you if this is a Notice of Special Meeting?

A This is a Notice of Special Meeting of Stockholders of Consolidated Oil and Gas, Inc., which is a Proxy Statement.

MR. EVERETT: Will you mark this for identification as Ohio's Exhibit F?

(Whereupon, Ohio's Exhibit No. F marked for identification.)

Q (By Mr. Everett) Referring to page 3 of Ohio Exhibit F, which is the Statement of Consolidated Oil and Gas Company, Inc., there is a note under the Capitalization, showing the debt and capitalization of Consolidated Oil and Gas, which refers to a number of items of indebtedness, including the following, and I'll hit them very briefly:

A note dated May 31, 1961, maturity January 31, 1964, with monthly installments of \$11,500.00, payable to Central Bank and Trust Company of Denver, in the amount of \$380,000.00, showing a balance of \$287,327.88 on 11-30-61, bearing 6 1/4 percent.

A note dated 2-28-61, payable to Mid-Continent Supply Company in 25 monthly installments of \$3,000.00, total amount of \$75,000.00, balance \$51,000.00 as of 11-30, bearing interest at 7 percent.

Note dated September 30, 1961, payable to Mid-Continent Supply Company in 30 monthly installments of \$2,000.00, total amount of \$60,000.00, reduced to \$56,000.00 at November 30, 1961, bearing interest at 6 1/2 percent.

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Note dated March 1, 1958, in the principal amount of \$14,266.76, payable to Mountain States Investment Company, payable over 30 years, reduced to \$13,147.07 as of November 30, 1961, 5 1/4 percent interest.

Note dated May 25, 1960, with maturity of 6-1-64, payable to California Bank, Los Angeles, California, in the principal amount of \$100,000.00, reduced to \$54,497.34 on November 30, 1961, payable in monthly installments with 6.5 percent interest.

Note dated October 10th, 1958, maturity date 5-1-62, payable to First National Bank, Farmington, New Mexico, in monthly installments, 6 percent interest, principal amount of \$5,700.00, reduced to \$1,352.36.

Note dated 7-3-61, payable to Western Pipe and Tube Company, maturity date 6-1-64, 6 percent interest, principal amount of \$30,000.00, reduced to \$27,499.90 on 11-30-61;

and some others that are listed there which I'm not going to read at this time, the record will be sufficient.

I would like to ask you this question, Mr. Trueblood, in connection with those note payments. Are they payable out of the 25 percent of the working interest, which I understand -- 25 percent of your interest which still remains and out of which you pay operating expenses?

A You mean from the gas properties, the answer is no. These are loans principally against our oil properties, with the Central Bank and Trust, with the United California Bank. The



loans with respect to payments to the Mid-Continent Supply Company and to Western Pipe and Tube are payments which are secured by production payments receivable, which we have purchased from certain of our drilling participants out of certain specific division order interests and certain wells that they had, in order to cure their particular tax problem in a given year. The other items are relatively incidental. They have to do with a house we own in Farmington which we would be most pleased to sell to anyone here, and a few other little odds and ends of that type.

Q It is a personal obligation of the company, is it?

A That is correct.

MR. EVERETT: I call the Commission's attention to the other financing arrangements which Consolidated has which appear commencing at page 29 of Exhibit F.

I offer Ohio Exhibits A through F in evidence, and ask permission of the Commission to withdraw them for the purpose of making copies and to substitute the copies in their place.

MR. PORTER: Any objection to the counsel's motion?

MR. STOCKMAR: If the Commission please, to the extent that counsel for Applicant has not already waived the admission of some of these, I do object in their entirety to the admission in evidence of these exhibits as irrelevant and not material to the proceedings at hand.

MR. PORTER: The Commission will admit the exhibits to the record, but will not consider anything which has to do with



the capital structure or the financing arrangements of Consolidated.

MR. STOCKMAR: I presume that the automatic exception to all rulings applies to the Applicant as well as the proponents. For the record, I would like to note an exception as to each adverse ruling.

MR. PORTER: Yes, sir.

MR. EVERETT: Well, I made a general submission or offer in evidence of these exhibits. I think the financial structure of the Applicant is indeed material to these proceedings, particularly when you consider their testimony, the witness' testimony in connection with payouts, with the economics, and what he calls the declaration that a well is uneconomic.

MR. PORTER: The Commission has already ruled on that, Mr. Everett.

MR. EVERETT: Thank you.

Q (By Mr. Everett) Mr. Trueblood, how many wells were drilled by Consolidated in the Basin-Dakota Pool in 1959, do you recall?

A We drilled twenty wells in the Basin -- I mean we drilled twenty wells in the Basin in 1959, as I recall. I don't know the number of Dakota wells. I do recall that we had three dry holes that year.

Q The next year I think your testimony was that you drilled twenty and all of them --



A No, twenty-three out of twenty-four the following year.

Q Twenty-three out of twenty-four the following year.

How many last year?

A Twenty out of twenty.

Q Twenty out of twenty. So that in rough numbers, that would make approximately sixty wells that your company's drilled in the Basin in the last three years?

A Yes.

Q Do you know how many wells were drilled by others in the Dakota formation, or completed in the Dakota during the same period of time?

A Well, basically, I know that there were 207 wells that were completed and tied into the Basin-Dakota pipeline system by September of 1960. I know that there were 507 participating wells in the Pool in February, 1960, proration schedule, which is some year and a half later. To that extent I'm familiar with the number of the wells.

Q Are you familiar with the ratable take law and rule of the Commission in effect in the Basin and elsewhere as to gas produced and gas producers?

A You mean from a legal standpoint, Mr. Everett?

Q I mean are you familiar with the fact that there is a ratable take law and rule in effect in New Mexico?

A I have been advised of that. I don't know the details of it. I'm not an attorney.



Q It's Rule 902, and the Commission, of course, would take notice of it. It provides, referring to Rule 902, that the purchases, if you have a common purchaser in a pool, that "Such purchases shall be made without unreasonable discrimination in favor of one producer against another in the price paid, the quantities purchased, the bases of measurement or the gas transportation facilities afforded for gas of like quantity, quality and pressure available from such wells."

Is it your contention that there has been any unreasonable discrimination in favor of one producer over another?

A Only insofar as the allocation formula as it exists today is concerned. That within itself, I think is discriminatory if it does not protect correlative rights.

Q Will you grant any exceptions to your statement? You have just testified that there were some sixty wells drilled by you, and the difference between two hundred some and five hundred some drilled in the last year or so, whether there was proration or not, Mr. Trueblood, isn't it a fact that the market that exists would have decreased as to Consolidated every time a new well was hooked into the line?

A No question about it, regardless of the formula.

Q So that you will grant an exception, then, that this discrimination does not exist solely on account of this proration order?

A Oh, yes, to that extent I would agree.



Q Isn't that a rather large extent, with that number of wells?

A Could you ask me --

Q Well, you had two hundred wells and now you have something in excess of five hundred.

A Oh, I'm quite aware of this and I had hoped, in my anticipated projection of living with the San Juan Basin as it existed in 1959 and 1960 and hoped to live with it in the future. My main concern is not for Consolidated as much at this time as for the participants who own varying interests in varying wells who have no protection against drainage under the existing formula.

MR. EVERETT: No further questions. Thank you, Mr. Trueblood.

MR. PORTER: Does anyone else have a question of the witness?

MR. HOWELL: Ben Howell, representing El Paso Natural Gas Company. If you don't mind, may I just retain this seat here-- I have a few papers here -- and question from this position rather than going up to the table?

MR. PORTER: That's fine, Mr. Howell, I believe you can be heard from back there.

BY MR. HOWELL:

Q Mr. Trueblood, in your opening argument this morning when you referred to the article in the Oil and Gas Journal, in which I believe you stated there was a loss in gas reserves in New



Mexico of 850 billion, what portion of the State did that loss occur in?

A Mr. Howell, I did not prepare the figures in question; therefore, I do not know the source.

Q Do you know whether that was in the San Juan Basin or in Southeastern New Mexico, or where it was?

A I presume --

Q No, I'm not asking your presumption. I'm just asking you a simple question. Do you know of your own knowledge where the loss occurred that you referred to this morning?

A No, I do not.

Q All right, sir. During the period of 1961, your testimony is that you drilled twenty wells. Were those the wells in which you were operator, or were some of the wells drilled by others?

A Some would have been drilled by others, but principally we were the operators in at least 75 percent of the cases.

Q Generally speaking, in the Basin, the working interest owner that owns the major portion acts as operator, when there's a joint interest well, isn't that right?

A That is correct.

Q So that as a rule you have drilled as operator most of the wells in which you and your associates together had the largest single interest?

A That is correct.

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Q Do you include in that twenty that were drilled last year any of these that Sunset International drilled in which you had a third carried interest?

A Well, actually it's a one-sixth carried; it's a third of their position.

Q Well, were any of their wells in that?

A One was drilled during 1961 and three were drilled in 1960, and prior to that time I believe that eight had been drilled.

Q Now you have some wells, now I believe you said numerous wells, waiting connection. How many are there in which you are the operator?

A I believe there's six.

Q As a matter of fact, of the wells of which you are the operator, you have six connected to El Paso's system as of the April proration, 1962, schedule, have you not?

A Seven.

Q I have here a copy of the April 1962 schedule showing your connections with the El Paso system. I'll ask you to count the wells that are connected.

A All right, I have got a Mesaverde well.

Q Six is the correct number of Dakota wells?

A Yes.

Q At the same time, the same month, your connections with Southern Union Gathering system of the wells in which you were operator totaled twenty-nine, did it not?



A I couldn't say.

Q Well, let's look at the schedule and see if it isn't. This one marked Southern Union, and the other one marked Southern Union Gathering.

A You have got me lost here, Mr. Howell. You will have to come back here. I don't think you have it paper-clipped properly. We are talking about the Basin-Dakota. You have me back in the Fulcher-Kutz Pool.

Q Right here is the Basin-Dakota Pool. Is it twenty-eight, and one on the Gathering?

A No, I counted twenty-seven.

Q Twenty-eight, you testify as to the number that is connected. Now you are also familiar with the fact, and I believe you testified that you were aware that El Paso did have an arrangement with Southern Union whereby it was taking rather large quantities to attempt to balance the wells connected with Southern Union's system so that they wouldn't fall behind their share of El Paso's market, isn't that right?

A It is my understanding that there is some balancing effect in order to create the ratable situation.

Q The ratable take, and that El Paso is actually taking into its system and sharing a part of its market with Southern Union?

A Insofar as the gathering system is concerned.

Q That's correct. Now, Mr. Trueblood, referring again



to this schedule, I find -- and if you'd like to look at it I'll show it to you, but I think I can just read it from here -- the deliverability of the wells you have attached to El Paso's system is as follows: 273 for the Clayton 1; the next well, no deliverability is shown; the Montoya has a deliverability of 73 -- and these figures, I understand, mean thousand cubic feet, is that correct?

A That's right.

Q The Haines Apache Northeast --

A Is not ours.

Q What is it?

A That's not ours.

Q It appears on the proration schedule -- I beg your pardon, Pan American State 1 was the one that had the deliverability of 73. No, Pan American had a deliverability of 126. Those deliverabilities are the correct deliverabilities of the wells that you have connected to the El Paso system?

A Yes, that is correct, because they are dual wells and we drill them primarily for Mesaverde production.

Q Now then, I'll ask you to check the figures, if you are not satisfied with them, but the addition of the wells in which you are operator shown on the Southern Union schedule, on the April proration schedule, shows an average of 662 MCF for the wells in which you are operating. Would that be approximately correct?



A I wouldn't have any specific idea, Mr. Howell.

Q Well, you wouldn't deny it, would you, that 662 represents the deliverability average of the wells in which you are operator, attached to the Southern Union system?

A Somewhere, I think it's somewhere in the range of 700,00, 750,000.

Q Now that's a substantially lower figure than this 1,591 that you gave as the average deliverability of your wells, isn't it?

A That is correct.

Q Now let's look at your model up here from which you took off a statement, this illustration and the testimony that you gave concerning it is based upon the assumption that each of these blocks has the same recoverable gas reserves in place, is that not correct?

A That is correct.

Q So that that illustration is appropriate only in the event there are the same recoverable gas reserves in place?

A Absolutely correct.

Q Now, I believe in your letter which was introduced by Ohio that your Executive Vice-President, and I assume you stand by his testimony, stated that the fracturing systems brought in additional lenses that weren't noticed the first time, when the hole was drilled, and prior to fracking, is that correct?

A I don't think it was lenses. I don't believe that was



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exactly it. I think that it was, that our production indications in the San Juan Basin of how to complete a Dakota well from the time in which we had originally drilled jointly with Ohio to a total depth and had had a minimum type of gas show natural, by drill stem test, from that period of time until a period of time some two years later we had found in other wells in the immediate area that we had been able to frac those wells; and at that time on the initial potential and initial deliverability, delivered deliverabilities on the order of anywhere from 800 MCFD to 1500 MCFD.

Q All right. Your Executive Vice-President stated that: "Subsequent experience in the area has pointed up two important factors: (1) If an effective frac can be accomplished, prolific production can be established from the Dakota in this area even in the face of zero natural flow: (2) Several Dakota sand stringers below our Owens penetration depth are productive." That second point, isn't that a lenticular string of formation that is brought in by fracking?

A As a matter of fact, we found out the very hard way that the lower lenses which we thought were going to be productive and were indicated to be productive on the electric log in this specific area of the San Juan Basin was an extra lens and turned out to be water-bearing, much to our dismay and to our subsequent cost in trying to shut off the water.

Q So in this statement, you do not ascribe today to the



statement that your Executive Vice-President made in 1959?

A On that specific well.

Q Now then, in determining this gross pay in there, you take in all characteristics of producing sands, do you not, in determining a gross pay thickness?

A That is right.

Q Now there's lots of differences, are there not, in the type and character of those sands when there's shale in there or when there's water in a formation, just as there was in here; or when there's a stringer that runs out in a short distance, those sands do not have the recoverable gas reserves that a good clean consecutive sand body has, do they?

A No, under the circumstances as you have set it out, they would not.

Q And there is variation throughout the San Juan Basin in the Dakota formation in the character of the sand itself, is that not true?

A That is correct.

Q It is your experience and you have seen others who have drilled a dry hole next to a pretty good producing well, on the offset location in the Dakota, isn't that true?

A In the San Juan Basin?

Q Yes, sir.

A A dry hole offsetting a producing well?

Q Yes.

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A What do you define as a dry hole, an economic failure or a completed and abandoned?

Q One in which the operator elects not to complete it.

A Well, once again this would depend upon the individual operator. Yes, I have seen cases where a specific operator elected not to complete a particular well and subsequently abandoned it.

Q When it would be an offset, a direct offset of a fairly good producing well?

A That is correct.

Q Now, Mr. Trueblood, I do want to compliment you particularly on one thing. As I recall, here in 1960 your position was exactly the same as it is today, that you opposed the 25 percent acreage, 75 percent deliverability times acreage factor. Is my memory right?

A That's correct, in that apparently I got in some few words stating our position, not being an attorney, and was subsequently admonished for it, but that is true, but I did make my statements well known.

Q Well, you haven't changed your position at all in the year and a half, have you, Mr. Trueblood?

A No, I have not.

Q So that in October, 1960, you at that time were opposed to this formula and are opposed to it today?

A That is correct.

Q Now then, in the intervening time you drilled twenty



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wells, in spite of the predictions which you made in October of 1960 as to the effect of this formula, did you not?

A Not fully realizing, or not fully knowing your nominations --

Q I am just asking, your company drilled the wells?

A Our company drilled the wells, ten of which were dual producers whose economics are different than single producers, five of which were shallower wells, and five of which, I believe, were single zone producers.

Q And you have some other wells that were drilled that are awaiting connection now; you have drilled some this year?

A That's correct.

Q How many have you drilled this year?

A For the most part, the wells that we have drilled this year have in every instance been a dual, a Mesaverde well or a Pictured Cliff well, with the exception of two wells which were required offset wells to then existing production.

Q You have drilled some wells --

A I believe we have drilled four dual zone Dakota-Mesaverde producers, one dual zone Dakota-Pictured Cliffs producer, and five Pictured Cliffs wells.

Q Now, I believe your testimony was that you came to the Basin in 1956, and between that time and 1960, the shallower formations were operating on the same 25 percent acreage, 75 percent deliverability formula, were they not?

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A That is correct.

Q And you were familiar with the operations of that formula in the other pools?

A That is correct.

Q You had some wells that were operating in those pools?

A Well, in the Mesaverde formation.

Q In the Mesaverde formation. Now you are also aware of the fact that there hasn't been any certification for additional market out of the San Juan Basin for a period of several years, aren't you?

A Yes, Mr. Howell, and this is, of course, in line with Mr. Everett's request as to my prediction in my Annual Reports, is that I kept hoping somewhere along the line that the FPC would become a little more generous to El Paso.

Q I assure you, Mr. Trueblood, that we share that desire. No one feels it to a greater extent than we do. Now this morning, were you in here this morning when the nominations were made?

A No, I wasn't.

Q If I were to tell you that the nominations of purchasers for April, 1962, were less than one percent different, insofar as the entire Northwest is concerned, than they were for 1961, would you be willing to accept that?

A From all formations, I presume?

Q That's correct.

A Certainly, if you make that statement I have no reason



to doubt it.

Q Also Mr. Utz' analysis showed that the nominations for the Dakota involved an increase of 28 percent. Would you be willing to accept that?

A I would love to accept it.

Q What is the effect of transferring 28 percent of the market to the Dakota from the other pools in the San Juan Basin?

A It obviously is going to reduce the allotted or allocated monthly proration for each of the other pools.

Q And will make the amount of market available for the wells in the Pictured Cliffs and the Mesaverde just that much poorer, is that right?

A That is correct, I would assume.

Q Now let's go to something else for a minute. Do you have your Exhibit 3 there?

A Yes, I have it.

Q Just look at it for a minute. We don't need to put it up, I think enough people have it. I believe there's a typographical error in the last column. Would you look at the heading of the last column on Exhibit 3? I think you show MCF per day.

A Yes, this same mistake was made all the way through Exhibit 2 and 3.

Q So the figure that's given there is a monthly figure rather than a daily figure?

A That is correct.



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Q According to your calculation in Exhibit 3, you take the lowest group of wells in the Dakota formation and you estimate their share of the allowable at some 7,980,000 cubic feet per month, is that approximately correct?

A That was taken specifically from the February --

Q From the February allowables?

A -- allowables.

Q Now rather than to get into fractions, because I got lost in them, for the purpose of illustrating the point let's assume that is close enough to an 8,000,000 per month allowable that we'll just call it 8,000,000. What amount of money would that produce, using the figure that you showed in discussion with Mr. Everett as the working interest owner's share of the production after he pays the royalty and pays the override when he takes farm-outs? I believe he used 12 cents as a reasonably fair figure?

A Right. That would be \$1,000.00.

Q In the neighborhood of \$1,000.00 a month?

A That's right.

Q And so under the existing formula, according to your own calculations there, the lowest group of wells in the Dakota formation gets an allowable which permits, on a 75 percent net working interest basis, a return of close to \$1,000 a month to the operator?

A Are you saying that on a yearly basis, Mr. Howell? Is that what you are asking me?



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Q I'm asking you --

A Mr. Howell, the average --

Q -- if that would apply on a month?

A The average, historical, for 1961 --

Q Suppose you just answer my question. Let's go back through it and --

A The yearly allowable for 1,000,000 cubic foot well, that's the maximum, in 1961 was 114 million cubic feet, total.

Q Well, now, on the February, looking at the February and taking your figures there, am I correct in saying that shows a thousand, practically \$1,000.00 a month income during that month for the lowest group of wells in the Dakota?

A That is correct, for that specific month.

Q All right. Do you know any other pool or field in the San Juan Basin that did as well as that, in which the lowest group of wells averaged as well as that?

A Well, actually, Mr. Howell, to answer your question, no, because the physical characteristics are entirely different, capacity-wise.

Q One other question and then I'm finished. Your Exhibit 3 and your Exhibit 4 were based entirely, were they not, on grouping wells by deliverability? That is, you took well groups by deliverability and then drew some pictures resulting from that?

A We attempted to establish in Exhibit 4, we attempted to establish the average of the average deliverability below what was



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going on. In other words, we had taken your chart and had compared it to February in the range of below and above average deliverabilities. We at that time took the average of 1404, which was then in existence, split it down the middle and said that a similar situation exists today and that the weighted average of your own work of the reserves, we didn't have the deliverabilities from which you worked, but of your own reserves below the average deliverability, our work indicated to us to be a weighted average reserve of approximately 3,000,000. We were attempting to establish --

Q You used as the reserve factor for each of those wells -- look on that exhibit for just a minute, Mr. Trueblood. What is the relationship between wells falling in the zero to one billion recoverable reserve bracket, as compared with these of the higher reserves? What's the ratio of difference in reserves?

A From this point --

Q Yes.

A -- of eight-tenths, to a --

Q Well, the average --

A You have got an odd point clear out here, but I would say the average variation would be from maximum, variation would be from eight-tenths on your work to 7.3. I don't know what you base your work on.

Q In other words, that would be approximately nine times --

A Well, I think the number --



Q -- versus the reserves; that's just a mathematical calculation, isn't it?

MR. PORTER: I think the record will be clearer if you don't interrupt each other.

Q (By Mr. Howell) That is just a mathematical calculation?

A That's correct.

Q So that that factor as shown by that study does have a variation to the extent of nine times --

A Yes, on your study it does.

Q I believe that your testimony, however, was to the effect that the maximum differences in reserves were three to one, did you so testify?

A That is correct, because in my testimony I eliminated these three odd points off here, and this nine billion, I don't know where you got that, I would like to know where that well is, I eliminated those two specific odd points and said that the ratio of one and a half to possibly as high as seven; however, you only have four points as high as seven million, and that if you weighted average this whole picture, the average reserve of the picture is 3.6 billion, and that the whole range of a deliverability well of 579, of the average deliverability of the wells underneath, and the 3,289,000 over in this side happened to fall in the three to five range, still speaking of averages.

Q I realize, now, let me see if I understand you correctly,



Mr. Trueblood. It's your position, as I understand it, that the Commission should disregard wells at the extremes in determining a factor that would apply to the major portion of the wells in the field?

A Well, based on the work that we've done, first of all, Mr. Howell, we would be further in, anyway. It is our contention and -- it is our contention that there is probably no more than a three to one variation in sand porosity, water saturation, all the different factors that go into making up the in place producible reserves.

Q In spite of the fact that studies have shown a variation as between as much as one billion and as much as nine billion in reserves, you still think that three to one would be the maximum?

A First of all, I don't know where this point came from. I have no idea of how it was arrived at. I don't ascribe to the fact that there's a nine billion cubic foot well in the San Juan Basin.

Q If evidence should show that to be the variation, then your three to one maximum would be out of line as to a well with a one billion reserve factor, and one with a nine billion reserve factor, wouldn't it?

A That is correct, on the work that you have done.

Q You have answered the question.

A All right.

Q Actually, Mr. Trueblood, whenever in one year 367 addi-



tional wells were drilled in a pool that at the beginning of the year had approximately 300, and there is no increase in the market, the only result can be to cut down the allowables for all the wells in the pool, is it not?

A That is correct.

MR. HOWELL: That's all. Thank you.

MR. PORTER: Anyone else have a question of the witness?

MR. SWANSON: Kenneth Swanson, representing Aztec Oil and Gas Company. With the Commission's permission, I will retain my seat. I think my cross examination will be short.

MR. PORTER: That will be permissible.

BY MR. SWANSON:

Q Mr. Trueblood, I would like to discuss a little bit a few areas that seem to me are ones that all of us express agreement in. That is, allowables should be tied as correctly as possible to reserves; I believe you have testified to that fact?

A Yes, sir.

Q And you are probably aware that the Commission was charged with allocating reserves or allocating allowables and protection of correlative rights; and has defined correlative rights as giving the operator an opportunity to produce the gas in place under his leases?

A That is correct.

Q Using his proportionate share of the reservoir energy. The formula that we have today uses a 75 percent deliverability



factor. Therefore, I think I would be correct in saying that today's allowables do vary almost directly with deliverability?

A That is correct.

Q Now, I'm going to direct your attention to your Exhibit 4, the El Paso curve.

A That is not an exhibit of ours. We just brought it up, it's in the Commission records. Our Exhibit 4 is this exhibit.

Q Well, we have discussed certain matters from this data that is shown on that chart. I believe you made a statement that you determined on the basis of the reserves that El Paso has developed there, that the average reserves of the wells then developed in the Dakota Pool were, I believe, 3.6 billion cubic feet. You've said that 70 percent of the wells fall below the average figure, and the average reserves for the below average wells is --

A Three billion.

Q -- three billion. You have also averaged the reserves above the average, and that figure I believe is five billion?

A That is correct.

Q Have you taken the same average procedure and applied it to deliverability shown on that chart?

A We have no access to deliverabilities, Mr. Swanson.

Q I mean the deliverability that is shown on the chart.

A We don't know in any one of these specific points, Mr. Swanson, what deliverabilities might be. In other words, a well in the 44 wells at this specific point, which happens to fall at



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the 3.4 billion range, we don't know that El Paso in their volumetric studies didn't take wells varying in deliverabilities all the way from three million down to a half a million, and group them in that point, at that specific deliverability point. We have no way of knowing that.

Q Well, as a matter of fact, we assume they did?

A We assume that whatever the two and a half billion or the three and a half billion groups of wells that they did volumetrically, that they averaged them all arithmetically and chose a point and put it in a plot of deliverability versus reserves.

Q Following the same procedure, they used to establish the average reserves for that particular plot?

A I'm sorry.

Q They used some procedure to weight the deliverability for perhaps the 34 wells --

A 44 here at three and a half billion.

Q 44. They will average the deliverability from those wells and they arrive at a point for it; they averaged the reserves for those wells and arrive at a value for it. That's the point that's represented by that point on the curve, is it not?

A No, no. I presume that they took all the wells that they studied and in a range of three to four billion cubic feet of reserves, and averaged those to arrive at approximately a three and a half billion cubic foot reserve figure; and I further presume that without regard to deliverability, that they made an arithmetic



average of all the deliverabilities on those same 44 wells and arrived at an average deliverability and placed that point on the chart. They seem to have been consistent every half billion cubic feet. They have here mainly between five and a half billion, eleven wells, and one and a half billion, twenty-two wells, constitutes by far the majority of their study. The is the range of, one and a half billion to five and a half billion range,

Q Well, as I understand, what they probably tried to do and I may be incorrect, but I believe you have used the exhibit to show something about average reserves, the range from three plus.

A Well, we merely, to answer your question and to refresh you, we merely took their work to see if it might be applicable to the reservoir as it appeared today as far as above average and below average deliverability wells. From their work it was indicated, with a 1225 average deliverability of the 209 wells available during their study period, and they had 160 wells in study, that there was approximately 3.6 billion cubic feet of gas in an average well, of the wells studied; and from that point we checked it against the position as it appears today and we said that a 1404 average deliverability factor happens to fall on their work at 3.8 billion cubic feet.

Q The point of my question --

A We then averaged all wells below, in order to determine a weighted average reserve of all wells below an average deliver-



ability and a weighted average reserve of all wells above an average deliverability, not having access to their deliverability.

Q My question to you was, have you also applied the weighted average procedure to the deliverabilities that are represented on that curve, and I believe you answered you have not?

A We have no way of knowing it.

Q You have not done that?

A We have no way of doing it.

Q You applied it to the average figure for reserves, but you have not applied it to an average figure for deliverabilities?

A No way, because you might have a two million cubic foot deliverability well only, have three billion cubic feet of gas. We have no way of knowing where this situation of a high deliverability well is, and even El Paso's calculation is a low reserve figure.

Q But we're dealing only with averages here?

A That's right. We are trying to establish -- we tried to establish an average picture that the Basin as a whole appeared.

Q For that purpose you have shown the Commission from the average on that chart that the average range and above and below an average figure, as far as the average reserves, is three billion to five billion. I think you said 60 percent of the high, a 60 percent spread?

A 1.6 more than the other.

Q Without asking you again whether you have done it, would you be apprised that during the recess I calculated on the weighted



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average procedure the average deliverabilities represented by those points, and came up with figures for average well below the average of 910 MCF, and calculated the average deliverabilities for the wells represented above the average figure and came up with an MCF of 1660. Now the low figure there of the wells below average is 54 percent of the figure for the wells above the average. It seems to me that using the method you wished to use to show the Commission that the reserves was only 60 percent will also show the range of deliverabilities is only 54 percent.

A Well, Mr. Swanson, I don't know how you established the deliverabilities without having the points that are spread up and down in any one of these points what the average deliverabilities were, but we went to -- but we did go to the specific average deliverability in all the wells available at the time, which was 1225. This was the actual in existence in September when their study was available, and we felt this was as accurate as we can possibly come up with.

Q My point is, if that information demonstrates that the average reserves vary from three billion to five billion, it also demonstrates that average deliverabilities vary from 910 to 1960. We have the same relationship to deliverability and reserves, and it seems that the allowable tied directly to deliverabilities is well within the range.

MR. KELLAHIN: For Southern Union, I want to make an objection to this line of questioning. It's argumentative, it's



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in the form of testimony in statements by counsel, and is not a question directed to the witness. I ask that it be stricken from the record.

MR. SWANSON: If the same analysis has been made of the chart in all respects, why, it could have been possible for Consolidated to come forward with this evidence. All I'm attempting to show is that he has used this chart to demonstrate a relationship. The same relationship is apparent from the evidence that he has placed before the Commission to show the facts that we have been discussing.

MR. KELLAHIN: The witness has testified that on the basis of the information on El Paso's exhibit, he cannot determine what the deliverabilities are in any individual point. If Aztec can do so, it would be incumbent on them to produce a witness and put him on the stand and make him subject to cross examination as to how he arrived at those figures. The statement of counsel as to what was done is certainly not subject to cross examination and we object to it.

MR. PORTER: The Commission will sustain the objection, and that portion of Mr. Swanson's statement which has to do with calculations of the average reserves here which he did will be stricken; and if he desires to develop that on direct testimony, he may do so.

MR. SWANSON: Thank you.

Q (By Mr. Swanson) Mr. Trueblood, may I explore a little

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bit the method by which you came up with the weighted average for your wells above the average and the wells below the average value insofar as reserves are concerned?

A We took the number of wells on each specific point times the reserves given that well, averaged all of those up on a strictly weighted average basis, took an arithmetic average of the wells so determined, and found that it approximated three billion cubic feet.

Q Did you take the values shown -- I believe the first point, the lowest value represents three wells with deliverabilities somewhere in the neighborhood of 200,000 and reserves less than a billion, is that correct? It's hard to see from here.

A Well, this point is three.

Q Yes.

A All wells were considered in this instance.

Q Did you go to El Paso's information on each of those three wells and make your study from the separate well?

A We made no study whatsoever on El Paso's work.

Q You have used the information that we're referring to here on the board?

A We only referred to this exhibit which was introduced in the original hearing as a source of a type of relationship of deliverability versus reserves.

Q Thank you.

A A published source.



Q You have established your average from the information that's on the El Paso chart?

A That is correct.

MR. SWANSON: Thank you. No further questions.

MR. PORTER: Anyone else have a question?

MR. STOCKMAR: Does the Staff have any questions?

MR. PORTER: There is no indication that the Staff has any questions. Would you like to ask some questions on re-direct?

MR. STOCKMAR: I would like to ask two or three questions, yes, sir.

REDIRECT EXAMINATION

BY MR. STOCKMAR:

Q Mr. Trueblood, should the order of this Commission be based on a recognition of the extreme cases of deliverabilities, high or low, that appear occasionally, or on the vast majority of the wells in the reservoir?

A The vast majority of the wells in the reservoir, or the average consideration.

Q Mr. Trueblood, with respect to your testimony on the general economics with respect to wells that you called commercial failures, was your testimony made on a general basis in terms of accepted standards and values in the industry, that is, without express recognition of your own financing problems, your own overriding royalty burdens; or did you, were you referring to your own



position in your own wells?

A We actually based our payout on economic considerations strictly on a payout based on \$90,000.00 of a well cost, and ten cents per MCF net price after deduction of royalties and operating costs consideration, whatever it might have been, and we attempted in our royalties to establish a pattern for the field as a whole, not for Consolidated Oil and Gas per se.

Q Mr. Trueblood, lest there be any false impression that you are here as a charitable venture and have nothing to gain or lose, would you once again summarize why you are here and why you think the order should be amended?

A Our first principal reason is that we would like to continue development of gas wells in the San Juan Basin; second of all, we have a problem and a very real problem of having a fortunate situation wherein our net interests in all the wells we have an interest in happens to fall above the average, contrary to whatever opinions might have arisen, that we have a real problem with respect to the protection of our various associates who do not necessarily appear in each well but in different wells; and that some of our associates are realizing extraordinarily fast payouts and others extremely slow to no payout whatsoever, which we believe can be brought more properly in focus with a change in the formula to the one requested.

In summary, we feel very strongly that we have watched a lot of the independent operators drop by the wayside in the San

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Juan Basin since we have been there, they are continuing to drop out, and we'll be amongst the casualties ourselves in the years to come unless we are able to protect ourselves in the form of protection of correlative rights; and finally, we have shied away in our basic policy decisions from any extensive further development in the Basin-Dakota without benefit of a second zone.

MR. STOCKMAR: That's all the questions I have. Thank you, Mr. Trueblood.

MR. PORTER: Does anyone else have a question? Mr. Everett.

MR. EVERETT: I would like to ask Mr. Trueblood one or two more questions.

RECROSS EXAMINATION

BY MR. EVERETT:

Q How do you define a commercial well from the standpoint of your company continuing to operate it? In other words, when would you abandon a well?

A When would I abandon a well?

Q Yes, sir.

A I would abandon a well when the operating costs exceeded the allowable sales, once I've already expended my funds in the first place.

Q In your operating costs, I think you testified this morning that you included an element of depreciation on what you call plant investment, is that right?



A Right. I believe we were discussing at the time net income.

Q Could be. I'm just wanting to relate that testimony, --

A I believe we were discussing net income.

Q --when Consolidated reaches the point of abandoning a well. You are generally familiar with the oil business, having been in it for a long time. As a matter of fact, isn't a commercial well considered to be one which will pay something to the operator over and above his actual cost of operation, which does not give any credit to plant account, to capital invested, to drilling costs, to casing, to all the other items which you have in there?

A That is correct.

Q You would not, then, I take it your testimony is that you would not abandon a well unless it got to the point where, excluding the capital items that we've mentioned, would not return to you more than your actual cost of having to go out and turn on a valve, and so on?

A That is correct.

MR. MORRIS: I have one question.

MR. PORTER: Mr. Morris.

BY MR. MORRIS:

Q Mr. Trueblood, along those same lines, could you tell me what the average operating cost on a Dakota well is for your company?



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A About \$150.00 a month.

Q That's for a single zone completion?

A That's right.

MR. MORRIS: Thank you.

MR. PORTER: Any further questions?

MR. EVERETT: Excuse me. Following Mr. Morris' question, I have another one.

BY MR. EVERETT:

Q I think you said your work was done on the field average rather than on Consolidated's work, with reference to cost?

A Right.

Q You used \$90,000.00 investment figure?

A Right. This takes into consideration wells anywhere from 8300 down to 5500 feet.

Q Yes. Well, we're talking about a Dakota well. And your testimony further was that you used a ten cent figure as the working interest income, ten cents per MCF working interest income from that type of well?

A We tried to be uniform throughout, regardless of the deliverability, so that we could establish a look at the various ranges of deliverability and the various ranges of payout; so rather than say it's eight cents for one deliverability well and twelve cents for another, or eleven cents, or whatever it might be, we tried to strike a field average and look at the field average position of any specific well.



Q In connection with the work you've done on the field average basis, do I understand this is your testimony, in effect: That your gross income from gas would be sixteen cents per MCF, from that you deduct an eighth royalty, or two cents, from that you deduct an eighth override or another two cents, and from that you deduct another two cents which represents the operating cost we're talking about?

A Right.

Q So that for your field average you used ten cents per MCF to take care of all your investment amortization and everything else out of the work interest?

A Not -- no, the two cents is merely the operating cost.

Q You use the ten cents, not the two cents?

A The two cent drop from twelve to ten is merely operating.

Q So that your cost is \$150.00 a month; as to your company, would you say that any well which produced less than --

A A million and a half cubic feet.

Q -- a million and a half cubic feet, then your costs are higher than the average cost which you used in the field?

A Right.

MR. EVERETT: That's all.

MR. STOCKMAR: I would like to ask one or two more questions because of Mr. Morris' questions, if I may.

REDIRECT EXAMINATION

BY MR. STOCKMAR:



Q Mr. Trueblood, if the order which you are requesting the Commission to grant were granted, would this result in any reduction of your average monthly operating costs?

A Would it --

Q Would operations under the order that you would like to have result in any reduction of operating costs?

A It would obviously lower operating costs with respect to the lower deliverability wells, and since it costs the same to operate a higher deliverability well, the fractional percentage change would be insignificant.

Q As to a well approaching abandonment, if the operating costs were lower under the order you ask, would this mean that more gas would be produced prior to abandonment?

A Absolutely.

Q Basically, is it your intention in behalf of your company to extract every cubic foot of gas that you conceivably can on an economic basis from this reservoir?

A This is the intent and policy of this company, to try to make a profit wherever the opportunity avails itself.

MR. STOCKMAR: That's all I have. Thank you very much, gentlemen, for your attention.

MR. PORTER: Does anyone else have a question of the witness? Mr. Utz.

RE CROSS EXAMINATION

BY MR. UTZ:



Q Mr. Trueblood, could you give us the average costs or your average cost of the single zone Dakota well completion?

A Mr. Utz, I would say it is on the order of \$90,000.00. We have wells varying from 8300 feet, and the shallowest are approximately 6200 feet. We do equip them quite elaborately with separators.

Q That figure includes separation equipment?

A That is correct.

MR. UTZ: That's all.

MR. PORTER: Anyone else have a question? The witness may be excused.

(Witness excused.)

MR. PORTER: We are going to recess the hearing until 9:00 o'clock tomorrow morning. It appears that at the rate we have been going today, we should finish by the 28th of the month by working Sunday.

The hearing is recessed until tomorrow morning at 9:00 o'clock.

(Whereupon, the hearing was recessed.)



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MORNING SESSION

April 19, 1962

MR. PORTER: The meeting will come to order, please.

We will continue with Case 2504. The Commission will recognize Mr. Kellahin.

MR. KELLAHIN: Jason Kellahin, representing Southern Union Gas Company. We will have two witnesses, the first one I would like to call is Mr. Oran Haseltine.

MR. PORTER: I believe he has already been sworn.

MR. KELLAHIN: That is correct.

ORAN HASELTINE

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A Oran Haseltine.

Q By whom are you employed and in what position, Mr. Haseltine?

A Southern Union Gas Company, Executive Assistant.

Q In connection with your duties as Executive Assistant for Southern Union Gas Company, have you anything to do with the Basin-Dakota Gas Pool in Northwestern New Mexico?

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A Yes, sir, that's one of our primary concerns.

Q Have you previously testified before the Oil Conservation Commission and had your qualifications made a matter of record?

A Yes, sir.

Q Have you ever worked in the San Juan Basin?

A Yes, sir, from the fall of 1958 until the early part of 1961.

Q Was that employment with Southern Union Gas Company?

A Right.

Q In connection with that, did you have anything to do with the Basin-Dakota Gas Pool?

A Right. That's during the early stages of development.

Q What was your position in connection with that?

A Drilling Superintendent and Production Superintendent.

Q Have you made a study of the Basin-Dakota Gas Pool?

A Yes, we have.

MR. KELLAHIN: Are the witness's qualifications acceptable?

MR. PORTER: Yes, they are.

(Whereupon, Southern Union's Exhibits 1 & 2 were marked for identification.)

Q (By Mr. Kellahin) I'll ask you, Mr. Haseltine, to refer to what has been marked as Southern Union's Exhibit No. 1.

A Let me put one of these up.



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Q Would you refer to what has been marked as Exhibit No. 1 and identify that exhibit, please?

A Our Exhibit No. 1 is a depiction of three cross sections taken through the San Juan Dakota-Basin Pool. These three cross sections vary in length from seven to fifteen miles and there are two particular things that we want to point out as being demonstrated by this exhibit. Cross section A-A¹, being some ten miles in length, shows, first of all, that the Basin-Dakota Pool is blanket and fairly uniform in its characteristics throughout. The Dakota log looks like a Dakota log no matter what end of the pool you are on.

Now, there are slow changes in some of these sand members. Some of them tend to become thinner and less well defined and others become more strongly developed, but none of these changes are rapid, and that's the first thing we want to point out from this exhibit. Any change in lithology or in sand thickness or porosity or any of the factors that go to determining reserves are slow changes throughout the Basin.

You take a cross section here fifteen miles long, certainly there are changes in the characteristics from this well over to this well, but they're slow changes, slowly occurring changes clear across the Basin; there are no rapid changes in stratigraphy or lithology on any sand thickness from location to location.



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The changes occur fairly slowly across the Basin, and in support of that, a geologist who is familiar with the Basin up there, once he has the elevation of his location, can pick the top within thirty feet, certainly, and our geologist claims that he can pick them within fifteen feet before it's drilled. So, when you drill to the Dakota you know where it's going to be and you know what it's going to look like.

The second thing that is shown in this exhibit is the extreme lack of uniformity in the deliverabilities, statutory deliverabilities that are given to each well. Now, then, on this exhibit the small numbers under each well log represents the statutory deliverability as reported to the Commission. The bar graph erected on each location is proportional to the size of that deliverability.

Now, then, the contrast comes here. You have a uniform Dakota formation changing slowly from one end of the Basin to the other, but you have an erratic spread of deliverabilities from location to location that in no way can be correlated with any of the subsurface information that is available to the operator.

We have picked some examples, a well that we have called here on the log A-7 has a statutory deliverability of 1,013 MCF, and the two offsetting locations are 90 to 100% above that. The logs are typical Dakota logs. There's no striking change in the logs



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from one location to the other. There's nothing subsurface-wise that you can put your finger on to show why that deliverability varies so widely, and certainly there's nothing that you can tie that range of deliverabilities there back to reserves and say that this well only has half the reserves under its 320-acre drilling unit as compared to the reserves under the two offsetting locations.

Take another example in through here where the wells are a little wider spread.

Q Would you identify the wells that you are pointing to?

A B-3 and B-2. From the looks of this they would be probably one mile apart. There should have been a well in here, and apparently it wasn't drilled. At least we didn't have the log on it. But B-3 shows a deliverability of 1919 MCF. B-2 shows deliverability of 8663, more than four times the deliverability of this well, and again, there's no way that you can support a range of reserves between those two locations of four to one.

Q Would you make a comparison between the C-3 and the C-4?

A The C-3 and C-4 are just outstanding examples of the same thing I'm talking about. C-4 has every bit as good section as C-3 and more section open and it has a deliverability of less



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than a million, and C-3 has a deliverability of thirteen million.

Q Is there anything, based upon the information available, which would indicate there were more reserves in one well than the other?

A Absolutely not. If anything, C-4, if a person didn't have the deliverability figures available, C-4 would be given more deliverability than C-3.

Q On the basis of the log?

A On the basis of any subsurface information available.

Q What accounts for the difference in the deliverabilities between these wells in your opinion?

A Well, none of us can be positive as to why, but the cores that we've seen, that I've seen, exhibit some recemented fractures, hairline fractures. Now, those recemented fractures probably don't contribute anything substantial to reserves or pore space because they are recemented, but if an operator is successful in cracking those recemented fractures open and propping them open, then he will have a high deliverability well. I think that the recemented fractures, the presence or absence of those determines to a large degree if a person is going to be successful in getting a high deliverability or low deliverability well.

Q Does that factor have anything to do with reserves in

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place under the tract dedicated to the well?

A The cores that I have seen, those recemented fractures represent such a small portion of the total volume, either pore space or total reserve, that they couldn't possibly contribute more than just, oh, 5% or less. Personally, I think it's less than 5%, but to be generous, they might contribute 5% to the pore space or the reserves.

Q But it would not account for nine times difference?

A It couldn't possibly account for it. If those fractures were open, if they contributed to pore space, they would contribute to the natural deliverability of these Dakota wells and everybody here knows that Dakota wells don't have much natural deliverability. It's a freak when you find one that will make much of a well without artificial fracking.

Q Then your completion practices govern the deliverability you are going to end up, is that correct?

A Completion practices plus whether you are fortunate or unfortunate in being drilled into some of those recemented fractures that will lend themselves to refracking, reopening.

Q Does the number of frack jobs on any given well change the deliverability of that well?

A Well, there again, you can never do the same well twice. Some operators think so, and I'm inclined to think that would



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probably lend to it. If you can go in and selectively frack and break down several different separate zones, it's logical that you will get a more effective fracturing on each one of those intervals.

Now, I think most operators have gone to about two stages of fracking, but some have gone to three and claimed that they derived benefits in initial deliverability from three frackings. I never heard anyone claim that he gained anything in reserves.

Q Does that complete your testimony with regard to Exhibit No. 1?

A Yes, sir.

Q Turning to what has been marked as Exhibit No. 2, would you identify that exhibit?

A Exhibit No. 2 is a map of the central portion of the Basin-Dakota Pool and we have drawn, first of all, on this map, the cross sections that we've referred to here. This is cross section A, starting from the southwest portion of 29, 11 and going in a northeasterly direction, and this cross section B down close to the Angel Peak area and then cross section C starts down in 27, 11 and goes northeasterly. On this cross section, or on this map of nine townships, we've spotted the Dakota development to date and we have put by each well its statutory deliverability as reported. One thing we want to notice there that I should

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have caught and didn't, the draftsman, where the proration schedule left the deliverability blank because it hadn't been reported, the draftsman marked that deliverability zero, but I'm sure that the well has some deliverability, so those zeros should have been blanks.

Then, in addition, in each township in the central figures we have shown the low deliverability in that township and the high deliverability, and in parenthesis below that the percentage that the high figure represents of the low figure. Once again, we recognize that there are differences in the Basin-Dakota Pool from one end to the other, there are good areas and there are poor areas, but one township probably represents around 2%, maybe 2% of the Dakota-Basin Pool, and in a given township the range of deliverabilities is far, far wider than the range of reserves that occur in that township simply because the Basin-Dakota doesn't change that rapidly in any of the characteristics that contribute to reserve calculations.

We could pick a few examples, here's a good one here. Well, first of all let me point out this, this is 29-11, which is probably average Dakota stuff. A range of almost 600% between the low and the high. Here in the Angel Peak, which is better than average for the Dakota, we still have a wide range of deliverabilities from 830 to almost 7,000, 819% difference in



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deliverabilities there in that one township.

Moving on down to 27-11 again, there's a range there from 196 MCF a day to almost 13,000 MCF, a change from low to high of 6,500 and 70%. To correlate that with reserves and make deliverabilities, a parameter of reserves would require a 65 to 1 range of reserves on those two wells.

Q Is there such a range in reserves on those two wells in your opinion?

A Couldn't possibly be.

Q What factor affecting reserves accounts for the difference in deliverability in your opinion, beyond the 5% you previously testified these small fractures might contribute?

A Well, where there is a little better sand development it's going to add a little to the deliverability. I don't think it's anything that we could measure quantitatively, but we couldn't deny it either, that if you have a little better sand development, why you should expect and get better difference; but taking the best sand development compared to the mediocre or poor sand developments, any of those wells have to be fracked to make a well at all.

Q In your opinion would a frack job have more effect on the deliverability of a well than the reserves would have?

A Yes.



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Q Have you any conclusions to draw from this testimony, Mr. Haseltine?

A Just to repeat briefly what we said, naturally, that two characteristics of the Basin-Dakota Pool are outstanding in considering the question that's before the Commission now. One is the slowly changing nature of the Dakota as you go across it. A Dakota log looks like a Dakota log, and when you drill one location you know about what the next location is going to look like.

The other thing to compare with that is the wide variation in deliverabilities from location to location that can't be supported by any subsurface information that's available.

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

A Yes, sir.

MR. KELLAHIN: At this time I would like to offer in evidence Exhibits 1 and 2.

MR. PORTER: Without objection the exhibits will be admitted.

MR. KELLAHIN: That concludes the direct examination of this witness.

MR. PORTER: Does anyone have a question of Mr. Haseltine?

MR. HOWELL: Ben Howell, representing El Paso Natural

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Gas Company.

CROSS EXAMINATION

BY MR. HOWELL:

Q Mr. Haseltine, would you say that in the Basin-Dakota Field, taking a township consisting of 36 sections and averaging the factors that are considered in making reservoir determinations would be a reasonable basis for determining the average factors applicable to that area?

A Well, if all you are after is average it would be, because that's what you are after.

Q Well, is taking an area such as a township to determine your average a reasonable means of doing it?

A It's reasonable if that's what you are trying to achieve. Now, you could average every Dakota well and you could say "This is the average Dakota well".

Q But you have already testified, have you not, that there are variances, I believe you said that the Angels Peak area is better than the others, that may be the sweet spot of the field, is that correct?

A I think so.

Q So that if one took the township around Angels Peak and took the average of the several factors that go into the reservoir, is that a reasonable method of determining average reserves in the

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Angels Peak area?

A Well, I would think that it would be a reasonable approach. I'm sure that any engineer that would do that would examine it as he went along to see if he wasn't getting himself into a corner by taking in something that shouldn't be there, some extreme condition, but as a general statement I think that that would be the place to start.

Q One does find very extreme conditions up in the Dakota Field, does not one?

A Yes.

Q Actually you know of your own knowledge of dry holes or wells that were plugged and abandoned that offset location of the producing wells, do you not?

A No, I can't name you a single direct offset Dakota to a producing Dakota. Now, there may be some, that was testified yesterday.

Q You wouldn't say there weren't any?

A Not to my knowledge there are or are not.

Q The characteristics of the Dakota formation in this Dakota Field, I believe you testified that there wouldn't be any wells at all that would be commercial without fracking?

A Well, I don't know that I said that. But I would say that there are very few, practically none.

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Q Well, you said you would have to frack every location to make a well, I believe is exactly your testimony.

A There may be exceptions, to my knowledge you would have to frack, right.

Q In your opinion, every well has to be fracked?

A I know of no exceptions personally.

Q Is not the purpose of fracking to make available to the well bore the gas that is in the formation?

A It's to make it available at a commercial rate.

Q If the gas that is in the formation does not become available to the well bore, that gas could not be considered as a recoverable gas reserve, could it?

A That's right.

Q So that the existence of fractures either made by nature or made by man in fracking a well, is the difference between reserves that may be in place and the reserves that are recoverable gas reserves, is that correct?

A Again, we have got to talk about what time we are talking about.

Q Well, let's talk about within the economic life of a field. I believe that we in the gas business have to talk to the Federal Power Commission on the basis of twelve years' reserves. Assuming that you are faced with that twelve-year period,

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would you not find a difference, a substantial difference between the reserves that exist in the rock and the recoverable gas reserves that are made available to the well bore by reason of these fractures?

A You sure would, right.

MR. HOWELL: I think that's all.

MR. PORTER: Mr. Morris, I believe you had a question.

MR. MORRIS: Yes.

BY MR. MORRIS:

Q Mr. Haseltine, I believe we're all interested here at this hearing to determine what formula will best allow each well in this pool to produce the equivalent of the recoverable gas under its proration unit. Now, based upon the information that you have presented to the Commission here on your exhibits this morning, what formula, what percentage of deliverability, if any, do you see would produce this ideal formula?

A Well, as long as we are dealing with only two parameters, acreage and deliverability, we'll never have an ideal formula. We have to be practical, though, and try to get some optimum formula that's going to come the closest to what we can work and live with. Based on what we have done here, we certainly need to decrease the emphasis on deliverability.

Now, how low we should go on that, I don't know. I'm certain

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in my own mind that to go to the 40-60 formula that's before the Commission now is just a step in the right direction. It's not far enough to be equitable, based on what I've seen in the Dakota Pool. But, how far we should go in that direction I just wouldn't try to say. Certainly farther than the 60-40.

Q Based on the information that you have presented this morning, would you recommend that any deliverability factor be included in the formula?

A Well, I wouldn't recommend eliminating something that would compare or give you a measure of the reserves in place. Now, then, we have to go farther than 100% acreage. We have to have something in there to relate it to reserves in place, and the Dakota Pool, unlike the shallower formations' deliverability, just isn't the parameter we're after if we're going to give it very much weight. There may be some other parameter that will work better than deliverability.

You take formation of units up in the San Juan Basin, there are other factors that are involved in trying to determine those correlative rights and those equity interests before a unit is finally consummated. And acreage is just one of those. Certainly acreage wouldn't be the whole picture here, but emphasis on deliverability I feel is the wrong way to go to supplement the acreage portion of the formula.

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Q You would agree that the inclusion of some deliverability factor would tend to give the operators an incentive to complete their wells in a more efficient manner?

A Right. And some of them have told me just exactly that as to why they use a three stage frack instead of two.

MR. STOCKMAR: Ted Stockmar for Consolidated Oil & Gas, if the Commission please.

BY MR. STOCKMAR:

Q Mr. Haseltine, you said that the producible reserves from any given well depended upon the gas available to the well bore. I think you responded to Mr. Howell that in a twelve-year period substantially more gas would be available to a high deliverability well than to a low deliverability well. Is it your opinion that this reservoir will be depleted or exhausted in twelve years?

A No, sir.

Q Do you have an estimate of the period of time within which it would be depleted?

A No, sir, I don't, but I don't think twelve years is anywhere near the life of the Dakota Pool.

Q Does not the lengthening of the time increase proportionately the amount of gas available to a particular well bore?

A Yes.



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Q Given enough time would not even a low deliverability well produce the reserves under its drainage area?

A I think so, and as long as none of us are going to try to change the spacing, why that's the thing we all admit one way or the other.

Q Mr. Haseltine, I think you said that one township was approximately 2% of the Basin-Dakota Pool. By my calculation this would mean that in your opinion there are approximately 3600 spacing units, that being 50 times 36 square miles, it would be 1800 square miles times two spacing units, that would be 3600 spacing units in the area that you are speaking of, is that correct?

A That's about right. I was just roughing out a figure of the 50 townships for the areal extent of the Basin-Dakota. I could be subject to correction on that, but I think we are in the neighborhood when we're talking that way.

Q That would equal 3600 spacing units?

A Yes.

Q Somewhere between five and six hundred completed wells, is this not the equivalent of fourteen, fifteen, sixteen percent development of the pool?

A Yes.

Q I think in response to someone's question you said that

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there was no variation in the basic characteristics of the reservoir that measure reserves as great as a nine to one variation, did you not say that?

A In commercially completed wells, that's right.

Q Do you have in mind some idea as to the degree of variation that does or can exist because of the characteristics that you can see from your log studies and other information available to you, omitting deliverability?

A Yes, I do, but if, with your permission and with counsel's permission, I'd like to defer that, I think our other witness will go into that in more detail.

MR. PORTER: Mr. Everett.

MR. EVERETT: Hume Everett, Ohio Oil Company.

BY MR. EVERETT:

Q Referring to your exhibits and your testimony with reference to the areal extent of the Basin-Dakota Pool, I think you said it was 50 townships and a township, if I recall, has 36 square miles in it. What would be the outside perimeter of the area in miles?

A I don't know. I'd have to measure it. It's kind of V-shape as far as the State of New Mexico is concerned.

Q But it's a very large pool, isn't it?

A Yes, it is.



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Q So that you have about 1700 square miles, I think it is 1500, 1700 square miles. Your testimony was that you thought there was about 50 townships, 36 square miles in a township, it comes out 1500. Now, your cross sections up there, A-A¹, I guess it's B-B¹ and C-C¹, how many miles is covered in your A-A¹, did you say ten miles?

A I believe that one is ten miles, yes.

Q And your B-B¹, how many miles in that?

A Seven, and C is fifteen miles.

Q And C is fifteen? A Yes, sir.

Q Then your Exhibit 2, you have nine townships?

A Yes.

Q And the work that you have done is all within this nine-township area?

A No, sir. That's just the work that I used to prepare exhibits.

Q Do you have a map showing the location in the Dakota of your cross section lines as to where those ten, seven, ten and fifteen mile areas are?

A Yes, sir, they are on this exhibit right here (indicating).

Q They are on Exhibit 2? A On Exhibit 2.

Q A-A¹, could you name the townships and ranges, 'I can't



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see them?

A A-A¹ begins in Section 31 of Township 29 North, Range 11 West, and ends in Section 10 of Township 29 North, 10 West. B-B¹ begins in 22 of 28, 11 and ends in 34 of 29, 10, and C-C¹ begins in 30 of 27, 11 and ends in 33 of 28, 9.

Q Do I understand your testimony to be that within the area shown on your Exhibit 2 that the Dakota formation is uniform in all characteristics under that nine township square area?

A No, sir. It's slowly changing, slowly changing.

Q How far is it from the upper left-hand corner in miles, that would be the corner of Range 11 West, Township 29 North, to the furthest point in the southeast corner of your map?

A Twenty-four miles.

Q Twenty-four-mile area there. And the total area shown in your Exhibit 2?

A Total area would be nine times 36 less one and a half tiers of section across this short township. It would be, oh, we could call it eighteen miles times sixteen, whatever that is.

Q That is an area eighteen miles by sixteen miles, and your testimony is that under that area the characteristics are the same in all respects?

MR. KELLAHIN: I object to counsel's stating, restating a statement that Mr. Haseltine has just denied he made.



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MR. EVERETT: No, he said it was excluded.

MR. KELLAHIN: He did not say that. He never said it.

MR. PORTER: Would you ask the witness what he did say?

MR. EVERETT: That's what I just asked him.

A I said it was slowly changing, that there are no rapid changes in lithology or stratigraphy or any of the factors that entered into the laying down of the sedimentary basin in the first place. The factors are slowly changing; sure, we could go to one end and we can go ten miles in the other direction and see differences, but they didn't occur in one location.

Q (By Mr. Everett) I think in answer to Mr. Howell you testified that to your knowledge you knew of no dry holes which were offset by producing wells?

A To my knowledge there are no Dakota dry holes offset by a Dakota producer, but it was testified yesterday that there were, so apparently my knowledge isn't complete.

Q Do you have any knowledge that there were any dry holes drilled any way in the Basin-Dakota Pool?

A Yes, sir. As a matter of fact, there is one, I believe it's right in here. I believe it was plugged and abandoned in 1955, but today from the looks of the log it would make a Dakota well.

Q But it was never produced?

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A In '55 fracturing was a new thing, particularly in respect to the Dakota, and the well was plugged and abandoned.

Q In your opinion, and based on the work that you have done, would you say that that well which was drilled in '55 which has never produced is entitled to the same amount of allocation as one of the best wells that you may have there?

A No. I don't believe that cemented hole is entitled to the same amount of allocation.

Q But you think it should have some allocation even though it can't produce?

A No, sir.

Q Well, what would you have the Commission do with that area when you get in the problem of acreage, your testimony, as I understand it, in answer to Mr. Morris --

A There's no well there.

Q There's no well there?

A A plugged and abandoned well, as far as the Commission is concerned, is no well.

Q But you would like for them in areas that haven't been drilled, the areas where there are no wells, you would like the Commission to give the same allocation that you give to the areas that have been drilled?

A No, sir.

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Q What would you have the Commission do?

A I think they are going to have to give allocation to completed wells as they have done in the past, and an undrilled well certainly will get no allocation.

Q As far as determining recoverable reserves, unless there's a well there, if I understand your testimony, unless there is a well there, you should give no consideration to the recoverable reserve just because it's under an acreage in an area?

A I will have to ask for that question over.

Q Well, I'll frame it a little differently. Let's look at your Exhibit 2. Are there some undrilled locations which are offset by producing wells?

A Yes, sir.

Q Would you indicate one of them?

A Well, when you get right here in the good part of it -- here is one right here.

Q Pointing to what?

A This looks like Section 23 of 28, 10, surrounded by Dakota that are capable anywhere from a deliverability of 2300 to 4700, offset on three sides.

Q Offset on three sides by drillable locations where there are no wells?

A By completed wells.



Q Where is this location that is not drilled?

A It would be the Southeast Quarter of that section, depending on which you were dedicating in halves.

Q Is it your position that the Commission should give the same weight to that undrilled location as it does to the surrounding offsetting wells?

MR. KELLAHIN: I object to this line of questioning. The witness has already testified that he does not think that the Commission should assign an allowable to anything but a completed well in accordance with its rules. Giving consideration to undrilled acreage has no bearing in this case.

MR. EVERETT: He's objecting to the Commission giving, and to the weight that's given to the recoverable reserves. We all know that you don't give a recoverable reserve to a tract unless it is drilled, Mr. Kellahin.

MR. KELLAHIN: He has so stated.

MR. PORTER: I think the objection is very well taken, Mr. Everett.

MR. EVERETT: All right, I will pursue a different line of questioning.

Q (By Mr. Everett) Is it your position that this situation, which is depicted by approximately 10% of the areal extent of the Basin-Dakota Pool, exists throughout the pool from north



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to south and east to west?

A I think it's representative of the two characteristics that we set about to demonstrate, the slowly changing nature of the Basin-Dakota on the one hand and the wide disparity of deliverabilities on the other hand, and to that extent it is characteristic of the entire Basin Pool.

Q It is characteristic of the entire Basin Pool. Let's take from one end of the pool to the other, I think you testified it's about thirty-six miles across here. From one end, the north end up in the La Plata area clear down to the most southerly producing part of that pool, do I understand that, your testimony to be that this is representative of that area which is something over a hundred miles, I don't know the exact distance?

A It's representative insofar as we are talking about those two characteristics.

Q That is, that the formation is uniform and changes slowly from well to well, do I understand your testimony?

A Changes slowly from location to location.

Q Between the upper northeast corner and the southwest corner of the productive part of the pool, is it or is it not a fact that there are many dry holes between that area that's separated by a hundred miles?

A Not to my knowledge.



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Q You know of no dry holes?

A I didn't say I didn't know of any. You said many. You asked me if there were many.

Q If the evidence shows there were dry holes in there, would that change your testimony any?

A I could be re-educated on any question, but to my knowledge of the Dakota-Basin Pool, and as far as I've looked at it over the past three or four years, I don't think that what you are talking about is in existence. I don't think that there are.

Q I think the evidence will so show, but I'm not going to argue with you.

A Okay.

Q These wells that you made the graph from, what basic information did you take to make your A-A¹, B-B¹, C-C¹ graph?

A The reason I chose these locations, first of all, this is right out of the central part of the Basin so it seemed a logical place to start. I didn't want to draw a picture of the whole pool. The reason I chose these particular locations instead of some other is because we had most of the logs in the files and only had to go out and buy two or three.

Q What kind of logs were they?

A The logs that were run on completion, electric logs and gamma ray neutron.

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Q Did you have any core analyses in any of the wells that were depicted on your Exhibit No. 1?

A No, if we did, I didn't look at them. I don't think there had been very much coring done on any of those wells, and probably none.

Q How can you tell from a log, or reach the conclusion that you have reached, that the formation will or will not give up gas to the well bore?

A Now, what's that again?

Q How can you tell from an electric log whether or not a given formation will give up gas to the well bore? What's the porosity, what's the permeability, what's the nature of the sand and so forth? Don't you have to take a sample or a cutting of that sand and have it analyzed in order to reach that conclusion?

A If you are talking about one well in a new area, one electric log or SP or one neutron curve might not give you much information, but in the Basin-Dakota where five hundred wells have been drilled and completed, one log tells you whether or not you are in the Dakota or what it looks like. You know what it looks like to start with. You don't need this other information. Operators just don't gather that kind of information on development wells.

Q How can you tell whether or not the Dakota formation is

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tight, whether gas will flow freely through it or the other things that are essential to determine whether or not that well is going to produce gas? Do you just guess that as an operator or don't you have some other measure that's better than the well log? You know the location of the formation, I won't argue with you about that.

A No, that's all you have when you decide to complete a well, all you have is the log, it tells you where to shoot and perforate and you go ahead and frack. There are Dakota wells that are up there that have been completed as good producers that the natural flow from those wells was too small to measure. The wells weren't cored, the wells weren't drill stem tested or anything else, all we had was the log, but they were successfully completed, that's all we needed, just the log.

Q You considered those wells all the same insofar as reserves are concerned, did I understand your testimony?

A All the same as what?

Q I said insofar as the reserves are concerned under the tract on which the well is located.

A No.

Q The recoverable reserves?

A No, reserves vary from well to well.

Q Based upon your measurement of the formation and the



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manner in which you completed the well, is that your testimony?

A Now what's that?

Q How do you determine your recoverable reserves in a given well? You say well to well. Let me have your calculation.

A As to how we determine --

Q Your ultimate recoverable reserves under a given tract on which a well is located.

A I think the best way, considering the lack of bottom hole fluid data that's available, in other words, the lack of bottom hole samples and the lack of cores that have been cut out of the section we're talking about, the best way to calculate reserves under any given tract right now is through a pressure decline history and pressure build-up data on that well.

Q Now, that requires production performance. Do you have such performance in connection with these wells shown on your graph?

A On some of these, and it's been presented before the Commission.

Q You think that would be the best, and how long a period would you have to have before you, as an engineer or professional man, would consider that production decline curve as the best method for measuring reserves, how long a period would you have to have that information before you would feel you were in a

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reasonable position to give an accurate estimate of recoverable reserves?

A Well, to actually make calculation of reserves, we feel that we can get a pretty good picture of it with one year's production history, but those calculations are subject to continual review and revision and personally maybe I shouldn't be saying this, but I don't quite see how this bears on what we're getting at.

Q The formula is based in part on recoverable reserves, and I think it's important for the Commission to know, and certainly I want to know how you arrived at your conclusion in making your recommendations that you have made.

A My conclusions and recommendations have been to decrease the emphasis on deliverability.

Q I understand that.

A As I told counsel for the Commission, I'm not prepared or not taking the position to say what parameter should be inserted in lieu of deliverability. I am just saying, and have concluded that deliverability does not deserve 75% emphasis in the formula, and I think should be actually lower than the 60, 40 that is asked for.

Q You have already told him that you wouldn't suggest anything, but are you suggesting that the Commission base this

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formula more on acreage and less on deliverability, is that correct?

A That's correct.

Q And it's your testimony that throughout the entire Basin covered by this vast area that the Dakota formation underlies has a very gradual variation from well to well throughout the entire Basin?

A Yes, sir.

MR. EVERETT: That's all.

MR. PORTER: Any further questions of the witness?

MR. HOWELL: If the Commission please, I would like to ask a few more. Ben Howell with El Paso Natural Gas.

BY MR. HOWELL:

Q Mr. Haseltine, in response to Mr. Stockmar's questioning, you stated that the life of the pool would exceed twelve years. Now, it is a fact, is it not, that there will be gas that never will come out of the rock in this pool?

A Yes, sir.

Q And that the gas which we're interested in is the gas which can be recovered and produced during the time that the wells and the pipeline system is available to transport gas?

A Yes, sir.

Q And it is also a fact that whether that period be

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twelve years, twenty-five years, thirty years, the difference between the capacity or ability of gas to move within one section to the well bore, and the lesser ability in other sections, will permit one section actually to produce and deliver a larger proportion of the gas in place, will it not?

A When you speak of sections, Mr. Howell, are you talking about a section of the formation or section of land?

Q I'm talking about an area in which the movement from the rock to the well bore is easy as compared to one in which such movement is difficult. Regardless of whether it be twelve years or thirty years, there will be differences in areas as to the percentage of gas in the rock that will be produced, will there not?

A I think so.

Q We might illustrate it this way, that when the Basin had only Indian trails, regardless of how much production of peaches there might be, you could only take a small amount out on Indian trails and then we got some wagon roads, you could take more out, and when you get highways and railroads you take a whole lot more out, is that correct?

A Yes, sir.

Q And that the fracking, the fracking of wells whether it be done off the formation, whether by nature or by man, permits



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over a given period of time a great deal more production to be taken from the area that has the highways than from the area that has the Indian trails?

A Yes, sir.

MR. HOWELL: Thank you.

MR. PORTER: Does anyone else have a question?

MR. KELLAHIN: Just one question.

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q In response to Mr. Howell's question you said fracking permits a great deal more production of the area. What area are you talking about when you agreed with him?

A It would have to be the drainage radius of the well, that that could be up to two miles, as demonstrated before to the Commission at an earlier time.

MR. PORTER: Anyone else have a question? The witness may be excused.

(Witness excused.)

MR. KELLAHIN: Mr. Porter, this witness has not been sworn.

A. M. WIEDEKEHR

called as a witness, testified as follows:

DIRECT EXAMINATION



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BY MR. KELLAHIN:

Q Will you state your name, please?

A A. M. Wiedekehr.

Q By whom are you employed and in what position?

A Southern Union Gas Company, Vice President in charge of exploration, gas supply, et cetera.

Q Now, Mr. Wiedekehr, you have previously testified before this Commission, have you not?

A Yes, I have.

Q As a petroleum engineer? A Yes.

Q For the benefit of the record in this case, would you briefly review your background and experience?

A Actually, fifteen years ago I went to work for Magnolia Petroleum Company, spent five years with them, the last three being in the reservoir section of the Natural Gas Department of the old Magnolia, now Mobil Oil Company. During that three-year period I had the responsibility of calculating reserves under all of Mobil's gas properties in the South Texas area, that included everything south of San Antonio in Texas. Ten years ago I went to work for Southern Union Gas Company and was hired as a reservoir engineer, and for about two years did all of Southern Union's reservoir work, and since that time have been in charge of the department that handled reservoir work for Southern Union.

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Q Now, in connection with that work, are you familiar with the Basin-Dakota Gas Pool?

A Yes, I am.

Q How did you become familiar with that pool?

A We, Southern Union Gas Company was a partner, I guess, in the drilling of the first Dakota well drilled in the San Juan Basin and have constantly been in touch with it since the Dakota came into its own some three or four years ago. We had either under contract or owned some four, five hundred locations that either are productive or appear will be productive from the Dakota.

Q In connection with your duties with Southern Union Gas Company, have you made any calculations on reserves in the Basin-Dakota Pool?

A Yes. If the Commission please, I don't know how this is going to affect you, but we have had two series of reserve studies made in the past year. One, made by DeGaulier McNaughton covering some twenty-five producing wells and some forty undrilled locations; another one just completed by the firm of Ralph E. Davis in Houston, covering the same area, including the total five hundred locations or so that I mentioned previously.

Now, I worked in direct conjunction with these two firms going over their data, supplying them with the information that

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they required and then checking out their answers with respect to the reserves underlying the Dakota formation in the San Juan Basin.

Q Now, in anticipation of questions which will probably be asked on cross examination, could you briefly state what information was used in making these calculations?

A We had available a very limited amount of core information which we tried to correlate against the induction electric logs, and the microlog sonic logs.

Q Were you able to make that correlation?

A It is rather hard to do, frankly, because of the scattered information that you have with respect to core analyses. You can get a relationship, though, that can be used if you'll interpolate it with a little common sense. In addition to that we have run a number of pressure decline studies on some of the wells which have been on production long enough to give you what I consider to be decent information. The results of these studies indicate that the reserves in the San Juan Basin, underlying any given 320-acre tract, at a maximum will range in the five to six million foot category, and in the very extreme edge of what is now known as the Basin-Dakota Pool which is producing the reserves, appear to be in the range of one and a half to two billion feet.

Now, we ran these studies both in the good parts of the field

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and in the poor parts of the field.

Q That will give a range of reserves roughly of three to one, the maximum, is that about right?

A Three, three and a half to one is the ratio between the poor area and what we call the heart area.

Q Have you made a comparison of the range of reserves as you have calculated them to the range of allowables under the present formula?

A Yes, we have. In Township 28 North, 11 West, which is one of the better areas, we have a range of deliverability in the range of about 766%. In that same township our reserve information would indicate that the reserve variation was in the range of 225%, which means that under our present formula we are giving to the high deliverability wells about three times as much gas as they should receive if we were basing it strictly on the reserves underlying any given 320-acre tract. I'm not saying the reserves that will be recovered because in a previous case before this Commission we showed that in certain areas it was possible to drain gas over an area much larger than a 320-acre tract.

That is the problem we face today in that if we maintain our present formula we are not protecting correlative rights as between wells within the Basin-Dakota Pool. I did some work which indicates that as of February, 21.7% of the wells in the San Juan

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Basin received 52.1% of the allowable.

MR. PORTER: How many wells?

A 21.7% of the wells on the proration schedule received 52.1% of the, this is an uncorrected allowable. That's before you take care of previous overages and underages and so forth. This is somewhat approximately twice as much as our calculations indicate should be given to these 21.7% of the wells. I had 118 wells, used 118 wells as the 21.7% based on my addition of the number of wells under the proration schedule.

Q In your opinion, then, does the present formula cause a violation of correlative rights?

A Yes, I think that is one of the problems we must face is that the present formula does violate the correlative rights situation as it now exists in the San Juan Basin. Any time you allow a well to produce in a ratio of three or four times its reserves to its offset tract, then if it is not occurring today within this period of twelve or twenty or thirty years we are talking about, it has to take place.

Q Mr. Wiedekehr, your company, in addition to being an operator of the wells in this pool, is it also a purchaser?

A Yes, sir.

Q Does the situation which exists on account of the present proration formula pose any special problems to your company?

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A From the standpoint of a pipeline company operating in the State of New Mexico, we would be better off today when there is an excess of capacity, if we could shut in every good well and take all our gas from the poor wells. What we are doing, in effect, under this present formula, is gutting the heart of the field, gutting the good wells, and some time in the future, and we, none of us know when that will be, we will need all the gas we can get out of the Basin. At that time the good wells are going to be gone and we are going to have to be relying entirely on the good wells that are now poor because we have gutted them, and the poor wells that we now have.

So, strictly from a pipeline standpoing we'd be better off to take a majority of the reserves, the majority of the take today from the poor well and leave the good deliverability until such time as we needed it.

I made the statement to our President, in discussing this case, that one of these days we were going to have the Kutz Canyon Hill covered with more compressors than we can count. That is an economic waste. I recognize that is not one of the things that is of prime importance here, but that, in conjunction with the fact that we are violating correlative rights, makes me think that we need a change in the formula as it now exists.

Q Do you have anything further, Mr. Wiedekehr?



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A No, I don't think so.

MR. KELLAHIN: That's all the questions I have of the witness, Mr. Porter.

MR. PORTER: We'll take a ten-minute recess.

(Whereupon, a recess was taken.)

MR. PORTER: The meeting will come to order, please.

Does anyone have a question of Mr. Wiedekehr?

MR. STOCKMAR: Stockmar for Consolidated Oil & Gas.

MR. PORTER: Mr. Stockmar.

CROSS EXAMINATION

BY MR. STOCKMAR:

Q Mr. Wiedekehr, you stated on direct examination that if the high deliverability wells are gutted, I think was your term, that you would have to install compressors in the field. Would this raise the cost of producing the gas and, therefore, raise the cost of gas to the citizens of New Mexico?

A About two cents a thousand to compress.

Q You may not have been here yesterday, but there was a lot of testimony with respect to the economics of a million deliverability well. In your opinion, is a well with a one million MCF deliverability a commercial well if it's allowed to produce? Will it drain its reserves in a reasonable time? Will it provide a reasonable economic payout to the operator?



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A I would recommend to our company that we drill a well that we knew would make a million cubic feet of gas a day in the pipeline if I knew we could sell that million cubic feet of gas a day, yes, I feel like a well of that category would definitely drain its reserves in an economical and economic time limit.

Q Is the same thing true for a 500,000 MCF deliverability well?

A Yes, your economics gets a little poorer there, but that would still give you fifteen million a month and you can justify drilling one of those.

MR. STOCKMAR: That's all the questions I have.

MR. PORTER: Mr. Howell.

MR. HOWELL: Ben Howell, El Paso Natural Gas Company.

BY MR. HOWELL:

Q Mr. Wiedekehr, where would you put the breaking point on an economic well?

A Somewhere in the range of three, let me back up here, somewhere in the range of eight to ten million per month; any well that will not make that much gas will not give what I consider to be a fair payout time.

Q So, then, a well that is in the range of a deliverability of four to five hundred thousand per day is right about the breaking point on an economic well?



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A That's correct.

Q Mr. Wiedekehr --

A Let me qualify that as that is correct for a company such as ours who are in the 52% tax bracket. Now, that does make a difference.

Q Mr. Wiedekehr, at the present time there is substantially more gas available in the San Juan Basin than there is a market for such gas?

A Yes, sir.

Q And Southern Union wears two hats in the Basin just like El Paso does, it's both a producer and a purchaser?

A Correct.

Q Now, from the standpoint of the purchaser, I understood your testimony earlier, you would prefer as the ultimate from the purchaser's standpoint to have the high deliverability wells shut in and kept for the time of high need?

A Mr. Howell, let me give you an example there of the way we feel about it. Down in the Tapicito Field we have one well and it's been offset by a number of operators in a lot of directions trying to find it with a capacity of roughly ten million a day in the pipeline. All summer long that well is shut in, we own it jointly with Humble, and nobody can drain the gas out of it, so we shut it in all summer long. We use it for peaking

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purposes in our winter months. Now that's ideal. I recognize that we can't have that ideal situation in the Basin.

Q That's right, from the pipeline purchaser's standpoint the ideal situation is to keep your best wells shut in to use for the period of high demand?

A Correct.

Q Now, then, you say that you are going to have compressors all over the area. As a matter of fact, the purchaser's under contractual, under existing contracts, as the well-head pressures go down, is required itself to produce additional compression, isn't it?

A I understand that your contracts, so called.. Ours are somewhat different.

Q You put the burden upon the producer?

A In certain instances, yes.

Q Now, the effect of shutting in the higher producing wells tends toward creating a storage project, doesn't it?

A As much as I hate to answer your question, yes.

Q If there's anybody that advocates a storage project in that Basin it isn't El Paso, isn't that correct?

A Actually I think we are getting a little off the subject.

Q I'm sure we're off the subject, Mr. Wiedekehr, but there were some rather wild and rather unnecessary accusations made

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yesterday and I would just like to nail them down.

MR. KELLAHIN: If the Commission please, the accusations were made and the objection made and they were ordered to be stricken from the record.

MR. HOWELL: I beg to differ, the same statement was made by the witness at another time. The emphasis or the impact is in the minds of the people that heard it, and I think we are entitled since that did exist to clear the matter up a little bit.

A If the Commission please, I will answer that question in this manner: El Paso, by asking for a high deliverability, is not, in effect, asking for the creation of a storage reservoir. They might, by buying gas in other areas and leaving a lot of San Juan gas shut in, be creating a storage reservoir.

Q To carry that a little further, Mr. Wiedekehr, you don't have any Federal Power Commission limitations on the amount you can produce and sell, do you?

A Only as a producer, not as a pipeline company.

Q And, as a matter of fact, El Paso is taking an average of approximately fifty million feet per day of your gas in the San Juan Basin in order to try to equal your takes with El Paso?

A That is correct.

MR. HOWELL: Thank you.

MR. PORTER: Does anyone else have a question? Mr.

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Everett.

BY MR. EVERETT:

Q As a purchaser you are familiar with the ratable take provisions of the New Mexico laws and regulations?

A Yes, sir.

Q And you endeavor to comply with those regulations, I'm sure?

A We do.

Q I think you testified that you participated in the drilling of the first Dakota well in the Basin?

A I believe the first Dakota well that was completed in the Basin, we were a party to that under a unit agreement.

Q When was that drilled?

A Oh, this must have been back in, oh, early, in the early 50's, I would guess, and the exact time on that, I can't tell you the exact date.

Q When did you first have a market for the gas from that well, if you remember?

A Immediately thereafter. It was drilled in the old Kutz Canyon-Fulcher Kutz, I guess at that time it was called the Kutz Canyon-Pictured Cliffs Field, and a market was available right along with the rest of the producers at that time.

Q And since that time how many wells have been drilled

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in the Basin-Dakota, if you know?

A I would guess that as of today there are probably 600, 550 to 600 wells in the Basin-Dakota Pool.

Q You are talking about the productive wells?

A Yes.

Q Do you know whether or not there have been any dry holes drilled?

A Yes, sir.

Q Do you have any idea how many?

A I would guess that there probably are fifteen or twenty. I don't know the exact number. The only ones that I'm familiar with are the ones that we drilled or participated with, but I would guess there are fifteen or twenty dry holes in the Basin that were drilled in the Basin specifically for Basin-Dakota production.

Q Let's look at the market a little bit and the ratable take law. If you had a given market which is limited in this case, as we know, and you had 200 wells to supply that market, and then three years later you had the same limited market but had in the neighborhood of 550 to 600 wells to supply that market, wouldn't the effect be, under the ratable take provisions, and regardless of any allocation formula, wouldn't it be to cut down the amount of gas that the 200 wells would supply to the market by the addition

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of the other 350?

A Certainly, when you drill wells you don't need, you slice your pie a little thinner.

Q That would exist regardless of the allocation formula, is that correct?

A That is correct.

MR. EVERETT: Thank you.

MR. PORTER: Does anyone else have a question?

BY MR. UTZ:

Q You have done quite a bit of reserve work?

A Yes, in Tocito.

Q Would you care to state how much reserves under a 320-acre tract that you would have to have to pay out a Dakota well?

A We placed our cutoff at the very minimum economic limit at four million cubic feet per acre, which on 320-acre spacing would be 1.28 I guess, billion.

Q About one and a quarter billion?

A Right.

Q I believe you testified to the effect that the maximum reserves that you calculated for some four or five hundred tracts was six billion?

A That's right.

Q Then the ratio of reserves between the lowest economic



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tract and the highest reserves would be in the order of 1 to 4.8?

A I don't have my slide rule, but if you divide six by one two five, that would be the answer, somewhere in the range of four to five.

Q Yes, sir. Now, any well below a billion and a quarter reserves would be sort of a salvage operation?

A It would be that, yes.

Q So, in arriving at a proration formula where you have deliverability involved, would you say that a proper formula would be one which gave you the same allowable ratio as you had to reserve ratio in the pool?

A If we are going to have a deliverability factor in the proration formula, then a formula with that ratio would be probably the most fair formula that you could come up with, yes.

Q In other words, you couldn't come much closer to allowing each operator to recover his fair shares of the reserves under his tract?

A No. And if the operator had production scattered throughout the Basin where we would run into problems in one area, it would tend to offset itself in the other one. I think a formula on that type of basis would be fair.

Q Do you have an opinion as to how much deliverability you should allow in the formula to arrive at that sort of a ratio?



A We have done some work, and frankly any time you get into the use of a deliverability factor in a formula you have to make some other assumptions, but we feel as far as being completely fair, that probably the allocation to deliverability should be in the range of one-third. I do not particularly disagree with the formula that is proposed here now, 60, 40, but I feel like something in the range of 33, 66, in that range, is one that would be fair in this Basin-Dakota Pool.

Q At any rate, whatever the ratio is, it's your feeling that it should be in the same ratio to provide allowables in accordance with the reserves?

A That is correct.

MR. UTZ: That's all I have.

MR. HOWELL: Ben Howell, representing El Paso.

BY MR. HOWELL:

Q Mr. Wiedekehr, Mr. Utz asked you as to your figures, and I believe you said approximately one and a quarter billion in recoverable reserves was the point which you thought was the breaking point for a commercial well?

A That is a very minimum that you can expect to ever get your money back.

Q You figure that in cases in which your percentage of gas as working interest is around 85 to 87½%, isn't it?

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A Actually ours is about 82½, Mr. Howell.

Q If you lower it to 75 or 70, then obviously your break even point gets higher and you have got to have more reserves to get a payout?

A That's correct.

Q Now, as to the formula, I think we are all in agreement on the fact that in a formation such as the Dakota, which is a tight formation and requires stimulation to give up the gas to the well bore, that consideration must be given to deliverability. You agree with that premise, do you not?

A No, I don't. I don't agree that deliverability has to be in the formula at all. I do agree that straight acreage alone is not enough. We need something to take care of the other factors that influence reserves, and you could reach up in the air and pull out another factor that had acreage and pressure and come up with something that could be just as fair as a formula with deliverability in it.

Now, back again, we as a pipeline company, like some deliverability in one, but there's no reason that deliverability has to be in a proration formula for it to be fair.

Q In this formation, in this particular formation some consideration must be given to the availability of the gas, is that not correct, whether you determine that by pressure --



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A Right.

Q -- or whether you determine that by measured deliverability?

A Correct.

Q We're all in agreement as to that factor?

A We need something besides acreage, yes.

Q Now, then, the problem that is before us is one of determining the effect that should be given to the deliverability in order to give a fair proportion of the recoverable gas reserves to each owner, is that correct?

A I think that's right, yes.

Q And in such a situation I believe you'll also agree that what we must consider is averages for the pool as a whole, recognizing that there are individual freaks that occur in any gas patch?

A Yes, I think that since it would not be feasible to calculate the reserves under each given 320-acre tract in this fifty square mile area that we are talking about, or whatever it is, that we are going to have to use something that is an average figure.

Q And you would in general say that the formula should fit the majority, the great majority of the wells in the pools even if it may not fit certain freaks?



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A I think that if you have freaks you ought to have some provision for taking care of them. I would say that you need a formula that fits the majority of the wells and then you can take care of the freaks.

Q You would have to look at the freaks on an individual basis when that came up to determine that they were freaks?

A That's right.

MR. HOWELL: Thank you.

MR. PORTER: Mr. Everett.

BY MR. EVERETT:

Q In your calculations, did you or have you made a determination of your cost of operation in terms of cents per MCF of gas?

A Not exactly on terms of MCF, cents per MCF. We know what our average cost to operate a Dakota well is, and we use an operational cost figure based on our experience.

Q Could you translate and give it to us in terms of cents per MCF?

A No, sir, that would be impossible because of your fluctuation in takes from the various wells. If all wells were allowed to produce the same MCF, yes, but it costs just as much to operate a poor well as it does a good well. So there's no relationship there from an operational standpoint.



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Q Well, yesterday one of the witnesses testified that in their calculations they used an average number throughout the pool, cost of operations of two cents per MCF. Do you think that is a proper figure?

A There's no way that you can apply a cents per MCF to the field as a whole, because it's going to vary from well to well. If you give me an average well and give me two cents per MCF I can tell you whether I think that's fair or not.

Q Well, we had another figure of \$150.00 a month per well. How does that compare with your costs? Let's take one of your wells, any one you want to take.

A Our average cost to operate the Dakota well in the San Juan Basin is slightly under a hundred dollars a month.

MR. EVERETT: Thank you.

MR. PORTER: Anyone else have a question of the witness? You may be excused.

(Witness excused.)

MR. KELLAHIN: If the Commission please, that concludes the presentation by Southern Union.

MR. PORTER: I believe that concludes the presentation of those favoring the application. We have an indication by El Paso, Pubco, Aztec, Sunset and Calkins that they will present testimony opposing the application, and in the order of their



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appearances Pubco will be first.

MR. HOWELL: If it please the Commission, Ben Howell of El Paso. I've been asked by the group to raise this point. We, of course, think that we and the Commission are on the same side since we are in support of the Commission's formula. We notice, however, that there is a Commission witness who was sworn and some of us have witnesses who, when their testimony is finished, we may release to go home. It's a little embarrassing to ask this, but I think we would like to know if the Commission proposes to advocate any changes in the formula. If it does, then we would feel that we'd have to keep our witnesses here, and I suggest that in the interest of time, rather than putting them on twice in the event that whatever the Commission might advocate, would be something that we would close that we could do it all in one time if the Commission intends to advocate any change.

If it does, I suggest that it might appropriately come in now since that would probably cut down the time of the hearing since we could cover everything in one presentation.

MR. PORTER: Mr. Howell, the Commission doesn't have any proposal. One of the staff members will present some testimony concerning minimum allowables. Our attorney is out right at the moment. I wouldn't like to make that decision until



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I have seen him, see whether he wants to go on now with his witness. I think that can be determined immediately. Off the record.

(Whereupon, a discussion was held off the record.)

MR. PORTER: Back on the record, please. The Commission will recognize Mr. Morris.

MR. MORRIS: If the Commission please, we have no objection to presenting our evidence concerning the establishment of minimum allowables at this time. It would appear to be out of order, but if those in opposition to the application have no objection to it we will be glad to proceed with that testimony at this time, Mr. Howell.

MR. KELEHER: Pubco has no objection and prefers that the Commission staff members testify at this time.

MR. HOWELL: El Paso certainly feels the same way.

MR. PORTER: Mr. Utz, you have already been sworn, I believe?

MR. UTZ: Yes, sir.

MR. PORTER: You may come forward and take the stand, please.

MR. MORRIS: May I have a moment?

MR. PORTER: Yes.

MR. MORRIS: Before we proceed with the testimony of



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Mr. Utz, the attorney for Pan American, Mr. Buell, would like to make a motion in connection with Case 2049 and 1641. Mr. Buell.

MR. BUELL: May it please the Commission, with respect to both of those cases and considering the lateness of the hour and the day of the week and the fact that we are at the present time at about the half-way mark in the Basin-Dakota case, I would like to respectfully move that both of these cases be continued until the regular May hearing.

MR. PORTER: Mr. Kellahin.

MR. KELLAHIN: Jason Kellahin, Kellahin & Fox for Val Reese and Associates. We join in Mr. Buell's motion.

MR. BRATTON: Howard Bratton for Redfern & Herd. We join in the motion.

MR. MORRIS: Before the concurrences proceed, may I ask if the Commission wants to consider these cases at the May regular or defer them to the June regular when it will be heard here in Santa Fe, inasmuch as the Commission hearing in May will be in Hobbs?

MR. PORTER: Mr. Morris, the Commission is concerned, it appears that we'll have a short hearing in Hobbs next month. Probably the cases which we anticipate which we advertised will not cause us to run past noon. So it seems that May would be a good time to have them. Mr. Howell.

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MR. HOWELL: El Paso Natural Gas Company would concur in the request for continuance.

MR. PORTER: Are there any objections to the counsel's motion? Mr. Cooley?

MR. COOLEY: William J. Cooley for Great American Associates. We would strongly urge that it be continued to the June hearing due to the geography involved. That's about eight hundred miles round trip.

MR. PORTER: Mr. Buell, would you care to express yourself as to the date?

MR. BUELL: May it please the Commission, on behalf of Pan American, we would have no objection to a continuance to either date. It is the consensus of the operators that the present rules will be recommended to be continued for another year, so I do not see that a two-month delay will hurt anyone at all.

MR. PORTER: Mr. Morris, do you anticipate any cases for the June docket that might be time consuming other than these two?

MR. MORRIS: No, sir, I do not.

MR. PORTER: The June hearing will be heard on Thursday, which is one day later in the week. How would the June date suit you, Mr. Kellahin?

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MR. KELLAHIN: I think that will be satisfactory.

MR. PORTER: Mr. Howell?

MR. HOWELL: Completely satisfactory.

MR. PORTER: In that case, Cases 2049 and 1641 will be continued until the June regular hearing date. The orders are such that the rules will remain in effect until further orders are issued.

Back to Case 2504.

ELVIS A. UTZ

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Utz, will you please state your name and position?

A Elvis A. Utz, gas engineer for the Oil Conservation Commission.

Q Mr. Utz, have you made a study of the production and the deliverabilities of wells in the Basin-Dakota Gas Pool with the view toward the establishment of a minimum allowable in that pool?

A Yes, sir, I have. However, before we get into the testimony proper I would like to make a correction on one of my exhibits for the benefit of all of those who have them so that they

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won't get a distorted picture of what they're trying to show.

Exhibit 2, if you'll refer to it please, it's the bar graph. Under the three million minimum if you will just scratch out the zero and the three thousand under the bar and reverse those figures, then it will depict what I intend to show. In other words, the zero curve is actually the three thousand and the three thousand curve is actually the zero curve. Under the eight thousand minimum the same thing is true. If you'll just reverse those headings, then the zero curve as now labeled will be the eight million bar graph.

Q Do you have any further corrections to the exhibits before we proceed, Mr. Utz?

A No, sir, I believe that's the only one that I know of now that I goofed on.

Q Mr. Utz, at the outset of this consideration I would like for you to briefly explain why you feel the Commission should consider the establishment of any minimum allowable in conjunction with a proration formula in this pool.

A Well, I intend to show in this case a need for a minimum allowable, and I also intend to show the effect of various minimum allowables, namely no minimum at all, three million minimum and an eight million minimum. The need for a minimum, as I see it, from the standpoint of trying to administer gas proration, is one to



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prevent premature abandonment of small wells which receive allowables based on the present formula lower than an economic limit, and thereby prevent waste which would be due to the abandonment of these wells at an earlier date than a minimum would provide.

Second, is to establish a producing level in the Basin-Dakota below which wells in the pool would not be subject to the requirements of R-1670-C, so long as these wells do not produce above that level. These requirements of 1670-C consist of deliverability testing, the wells being subject to overproduction shut in. That's all I can think of at the present time. Wells in this category would be classified as exempt marginal wells.

Q Are you getting into your different categories of wells now?

A No, I'm just stating the second reason why we need a minimum allowable.

Q All right.

A Wells in this category will be classified as exempt marginal wells. The purchaser usually leaves this classification of wells on the line continuously, which enables them to produce a little more gas. This will also relieve the Commission of considerable administrative duties relating to small wells which are of questionable economic value. Without a minimum, these



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wells have to be classified and reclassified from time to time, this is done every six months. Whereas, with a minimum they would stay in the exempt classification so long as they produce less than whatever the minimum is set.

Q So the major reason for considering a minimum allowable is in keeping with the statutory obligation of the Commission to prescribe minimum allowables to the end that production will repay reasonable lifting costs and thus prevent premature abandonment and waste?

A That is correct.

Q Now, Mr. Utz, at the time that the formula in the Basin-Dakota Pool was originally put into effect, there was some discussion of the fact that the 25% acreage factor was intended to and would operate as a certain minimum allowable. Would you explain why you believe there is a need for a minimum allowable in addition to this acreage factor that's already built into the formula?

A Of course, when I do this I'll probably be getting somewhat outside the scope of this particular hearing as relating to the Basin-Dakota Pool. Actually, our acreage factors for the Basin-Dakota Pool during the first year of proration is about 2800 MCF per month. Now, of course, this in effect sets a minimum of just that. Low deliverability wells based on 75%



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deliverability get an insignificant amount of allowable due to their acreage times deliverability.

The reason I feel at this time that we should have a minimum allowable in the Basin-Dakota is that I know, based on my thirteen years' experience in dealing with gas proration, that the day will come when we need a minimum allowable for the reasons, the two reasons that I have stated previously. In other words, the acreage allowable will not provide enough gas to keep a well on the line and prevent premature abandonment. We've seen that in Pictured Cliff pools which have acreage allowables as low as 300 MCF a month.

Q So the 25% acreage factor just doesn't provide a sufficient minimum to prevent premature abandonment?

A That is correct.

Q Mr. Utz, let's turn to the study that you have made for presentation at this time.

A Let me clarify that. I want it to be clear that at this point the acreage factor does, in my estimation, does provide enough minimum allowable. But I'm not asking for this minimum for the immediate. We'll need it on down the road. As long as we are getting into minimums in other pools, I would like to present this testimony here and try to get one in the order for the Basin-Dakota as well as the other pools.

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Q Now, turning to your study, would you first state what periods of time were involved and how many wells you considered in the study that you have made?

A At the time I started this study I had production information available to me as of 11-30-61, so I took, I wanted to stay within a balancing period, so I took the production from February 1, 1961 through November, '61, which was, of course, ten months' production.

Q How many wells did you consider during that period?

A I considered 435 wells.

Q Even though there are at the present time, of course, more wells on the line, you had to confine your study to the number of wells that were on the line during the period involved?

A At the end of the period involved, yes, sir.

Q Yes.

A In order to project that over two complete proration periods, or through January, I divided that figure, total figure of production by 303 days and multiplied it by 31.416 days, which is the average number of days in a twelve-month period. That was my monthly demand that I used for this study.

Q What data did you use as the basis of your study? Did you use the actual production figures or the calculated deliverabilities of the wells, or what figures have you used as the basis



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of your exhibits?

A I used the market demand as just explained, which is 3,366,372 MCF a month, the 435 wells which were on the line at the end of this period, and the acreage factors and the deliverabilities of those 435 wells.

Q You also used the actual producing abilities of the wells?

A Yes, sir. In classifying wells as we do now, we classify wells, marginal or non-marginal, depending on their average producing ability for a six-months' period. Recognizing that this was true, I wanted to make this study as realistic as I possibly could, so I classified wells, these 435 wells, I classified them on the basis of their average production for the period involved, and all wells below a breaking point are actually on 100% deliverability, based on their average producing ability for the period. All wells above that point are calculated on the basis, their allowables are calculated on the basis of the formula 25, 75.

(Whereupon, Commission's Exhibit No. 1 was marked for identification.)

Q Mr. Utz, would you refer now to your Exhibit No. 1 and explain, first, if you would, the four categories of wells that you have used throughout your study of minimum allowables?



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A Well, perhaps first it might be well, Mr. Morris, to explain the significance of what I have called the breaking point. The breaking point is calculated on the basis of market demand and the acreage and AD factors available for the number of wells involved. You have a certain market demand that you have to divvy up among all the wells in the pool. Obviously if you don't calculate a breaking point, then there are some wells which receive an allowable in excess of the amount of gas that they're capable of producing. In order to assign wells an allowable which is consistent with their producing ability, it's necessary to use cut and try method and calculate that breaking point.

In this case, using no minimum allowable whatsoever but the straight formula, the breaking point, based on producing ability, is 77 MCF per day. That's about 2342 a month. In other words, all wells below 77 MCF per day are on 100% deliverability, so-to-speak, or 100% producing ability if you want to put it that way. All wells above 77 MCF have their allowables computed in accordance with the 25, 75 formula. If this holds true for the breaking point of the three million calculation and the eight million calculation, except for the fact that these lower wells receive a certain minimum determined as three million in one case and eight million in another case, so all wells below this point are put on a hundred percent deliverability or ability to produce. In



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other words, the breaking point is the same as it is in the zero minimum except it includes more wells, because we have raised the allowable on a few wells.

Q So the wells below that breaking point constitute one category of the four groups that you have considered in your study?

A No well shown in this study has received an allowable in excess of its ability to produce. Referring to Exhibit No. 1, which is the tabulation, the second sheet on most of the ones that you people have, I have divided the wells vertically into four groups, horizontally I have put the data for zero minimum, for each of these groups 2500 minimum, which is not effective at this time, three million minimum and eight million minimum.

Now, Group No. 1 is the producing ability of less than the zero minimum breaking point. There are twenty-four wells in this group. The wells in that group, as you will note, are the same all the way across. In other words, they don't change for each study.

Group No. 2 is a group of wells which have the producing ability of more than 77 MCF per day and less than the minimum allowable in cases where minimum allowable calculation was made.

The third group of wells is a group of wells with the producing ability of more than the minimum allowable, but actually calculate an allowable of less than the minimum. Therefore, are

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assigned the minimum allowable. In other words, if we're going to have a minimum we have to assign a minimum to all wells that are capable of producing. So, by using the cut and try method and the average producing abilities, I placed certain wells in that category. Of course, No. 4 group is the last group of wells, the wells which are prorated in accordance with the formula. Based on the market demand and the number of wells previously stated, if you'll follow vertically under zero minimum, we have 24 wells or 5.5% of the wells which have a producing ability of less than 77 MCF. This group of wells received in this instance 1.1% of the allowable, or 36,305.

Since we are not calculating any minimum here, we have no wells in groups 2 or 3, but the prorated wells in this case consist of 411 wells or 94.5%, which received 98.9% of the allowable assigned to the pool.

Now, the zero minimum breaking point calculates an allowable at 77 MCF, well, actually it's at 106 MCF, an allowable of 2500 MCF per month. It so happens that between 77 MCF and something slightly above, I could say what it was but I don't believe it's necessary, slightly above 106 MCF, there are no wells in this deliverability group.

Therefore, the jump from 77 to the next deliverability group, the wells in that group calculate an allowable, or wells below



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that group calculate an allowable with 2500 MCF. Therefore, in trying to arrive at a 2500 minimum, the minimum is not effective under these conditions of market demand and development.

In the next group to the right I calculated a three million minimum. Group 1 is the same as it was for the other groups. This is the point at which a minimum allowable does affect the allowables of wells above the zero minimum breaking point. In other words, in Group 2 we have 10 wells or 2.2% of the wells which receive an allowable based on the zero factors of 26,598, based on the three million factors of 27,583 or .79% of the allowable in the first instance and .82% for the three million.

Group 3 consists of 13 wells. Now, these are the wells which have the ability to produce above the minimum. This consists of 2.9% of the wells in the pool, and these 13 wells under the zero minimum formula receive 1.02% of the allowable in the pool, and with the three million minimum receive 1.5% of the allowable in the pool.

Of course, the wells above that point which are actually calculated on the basis of the formula consist of 89.4% of the wells. The zero minimum allowable would be 97.1% of the allowable assigned to the pool, the three million minimum would be 96.6%, or about 1.5% less.

Now, you notice that I have a little bar with a couple of

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arrows on it beside the zero minimum allowable. Obviously when you assign wells an allowable, or any wells in the pool an allowable above their calculated allowable for no minimum, that allowable has got to come from somewhere, you don't just reach out of the air and get it, so when you transpose the allowable from one point to the other, it comes from the better wells in the pool. That bar and the arrows are intended to show where that allowable comes from and where it goes.

You'll note at the bottom of the zero minimum column we have an allowable of 3,269,175 assigned to those 388 wells. That's where the allowable comes from that goes to groups 2 and 3. Distribution of that is shown by the arrows. In other words, Group 3 receives 4,706, or .14% of that allowable, and Group 2 receives 985, or .03% of the allowable. Both groups together only receive .17%, that's .17 of 1 percent or less than a quarter of a percent of the allowable assigned to the 388 wells. This is under current conditions, of course.

Now, moving on to the eight million minimum column, Group 1, of course, is the same. Group 2 consists now of 150 wells or 34% of the wells. The allowable assigned to these 150 wells for the zero minimum factors consists of 17.4% of the allowable. Under the eight million it consists of 23.7% of the allowable, and Group 3 we have 153 wells or 35% of the wells, which receive under the

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zero minimum factors 28.7% of the allowable. Under the eight million, 36.4% of the allowable.

Group 4, of course, consists of only 108 wells or 24.8% of the allowable, which receives 52.8% under the zero factors and 38.8% under the eight million. The transposition of allowable in this case has to come from the No. 4 group of wells, again, because that's the only place it can come from so a portion of the 1,777,218 goes to Groups 2 and 3 as shown by the arrows; Group 3 receiving 14.5% of that allowable and Group 2 receiving 11.8% of the allowable, or the two groups receiving 26.3% of the pool allowable from 24.8% or 108 wells. That's quite a shift in allowable for the eight million.

I might say at this point that I calculated this data on the eight million minimum not because I intend to recommend an eight million minimum, but because it was proposed in informal meetings that an eight million minimum was necessary in order to provide a well with a reasonable payout. I wanted the Commission to be aware of what the results of an eight million allowable would be, that's why I calculated it.

Q Do you have anything further with respect to Exhibit No. 1?

A I don't believe I do.

Q Have you prepared an exhibit showing the comparisons

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of these various minimum allowables?

A I found, to my dismay, that trying to graphically portray the information contained on Exhibit 1, it was a little difficult to do. Exhibit No. 2 is an attempt to do this, and I must admit it's not as clear as I would like for it to be.

(Whereupon, Commission's Exhibit No. 2 was marked for identification.)

Q You have used the same four categories of wells as shown on Exhibit No. 1 in your preparation of Exhibit No. 2?

A That's correct.

Q And these various categories are shown by number on the left-hand side of each bar graph?

A That's correct.

Q Would you explain to the Commission what you have depicted on your Exhibit No. 2?

A I've used percentages of wells and allowable on the vertical scale. Of course, on a bar graph there is no horizontal scale. I've divided these bars into three groups, zero minimum, three million minimum and eight million minimum. Under each group the left-hand bar represents the percentages of the wells in each group.

The next one over in the case of the zero minimum is the allowable, of course, in percentages. In other words, let me just run through this one briefly. At the bottom of the first bar

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we have 5.5% of the wells in the pool. Following the line between the two bars we see that that percentage of wells received in this case 1.1% of the allowable. In the case of the prorated wells in the pool which consist of 94.5% of the wells, they receive 98.9% of the allowable. Under the three million, the middle bar or the second one, the first one to the right of the percentage of the wells is the three million minimum bar, and the one on the right is the zero minimum. Now, looking at the bars at the bottom, I've tried to display as best I can without making the graphs unwieldy long, to show what percentage of wells in the pool receive what percentage of allowable under the two conditions shown. In other words, the effect of the three million minimum as compared with the zero minimum. I'm sure that is exactly what everyone here is interested in knowing is how a minimum allowable is going to affect them and their wells and their pocket-books, incidentally.

As can readily be seen, without going into detailed figures, I will if you think it's necessary, the effect of a three million minimum under conditions as computed here is almost insignificant. On the right-hand column I've shown the very same information for the eight million minimum. You will note that when you go from three million to eight million that the relationship between the percentage of wells, as well as the relationship between the



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allowables between the eight and zero groups of wells, change very substantially.

Q Mr. Utz, you say that the three million minimum affects the situation very little as shown on your Exhibit No. 1. Referring back there for a minute, it only affects 23 wells, being 10 wells in Group 2 and 13 wells in Group 3, is that correct?

A That is correct, 23 wells are involved and are affected and the allowable transfer from the larger wells in the pool is only .17% of that allowable, of the Group 4 allowable.

Q Do you wish to discuss the information on Exhibit No. 2 any further?

A I don't believe it's necessary.

(Whereupon, Commission's Exhibit No. 3 was marked for identification.)

Q You have also drawn some curves as shown on your Exhibit No. 3 to show this comparison of effect for the various minimum allowables, have you not?

A Yes, sir, I have. This is another attempt to show the effect of the minimum allowables which have been computed here on the basis of allowable per month on the vertical scale and the deliverability MCF per day on the horizontal scale. Now, the previous exhibit just showed the relationship of wells to allowable. Naturally since we are involved with deliverability in the



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proration formula in this pool I thought it would be necessary that I show what the relation of allowable shift was, and the relation between the three curves which are allowable curves and deliverability. The curve which is marked zero minimum, which is the upper curve, depicts the distribution of allowable per month in relation to the deliverability of the well. This curve, as you see, runs on down here to where it intersects the hundred percent deliverability, or 100% ability to produce, whichever way you want to say it, curve. Then drops straight down to zero. In other words, this point here is the 77 MCF ability to produce previously discussed.

Below that group are 24 wells, as shown on previous exhibits. Above that group is 311 wells. I might say at this time that I only went to six million per month since that included, oh, I don't remember the percentage figure, but all but about five or six wells in the pool. Anyway, I'm not too interested in showing what happens out here, I just want to show the relationship between these two curves up to a reasonable point.

The next curve immediately below the zero minimum curve is the three million per month minimum curve. You will note that it is only slightly below the zero minimum curve. Down about, oh, in the neighborhood of 1300 MCF per day deliverability it actually crosses, this is a phenomena that just happens when you start

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shifting allowable. It actually crosses the zero minimum curve. From that point on down the allowables indicated on the basis of formula are very slightly above the zero minimum.

The breaking point in this case was 204 MCF per day. Therefore, all wells below 204 producing ability were put either on a hundred percent deliverability or a minimum. In this particular instance there were 13 wells to which the minimum applied. Those 13 wells are the wells which have the producing ability above three million a month.

Over to the left of the hundred percent deliverability curve there are 34 wells, ten of those wells are the ten wells that are shown in Group 2 on Exhibit 1. Those are the wells that are assigned a hundred percent deliverability or ability to produce, but are assigned more allowable in the instance of three million than they would be in the instance of the zero minimum. This can readily be seen, this relationship is relatively insignificant.

Now we see a decided change in the eight million curve. Actually, when you go to a minimum as high as eight million, some things begin to happen to you that you didn't quite anticipate when you started. We again calculated a breaking point here which is right at 1700 MCF per month ability to produce. From the breaking point down to the intersection of the zero minimum curve we have 30 wells. I'll come back and say a little more



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about those thirty wells. To the left of the zero minimum curve we have 123 wells. Now, again, these are 123 wells which have the ability to produce more than eight million but are assigned the minimum. From 261 MCF per day ability to produce, from there on down to zero, all wells are assigned a hundred percent deliverability. There are 174 wells in that group. In other words, this simply depicts that wells from this point of 1700 MCF per day ability are calculated on the basis of the formula and the factors, the A and AD factors that are left to allocate the gas to above this point here.

I said I was going to get back to these 30 wells. When we go to eight million per month minimum, and when we use the usual methods of determining the acreage factors and the AD factors for the wells which we have got to prorate, the remaining allowable left after the minimums and 100% deliverability is taken out of the pool allowable, we note that this eight million curve crosses the hundred percent or the zero minimum curve. Now, it's not my intention in recommending minimums to reduce the allowable substantially below the allowables that would be calculated by using the formula which we now use and which is our Order 1670.

Therefore, I don't think that I would recommend an eight million minimum for the reason that by virtue of this minimum we have 30 wells in the pool which actually are assigned less allowable than

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the zero minimum allowable we calculated.

Q Mr. Utz, while you're referring to your Exhibit No. 3, would you care to speculate upon what that curve would look like if the present application before the Commission were approved?

A You mean the 40% deliverability and the 60%?

Q Yes, sir. In other words, your recommendations for minimum allowable are not solely dependent on the Commission retaining the present allocation formula?

A No, sir, they are not. I'm recommending that the Commission adopt a minimum regardless of what formula they decide to use.

Q So, if the Commission should go to a formula that included less deliverability and more acreage as factors for the allocation of production, how would you expect your minimum allowables to affect such a changed proration formula?

A As far as the position of this curve is concerned?

Q Yes, I thought you might be able to.

A Yes, sir, I can. I say I can come close to it. I can say this, I can hit it on the head as far as the fifty-fifty formula is concerned, because I happened to calculate one. That's this curve right here. Based on the same information that was used here by using a fifty-fifty formula, the position of this pointer would be the location of the curve which, in other words,

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down in here all wells below about a 7200 MCF per month producing ability would be on 100% deliverability. Those wells, of course, would be marginal wells or exempt wells, exempt marginal wells, whatever way we want to classify them, and all wells from this point up, which, incidentally, would be about 235 MCF per day deliverability, would have their allowables calculated on the basis of the formula.

Now, we can readily see what that does. That shifts allowable from up in here and down to this area in here. It was interesting to note that where the curve intersected the 75-25 curve with no minimum, the upper wells only from above about 5100 MCF deliverability, no, correction, make that 5,000 MCF deliverability per day, would receive less allowable under the 50-50 formula than they will under the 25, 75 formula. That is a very small percentage of the wells in the pool.

Q Now, Mr. Utz, in considering the establishment of any minimum allowable to prevent premature abandonment, you have to consider the economics of the production from Dakota wells, do we not?

A Yes, sir, we do.

Q With that in mind, have you prepared your Exhibit No. 4 for presentation?

A Yes, sir, I have.



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(Whereupon, Commission's Exhibit No. 4 was marked for identification.)

Q And your Exhibit No. 4, I believe, is an example of the income from various minimum allowables for wells in the Basin-Dakota Gas Pool. Would you explain to the Commission how you have prepared this exhibit?

A Well, it's relatively simple. I have calculated the general economics, based on a minimum of two million a month, 2500 a month, 3,000 a month and 8,000 a month. According to the best information I have, the value of Dakota gas at the present time, including liquids, is thirteen cents per MCF. I've used that figure as a gross income for each minimum. I've assumed that in most cases they have a royalty of 12.5%. As we found yesterday, there are cases where we have as much as 25%, so that would further reduce the economics.

I have used an actual well operating cost of \$100.00 per month. Now, I realize that this figure can vary from company to company, and it is a very hard figure to pin down exactly. In the past few years we've heard quite a bit of testimony, we have done quite a bit of investigating, and we have heard in this hearing testimony of an actual operating expense of slightly below \$100.00 a month and \$150.00 a month. In the previous case, I think specifically in recent weeks, we had \$175.00 a month testified

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to, so I feel that \$100.00 a month is a reasonable actual operating cost to use in this case.

First, let me say that I made this computation on the basis of two million and 2500 simply because I wanted to show that if the Commission decides to adopt something below what I recommend as a minimum, what the economics of that condition would be. To be sure, the two million and the 2500 minimum under the present conditions of development and market demand will have no effect.

Now, the last column I've probably erroneously marked "gross monthly income". Actually, it ought to be gross monthly income after royalty and operating costs. We see a well with two million minimum would have \$127.50 left. Now, this is the amount of money that the operator's got to put in his pocket and to consider future expenditures. It might be necessary, in order to keep the well on the line producing its reserves.

Under a 2500 minimum we'd have \$182.38 left. Under three million, \$241.25. Under eight million minimum, \$810.00.

Q Mr. Utz, let's just pick the figure of three million for a moment. Do you feel that monthly income, \$241.25 after royalty and operating costs would be enough for an operator to keep the well on the line and, therefore, prevent the premature abandonment?

A Mr. Morris, I feel that an operator that has \$90,000.00 in a Dakota well and he's lucky enough that that well will produce

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three million MCF per month, and if he's further lucky enough to only have a 12.5% override, that \$241.25 a month is a pretty insignificant figure, actually, in order for him to have any cushion so that he may make whatever necessary repairs that he might have to make to the well in order to keep the well producing gas into the line.

Now, on a five or six thousand foot Dakota well you can hardly move a rig over the hole for less than two or three thousand dollars, and that would include a swab job or various things of that nature. I'm not going to try to attempt to say here that kind of operations would be necessary for him to keep the well producing gas into the line, but I feel that \$241.00 a month is as little as an operator should expect from this Commission in the way of income in order to do what little he has to do, minor operations for which he could expect a reasonable payout. Now, by reasonable, I mean anywhere from twelve to twenty-four months. Therefore, I recommend to the Commission that they set a three million minimum in the Basin-Dakota Pool.

Q Mr. Utz, from the information that we have available at the present time for the production in the Basin-Dakota Pool in 1962, since the period in which you made your study here, how many wells would have been affected by your recommended three million minimum?



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A Well, you're giving me one there, Mr. Morris, that I didn't calculate. I didn't calculate it simply because there's quite a little time involved in making these computations, it's not as simple as it looks like on the graph. As a matter of fact, I spent two or three months at it. Therefore, I can't answer your question. I don't know how many wells would be affected. Certainly it would be, well, I'll put it this way, after I got December and January production in I discovered that the market demand which I should have used is about 20% higher than the one I did use.

Now, as far as I'm concerned, this is in my favor because these curves here show the effect if the market demand would drop 20% over what it is at the present day. If the market demand were 20% higher we would have less effect than I show on this curve.

Q Isn't it a possibility, or very good probability that because of the high demand in the first part of 1962 and the last part of '61 that no wells would have been affected by your three million minimum?

A It's quite possible since there are only 23 wells affected now. Further, I might say, for what it's worth, that I think that some of the increases in production at the present time is due to the fact that there were somewhere around 100 to



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150 Dakota wells which were tied into the Pictured Cliff lines during the middle part of 1961, and simply because they didn't want to produce the allowable then which is legitimate, if they produced the allowable they would cut off Pictured Cliff allowables, but consequently those wells accrued a goodly amount of underage. They are now connected to Dakota lines and are now, in my opinion, producing a large amount of that underage.

Q Mr. Utz, would you very briefly review the effect of a three million minimum upon the four groups of wells that you have used as the basis of your study?

A In reviewing the effect of a three million minimum as recommended, we only need to refer to Exhibit 1 again. Now, the only wells that can possibly be affected adversely under present conditions is the Group 4 wells; these wells under the present formula without a minimum would receive 97.1% of the allowable. It's 388 wells. Those wells are the ones that's going to have to contribute allowable down to the minimum wells. And the percentage of the 3,269,175 MCF that they will contribute is .17% of 1%. Divided among 388 wells they probably will have to get something different than a slide rule to figure out what the loss in income would be.

I'm not saying that this is the condition that's going to exist on down the road because as the pool depletes, this minimum



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is going to have more effect.

Q With more wells having been drilled in the pool since the time you made your study, it still wouldn't necessarily affect the percentage of allowable that would be shifted from your Group 4 wells, though, to your Group 2 and 3 wells?

A I didn't quite understand the first part of your question.

Q In other words, we have had more wells drilled in the Dakota and put on the line since the time you made your study?

A Oh, yes.

Q That would not necessarily, however, affect the percentage of allowable transferred from the Group 4 wells to the Group 2 and 3 wells?

A It would depend on the relationship of market demand and deliverability of the newly connected wells.

Q But just the fact that there have been more wells would not necessarily affect your percentage?

A If there were, there might not be any affected except the upper wells. They might all be affected. Well, they couldn't all be affected because there has been about 150 wells connected.

Q Did you prepare Exhibits 1, 2, 3 and 4 in this case?

A Yes, sir, I did.

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MR. MORRIS: If the Commission please, we offer Exhibits 1 through 4 as prepared by Mr. Utz in this case.

MR. PORTER: Without objection, the exhibits will be admitted.

Q (By Mr. Morris) Do you have anything further you would like to offer?

A I'll probably offer something further, but not now.

MR. MORRIS: That concludes the direct examination of Mr. Utz.

MR. PORTER: Mr. Utz will take the stand again for cross examination immediately following the noon recess. The hearing will recess until 1:30.

(Whereupon, a recess was taken until 1:30 P.M.)

AFTERNOON SESSION

MR. PORTER: The meeting will come to order, please. Mr. Utz, will you take the stand, please?

MR. MORRIS: With the permission of the Commission, Mr. Utz has one statement that he would like to make as a matter of direct testimony before he is cross examined. Mr. Utz, did you have something further to offer?

A Yes, sir, I have one more statement in the matter of direct testimony which I would like to make. I'm not entirely sure that the Commission understands exactly what will happen,



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at least I don't feel that I made it clear exactly what would happen without a minimum.

MR. WALKER: Is it absolutely clear to you, Mr. Utz, as to what would happen?

A I'll say this, if it isn't now, it never will be, but without a minimum the same thing will happen in the Basin-Dakota later on in the depletion life of the pool that is now happening in all the Pictured Cliff pools except Tapicito and also in the Mesaverde, whereby the formula actually calculates and assigns two well allowables in the category of 300,000 a month. Many of them are under a million a month.

Now, to assign a well this amount of allowable when the well is capable of producing more than this, in my opinion, is causing premature abandonment of these wells and thereby causing waste of the reserves which would otherwise be produced if the wells had a little more allowable. That's all I have.

MR. PORTER: Anyone have a question of Mr. Utz? Mr. Keleher.

CROSS EXAMINATION

BY MR. KELEHER:

Q Mr. Utz, as I understood your testimony, you stated that the presence of a 25% acreage factor actually in itself provides an adequate minimum allowable in the Basin-Dakota Pool at this time?

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A At this time under the present market demand, which is up over the period that I made these calculations from, the acreage allowables for the last four months, have been in the neighborhood of thirty-five to forty thousand.

Q Would not the effect of establishing a minimum allowable in effect increase the acreage factor in the current formula, would this effect not increase as time goes by, and additional wells are drilled in the pool?

A As I stated, Mr. Keleher, as the natural depletion of this pool goes on, on down the road somewhere, I can't say where, maybe five years, maybe ten years, that this pool will reach the same stage as some of our prorated pools are now, and we will, actually, based on the 25% acreage, assign allowables less than the minimum I recommended.

Q Now, in your concern for the prevention of so-called premature abandonment of wells, it is, of course, true, is it not, that all of the wells some day will have to be abandoned because of the depletion of their recoverable reserves?

A Oh, I think that's very apparent and true.

Q In order to artificially extend the productive life of certain wells approaching abandonment, is it your recommendation to the Commission that actual market allowable be transferred from the wells with substantial remaining reserves in order to

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extend the life of those wells, the reserves of which have already been depleted, would this not result in a transfer of reserves from the non-depleted wells to the depleted wells and be a direct violation of correlative rights?

A In the first place, Mr. Keleher, the question is quite long, in the first place I think you have made an assumption that these wells which I recommended minimums for are depleted. In my opinion they are not depleted, they just don't have allowable or enough current income to keep them on the line or pay the operators to keep them on the line so they can go ahead and produce their reserves.

Now, to be sure, when that day comes you are going to have to take allowable from the better wells in the pool to supplement these wells. I don't think that's improper.

Q Since there is apparently a serious question in your mind as to the actual effect as to the minimum allowable suggested in the future, and since you have stated that it is not necessary at this time, would it not be more logical to consider the recommendation at a future time when the facts are available in the light of future development and drilling of additional wells?

A I don't think so, sir, or I wouldn't have been up here giving this testimony today. I think we know what's going to



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happen on down the road, we are not sure of the exact figures or the exact effect, but we know that one day these wells are going to be assigned allowables calculated under the formula too low to keep them producing on the line. This much I know for sure, Mr. Keleher, that it doesn't ~~st~~ just right with me having to administer the gas allowables to assign a well less than a million cubic feet per month, and the income from that will not allow him to do a thing for the well. He might not even pay his current operating expenses and then I turn right around and kick him in the teeth once more by saying "You have got to test that well whether it can be tested or not". Most of the little wells have water problems, liquid problems that's almost impossible to test them. If I am going to assign them allowables under a deliverability formula, I have to have a test on them. I just don't feel like it's right.

MR. KELEHER: I have no further questions.

MR. PORTER: Mr. Stockmar.

MR. STOCKMAR: Stockmar for Consolidated.

BY MR. STOCKMAR:

Q Mr. Utz, referring to your Exhibit No. 3, the graph on the board --

A Yes, sir.

Q -- the small triangle, which I understood to be a

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result of a 300,000 minimum, is that correct?

A You are referring to this small triangle in the vicinity of 200, 300 deliverability?

Q Yes. Before that horizontal line curves up it does not cross the zero minimum line, does it?

A It doesn't until it reaches around 1400 deliverability, I believe. No, 1200 deliverability.

Q Then it would be possible because you were, in speaking of the eight million minimum, you were concerned about the thirty wells that might be put in a category, it would be possible to substantially increase the minimum over the, what is it, three million, yes, it is three million a month, is it not?

A That's what I recommended.

Q It would be possible to substantially increase that without crossing the line, as you say, and bringing wells into this awkward category?

A Yes, sir, it would be. Anywhere between three million and eight million, somewhere, I didn't make the calculation to see because I didn't feel that I was in the position of recommending minimums in excess of three million for the purposes of premature abandonment, and that's what I'm here for.

Q Yes. Referring, if you will, Mr. Utz, to your Exhibit 4 which is the example of income for various minimum allowables?



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A Yes, sir.

Q I believe that you testified that the royalty figure was at the minimum twelve and one half percent?

A Yes, sir.

Q The amount deducted, I believe, because of some small overriding royalty, say five percent, which the Government has used as a minimum for small wells in the past might add another ten dollars to that royalty figure?

A That would be pretty close.

Q I believe you testified that the operating cost of \$100.00 was a bare minimum?

A I feel that it's below the average.

Q Now, as I understand your table here, each additional one million increases the gross monthly income, as you have tabulated it here, by \$113.75, is that correct?

A Each million?

Q Yes, sir.

A \$130.00 I believe. Oh, you are referring to the gross income figures?

Q Yes. I subtract \$127.50 from \$241.25.

A That will be very close.

Q And it is consistent with the \$110.00?

A Yes.



Q \$113.00 a month for each additional one million minimum. It has occurred to us that a very important practical problem that each operator must face realistically is the possibility of the salvage value of his wells. Let us assume that that is in the area of \$15,000.00, does this sound reasonable to you?

A From what I know about it, and from testimony that's been given to me in various hearings, I think that's a reasonable figure.

Q Looking at the three billion minimum column, I believe you testified that this extra money of \$241.00 a month was just barely enough to provide a slush fund to maintain the well to take care of it. To provide funds for workovers, repairs, tests, that kind of thing, was that correct?

A That's true, and profit, if any.

Q Then an operator who is in business to make money with a 3,000 minimum is looking at \$241.00, which is a break-even figure at that point, may or may not include any profit. He is also looking at his equipment which is worth \$15,000.00 to him in cash that he can take and invest elsewhere. He has the very real practical problem, does he not, of deciding whether to go along breaking even with his equipment deteriorating, rusting, or take his \$15,000.00?

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A Is that the end of your question?

Q Yes, sir.

A I don't think he'd be a prudent operator if he didn't make that consideration.

Q Let us see, sir, then what in a sense the present worth or monthly income necessary to equal \$15,000.00 is. At 6% on your money, that's what, \$75.00 a month?

A On \$15,000.00 I get 90.

Q \$90.00 a month?

A Yes, sir.

Q If the operator, he would still just be breaking even at the first \$90.00 because that's simply what he could earn on his money. Would he not normally rather have the money if he plays in the oil business at all, does he not expect better than 6% return on his money? He might seek \$180.00 or \$270.00 at that point before he would prefer to leave the equipment and to continue to produce the well. Is that not a reasonable attitude for him to take?

A Yes, I think so.

Q Then, to replace the present worth of that money to him, if we add additional millions to the minimum at \$113.75 a month, we have to add two and a half million, raising it to five and a half million, do we not?

A If you are going to make that consideration, yes, sir.



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Q These are based on conservative estimates of the royalty burden, of the operating costs, and so forth. I realize that in directing your attention to this problem you are staying within the confines of the statute?

A That's correct.

Q But is there in this money any interest factor, return on his investment for drilling the well, there is not, is there?

A Very little, if any.

Q Is there any room at all for a recovery of his investment, the \$90,000.00 that he spent for the well?

A Well, sir, that depends on how long the well has been producing. If he only had a three million well to begin with, no. If the well had been producing at volumes in excess of that in order to receive a payout before he reached this point, well, yes, he wouldn't have a consideration as far as payout is concerned.

Q I assume if he's not receiving either interest on his money or recovery on his investment, then there's not also any profit to him involved?

A I think that follows.

Q As I understand our discussion here, which it has been, it would seem that a realistic minimum might be five and a half million, six million, which, referring back to Exhibit 3, will not place any unusual number on wells in the difficult category, is



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that a reasonable assumption?

A Answering your question in this manner, if you consider the things that we have discussed here, I think that's true.

However, my legal counsel advises me that there's some question as to what would constitute proper lifting costs, and that is within the scope of the statute. In other words, I didn't feel like I could get on the stand here and argue about what lifting costs was above something that might be reasonable.

Q If the construction we have placed on this here in this interrogation does meet the legal requirement, is it possible that you might be willing to revise your recommendation with respect to the minimum upward to five and a half million or six million?

A You say if it does meet the legal requirement?

Q Yes, sir.

A I think that it has some merit.

MR. STOCKMAR: That's all the questions I have. Thank you.

MR. PORTER: Does anyone else have a question of Mr. Utz? Mr. Everett.

MR. EVERETT: Everett for Ohio Oil.

BY MR. EVERETT:

Q Mr. Utz, referring to your example of income, I notice you use a number or a figure for the worth of gas or the value



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of gas of 13 cents per MCF. Does that take into consideration any of the value of liquids in the gas?

A Yes, it sure does, about a penny.

Q You disagree with the testimony yesterday to the effect that that gas had a worth of 16 cents per MCF?

A I know nothing about Consolidated contracts, I got this figure from a purchaser which tells me that the price, the base price of gas is 12 cents per thousand with a guarantee of one cent per thousand, and on the average it doesn't run over a penny a thousand.

Q But, if the evidence showed that the value of the liquids, when added to the 13 cents, and I believe the testimony of Mr. Trueblood yesterday was it was 12 cents plus a guaranteed minimum of a cent, his testimony was, as I recall it, was 12 cents plus a minimum of one cent, plus an additional two cents for separator liquids, or the liquids that are taken out of the gas, making a total of 16 cents per MCF. Do you recall his testimony?

A Yes, I believe that's true.

Q Well, is that accurate or inaccurate?

A I was trying to use an average figure here. Not all Dakota wells produce liquids. The average GOR of Dakota wells are in the neighborhood of 70 thousand to one. If the 13 cents

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 does not include those tank liquids, well, then, there would be income in excess of the 13 cents.

Q Let's take your figures, and using the testimony we had yesterday, let's add the three cents a thousand to the value of gas. You are looking at the economics, you have to, in my opinion, you must look at all of them, and certainly whatever value is in that gas is part of the economic picture. Isn't it a fact if you added three cents to the price of your gas that your figure for the 2,000 minimum on this exhibit would be increased by \$60.00?

A \$60.00 for which one, the two million?

Q The two thousand minimum, your figure for gas at 16 cents, we are reading it now instead of being 260 would be 320, is that correct?

A Well, it would increase my last figure, if that will suffice for an answer, to \$187.50.

Q Instead of \$127.50?

A Of course, that doesn't include royalty.

Q You would also have to increase your royalty. You can check my figures. I have figured it out, I can't testify, but you can. Gas at 16 cents, and going across your line 1 following that, my calculation is that the \$260.00 would be increased to 320, the 325 number would be increased to 400, the \$390.00

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would be increased to 480, the 8,000 minimum figure would be increased, the 1,040 would be increased to 1280. Your second column, your royalty column or schedule across there would be increased as follows: \$40.00 instead of \$32.50; \$50.00 instead of \$40.62; \$60.00 instead of \$48.75; \$160.00 instead of \$130.00.

The third column I have left the same, your gross monthly income column would then wind up \$180.00 instead of \$127.50; \$250.00 instead of \$182.38; \$320.00 instead of \$241.25 and \$1,020.00 instead of \$810.00.

I think the record does show that the value, certainly at least insofar as the record at this point indicates, that the values of those operators who have testified is 16 cents per MCF. If that is the fact, then, in figuring the economics of those operators, would these numbers I have given to you be approximately correct?

A Just eyeballing them, I'd say they'd be close.

Q So that your economic picture changes. You also heard the testimony yesterday that some of the gas contracts have escalation or price increase clauses, did you consider that 13 cents per MCF would be the highest price received for gas during the remaining productive life of the field, or did you take into consideration the possibility that there would be an increase in price of gas?

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A I don't propose to try to out-think the Federal Power Commission as far as price increases are concerned.

Q well, we're all in that same boat. One other item which was mentioned in some of the examination concerned an overriding royalty. Do you feel that it's proper for the Commission, or that you should recommend to the Commission in the way of a minimum formula, or a minimum allowable, a number that would take care of an operator whether he improvidently or otherwise had high overriding royalty on his production?

A Well, firstly, I think you should understand that is quite normal to have an additional 5% override, which I didn't put into my calculation here, anywhere from zero to 5%, since that does vary I didn't want to put it in here. To further answer your question in regard to royalties in the neighborhood of 24, 25%, I think that all operators, large or small, and I also think it's the American way of life, to take a gamble. The Pilgrims did. If he is taking a gamble on paying that much royalty I think he should be given some consideration for it.

Q You think that that's the proper function of government to protect him against his own gambles?

A No. That is why I didn't include any more than 12.5% in my figures.

Q Then, your answer to my question is that an overriding

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royalty regardless of amount should not be considered in determining the economic life of a well?

A I think a reasonable overriding royalty should be considered. And by reasonable, I would say 17.5%.

Q Total royalty or overriding royalty?

A Overriding royalty.

Q Making a total royalty of 25%?

A No, sir.

Q 32.5%?

A No, total royalty of 17.5%.

Q You are talking about a 5% override now?

A That's true.

Q The evidence showed that it had no override on its leases, none whatever, do you think that it should be penalized because it did not have that override, by having some of its income taken to take care of the fellow or the company which it might have helped by giving it acreage to drill?

A Mr. Everett, I don't propose at any time to try to study the economics on each and every well for which we should give a minimum to. I have strived here to use figures which were average, and I thought normal. Now, if he has more royalty than I figured here, he's just going to have a little rougher time getting his gas out of the ground under my recommended minimum.

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If he has less, well, then, he's just lucky.

Q As I understand the statute with reference to determining the premature abandonment of wells, and you said you had been advised by your attorney, what items did he advise you as being proper to include in determining whether or not any given lease or well might or might not be prematurely abandoned?

A The figures that I have used here as being normal and reasonable.

Q Beyond that he would not advise you to go, I take it?

A That's true.

Q It was based upon his advice that you used these minimums, then, instead of some other figure?

A I think that we would very well have gone along with another 5% royalty.

Q I'm asking you what your advice was, that this was the maximum to which you could go?

A No, I wouldn't say that that was the precise advice. The precise advice was that we could use whatever we could reasonably call lifting costs.

Q In your figuring lifting costs, did you endeavor to figure it on a cents per MCF basis?

A No, I consider lifting costs included in the \$100.00 that I have included here, plus some other incidentals that we

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all know, and you, too, that do incur in the operation of a well.

Q But you didn't endeavor to figure it on a per MCF basis, that was my question?

A No, sure didn't.

MR. EVERETT: That's all.

MR. STOCKMAR: May I correct the record?

MR. PORTER: Mr. Stockmar.

MR. STOCKMAR: I believe that Mr. Trueblood testified that as to all wells, the total cost of gas and condensate might average $15\frac{1}{2}$ cents. It was Mr. Everett that testified that 16 cents would simplify his calculations. That convenience should not carry over into the record here.

Secondly, let us look at the realistic results of the operation of a small well. Does a small well produce the average amount of condensate per MCF?

A No, sir, it does not.

BY MR. STOCKMAR:

Q Is it possible that a three million well will not produce any condensate or a very small amount per month?

A Usually most Dakota wells produce some liquids. We have GOR's which I've looked at in the San Juan Basin in the Dakota Pool that range from, well, zero to some of them as low as 4,000. I think that's evidence in itself that just because

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you are going to get three million cubic feet of gas, you can't be assured of any amount of liquids.

Q You might get something like five barrels a month, is that per million?

A You could.

Q And that you have to put into the tank?

A That's true.

Q Might take several years to fill the tank, is that correct?

A Well, it would depend on the size of the tank.

Q If it's any larger than a bucket, will a certain amount of evaporation take place so that the condensate cannot be sold at a profit?

A These are high volatile liquids, if they are let to weather too long you will lose a lot here.

Q Is the remaining two and a half cents of Mr. Everett's three cents a realistic figure to consider to add to your 13 cents for these small wells?

A That is the reason I didn't consider liquids, because if a fellow has liquids that he can gather in a well, I think he's just one of the fortunate operators, and because, I can't rest assured that he's going to have any liquids at all, I didn't include them in this thing because they vary too much.



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MR. STOCKMAR: Thank you.

MR. EVERETT: I think the record will show I used the 16 cents as a matter of convenience. It will also show that the 16 cents was used by the witness as a matter of actual calculated price.

MR. HOWELL: Ben Howell, representing El Paso Natural Gas Company.

BY MR. HOWELL:

Q Mr. Utz, of all of the gas pools in the San Juan Basin, the Basin-Dakota at the present time has the fewest wells that are in need of a minimum allowable, does it not?

A Excluding Devils Fork, I think that's true.

Q Devils Fork is a rather peculiar situation since there is a volumetric formula in effect there?

A That's correct.

Q So, of all the pools, would you not say at the present time there is less need of going into the problem of the minimum allowable in the Basin-Dakota than there is in any other pool?

A At the present time, yes, but the day will come.

Q Now, in your opinion are there pools in which this problem is a serious one that must be met?

A Yes, sir.

Q Well, wouldn't it be better to put a patch on the

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fellow that's got a hole in his side than one that's got his thumb stuck with a needle?

A Well, Mr. Howell, maybe we ought to take some precautions to keep from getting that hole in his side.

Q Aren't you, if you accept a certain figure in this Basin-Dakota Pool, to some extent prejudging questions as to minimums that may arise in other pools?

A I wonder if you would repeat that?

Q Aren't you, by establishing a minimum here, assuming that the Commission should accept your recommendation, aren't you then setting a precedent in this pool that may be effective in other pools that have entirely different characteristics and entirely different problems?

A You mean precedent as to a minimum allowable or a certain minimum allowable?

Q Either.

A Oh, not necessarily, I've known the Commission to do things that it didn't repeat.

Q Well, if according to your testimony--of course, you have known some of us to change our minds too, haven't you?

A I have. I didn't mean to infer that was improper.

Q But my point is this, that if you take the pool that has the least need of minimum allowable of any in the Basin and put it



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in at this time, doesn't that, to a marked degree, prejudge cases involving other operators who have had no right to appear and no right to present their arguments pro and con?

A Well, Mr. Howell, I think when we set the 25, 75 formula in the San Juan Basin, we did just that, and I don't see any more harm in prejudging a minimum allowable than I do a formula in a pool.

Q You would not, then, carry the recommendation as to the amount of the minimum allowable in this pool over into any other pool?

A No, sir, I would study it for what it was at the time I made the study.

Q And would recommend that be done in the event the question is raised in another pool?

A Yes, sir.

MR. HOWELL: Thank you.

MR. PORTER: Does anyone else have a question of Mr. Utz?

MR. MORRIS: I have a question on redirect.

MR. PORTER: Mr. Morris.

REDIRECT EXAMINATION

BY MR. MORRIS:

Q Mr. Utz, in determining how much monthly income a well should have in order to prevent premature abandonment, did you



take into account costs of workover?

A No, sir. I merely used what I would say is a minimum judgment figure as to the amount of pocket money, shall we say, that an operator should put in his pocket for profit, or a reasonable payout on minor repairs that he might have to make to his well in order to keep that well producing into the line and recover the reserves and prevent waste.

Q Would it be a fair statement that costs of workover would be recouped by the additional ability of the well to produce as a result of the workover and, therefore, you did not consider that in your calculations of reasonable lifting cost?

A I did not consider that, Mr. Morris, for the reason that a workover on a well is a matter of judgment as far as the individual operator is concerned and can be just as risky as drilling the well in the first place.

Q Mr. Utz, adding another 5% or so of overriding royalty to the 12.5% figure that you have already used in your computations, would make little difference in the figures that would be available to an operator's monthly income, would it not?

A Yes, that's true, it would, and for that very reason, as I stated, I'm using minimum figures here.

Q In fact, it would make such little difference that it would make no difference as to your recommendation in assigning

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3,000 minimum?

A I think we are talking about pennies as far as investment is concerned.

Q Mr. Howell was concerned on cross examination with our giving consideration to the establishment of minimums in the Basin-Dakota Pool at this time, and expressed concern that perhaps the Dakota needed help less than other pools in the San Juan Basin. Is the Commission and are you presently engaged in a study of minimum allowables in other pools at this time?

A In every other pool in the San Juan Basin.

MR. HOWELL: Ben Howell with El Paso.

RE-CROSS EXAMINATION

BY MR. HOWELL:

Q One other question, Mr. Utz. Mr. Morris mentioned a workover. From your experience, wouldn't you say that when an operator works over a well he expects to recover his workover costs out of the increased production from that well?

A Well, I think he wouldn't be a very prudent operator if he didn't expect to, he may not do it, you know.

Q That's right, he may not do it. On the other hand, when the operator works over that well he intends to make a profit out of the workover, and it shouldn't be charged against the current production that he's got there. He's not intending to pay it out

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of that current production, is he?

A On the minimums I recommended here he couldn't possibly do it.

Q So that any workover he would anticipate, if he were a prudent operator, that he would recover those costs from increased production?

A He should.

BY MR. EVERETT:

Q You testified, Mr. Utz, and I think this is an accurate transcription of your testimony at this time, the acreage factor does provide an adequate or sufficient minimum. Do you recall that testimony?

A Yes, sir, that's true.

Q At what time in the future do you think the present acreage factor would cease to provide an adequate or sufficient minimum?

A Well, Mr. Everett, I haven't looked at my Ouija board lately, it hasn't been too good anyway. I can't sit here and tell you how the Basin-Dakota Pool is going to develop from now on and what the deliverabilities of the wells that are going to be drilled from now on or whether there's going to be 10% of the acreage developed or 100% of it, so I can't make any prediction as to exactly what is going to happen as far as these minimum

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allowables are concerned on down the road. Heaven knows if we don't do something for the market in San Juan Basin there probably wouldn't be any more development in Basin-Dakota.

Q To get back to my question, you wouldn't even hazard a guess whether it's five years, ten years or what?

A I think we can probably to some extent, at any rate, I'll say to a large extent, judge the Dakota Pool by what has happened in the Mesaverde. They're probably about the same size in areal extent, the only difference is that we don't need the gas now and we did when they were developing Mesaverde. And I would say that the development in the Basin-Dakota is going to be substantially slower than it was in the Mesaverde. Probably, well, I don't think I would be too far wrong in saying that the pool wouldn't be fully developed in five years, and maybe longer.

Q But I'm asking you about whether the acreage factor does provide an adequate or sufficient minimum. You have already testified that it does?

A At the present time.

Q Are you saying that you cannot or will not give your best opinion as to when it will cease to provide an adequate or sufficient minimum?

A Anything I gave you, Mr. Everett, would be a stark guess. If you want me to guess, I'll guess right with you ten

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years.

Q That's what I want is your guess. You recommend to the Commission to put it in effect now, and I wondered as to when we might need a minimum from the standpoint of your testimony.

A Of course, if we get a substantial increase in market demand it might be five years too.

MR. PORTER: Does anyone else have a question of the witness? Mr. Buell.

BY MR. BUELL:

Q Mr. Utz, recalling your testimony generally with respect to your Exhibit 4, and particularly with reference to your testimony relating to the difficulty you had arriving at your hundred dollar operating cost figure, do you recall that testimony?

A Yes, I recall the testimony. I don't recall that I was unduly worried about the difficulty.

Q You know that you pointed out that you had seen one operator with an average cost of 75, another one with slightly less than a hundred, another one with one hundred and fifty, and you recalled in a hearing a few weeks ago 180, I believe it was.

A 175.

Q I wonder, Mr. Utz, due to that difference with an individual operator from less than 100 to 175, don't you feel that the Commission could more intelligently appraise and realistically

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set a minimum if it was considered on an individual well basis rather than a poolwide basis?

A Yes, sir, I think that's true, but I think it would be most impractical.

Q Well, impractical from what sense, Mr. Utz?

A Well, let's say from the administrative standpoint if nothing else. We would have to set up --

Q I realize it would be easier for you to set it on a poolwide basis, but don't you feel that the opportunity for violation of correlative rights would be more apt to occur when you handled it that way than if you looked at it on an individual well basis?

A I'm not real sure they would be.

Q For instance, Mr. Utz, let me advise you, or let me ask you to assume that Pan American's average operating cost on a Dakota well is \$50.00 a month.

A I understand that.

Q If your recommendation of a gross monthly income of \$240.00 or \$241.00 will prevent premature abandonment, Pan American could operate a well without abandoning it prematurely with a minimum of only 2500, 500 less than your recommended minimum, because our operating costs are only \$50.00 rather than a hundred a month.

A In arriving at operating costs, as you well know,



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Mr. Buell --

Q So we would get almost the same monthly income with 2500 as an operator with \$100.00 a month would get with 3,000?

A I was still cogitating the last question. Will you repeat that?

MR. PORTER: I don't believe it was a question. I believe it was a statement.

Q What I was saying, Mr. Utz, and what I will ask you, with our \$50.00 a month well costs --

A Yes.

Q -- we would achieve the same gross monthly income with a minimum allowable of 2500 as would an operator with a hundred dollars a month average operating costs get with the 3,000 a month minimum?

A That's true, if your \$50.00 includes the same items that the operator with the hundred dollar cost included.

Q Yes, sir, I feel sure it does, and assuming it does and Pan American was granted a blanket minimum of 3,000 as you recommend, it would be violating the correlative rights of the other operators in the pool, would it not?

A I'm not real sure that would be true, no, sir. At least I can say this to answer your question --

MR. PORTER: Just a minute until he finishes his answer.

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A I can say this, that you would be making a little more money than the other fellow but I wouldn't say that you'd be getting more than your share of the gas. That's correlative rights.

Q But I would be realizing more gross monthly income than would be necessary to prevent premature abandonment?

A Well, if you want to take about \$50.00 a month, yes.

Q Mr. Utz, I believe the record is crystal clear that it is your opinion that there is no need for this minimum at this time. I wonder if the record is as clear that the relationships that you've established with your categories and the effect of adopting the minimum at this time would be greatly changed by the time a minimum became necessary?

A The effect of a minimum is difficult to anticipate, Mr. Buell. It depends on the development in the pool, the relationship between acreage factors and deliverability as far as the basis, and the reason for having a minimum outside of increased costs on down the road, there are other factors in operating a well, the price of gas, possibly they wouldn't change.

Q I don't believe I made my point.

A The principle would still be there.

Q Excuse me?

A The principle would still be there to prevent premature

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abandonment and waste.

Q I don't believe you understood the point I was driving at. The Commission here today, looking at your work that you have introduced, they would say to themselves this, "We adopt the 3,000 minimum, it would affect the good wells very little". I believe you said one percent that you would take from the good wells to give to the poor wells?

A Less than a quarter of a percent.

Q Isn't that true because at this time there is no need for a minimum?

A A minimum at this time would not be effective. I think there's just as much need to put a minimum in the rules now to be used on down the road, as it is for some other pools.

Q But, at the time that minimum is actually needed, Mr. Utz, is it not a matter of fact that the disturbance of correlative rights will be much greater in that you will have to take a lot of gas away from the good wells to give to the poor wells?

A The shift in allowable will be greater, yes, sir. I wouldn't --

Q Don't you think there would be merit in the Commission waiting until a minimum is necessary so that you could make another study similar to the one that you have made so that the Commission could then tell what the actual effect of adopting a

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 minimum was going to be on the pool?

A No, sir, I don't.

MR. BUELL: That's all.

MR. PORTER: Mr. Kellahin.

BY MR. KELLAHIN:

Q Mr. Utz, I want to clarify one point brought out by Mr. Buell, if I can. I believe you testified that in the event a minimum of 3,000 cubic feet were assigned to Pan American, they might get more than their share of the money but not more than their share of the gas, is that correct? Did I understand it correctly?

A You mean my answer to Mr. Buell?

Q Yes.

A Yes, sir.

Q In effect, then, are you saying, Mr. Utz, that the wells in the Basin-Dakota Pool have sufficient reserves that with the assignment of 3,000 cubic feet there would be no possibility of violation of correlative rights? That would be the result of your answer?

A No, I don't believe it would.

Q On what do you base your conclusion, then, that there would not be a violation of correlative rights with the assignment of this allowable, the minimum allowable?

A That there would not be a violation of the correlative



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rights with the assignment of the allowable?

Q Yes.

A The assignment of a minimum, to be sure, takes some allowable from the higher wells, the bigger wells. Now, if you make the assumption that you are protecting correlative rights with the formula that you have now by allowing each well to produce the reserves under his tract, which is my understanding of what we are supposed to do, then in that instance if I assign a well more allowable than the formula permits, I would be disturbing correlative rights, but not to any great extent.

Q Then, on the basis of your recommendation you feel there would be no violation?

A Again, I'd have to make the same assumption to answer your question.

MR. KELLAHIN: Thank you.

MR. STOCKMAR: One more question.

BY MR. STOCKMAR:

Q Mr. Utz, your work is based on 435 wells?

A Yes, sir.

Q On that basis, then, the existing 25% acreage you say is the near equivalent of a minimum allowable. In connection with this ten-year guess that you made a moment ago, does it not follow that the moment you have 870 wells, twice what you have

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119-p4 now with the same market, that the time has come to double the acreage factor?

A Why it certainly does. If you don't increase your market demand you double the number of wells, you are very nearly if not exactly, I'm not real sure how it would calculate, but you would be approximately halving your acreage factor.

MR. MORRIS: One more question, please.

MR. PORTER: Mr. Morris.

REDIRECT EXAMINATION

BY MR. MORRIS:

Q Of the 435 wells in your study I believe you have testified previously that 23 of them were actually affected by a 3,000 minimum, is that correct?

A Well, 23 wells have an increase over the zero calculated allowable.

Q Yes. So those 23 wells were affected beneficially if the 3,000 minimum had been in effect?

A That's true, and there would be a lot of other wells that would be very minutely affected adversely.

Q So it would not be a fair statement to say that the 3,000 minimum would have no effect whatsoever?

A No, sir. No, sir, it would have an effect, using the additional wells that have been connected since the time that I

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drew a deadline and started my study and the increase in market demands, I don't know for sure whether there'd be any of those 23 wells affected beneficially or not, but in my opinion there would still be approximately that many.

Q Mr. Buell suggested that we ought to look at minimum allowables on a well by well basis. We all know what happens when the Federal Power Commission decided to look at each company on a company by company basis instead of on, say, an area pricing basis?

A Yes, sir, they had a landslide of papers.

MR. MORRIS: No further questions.

A I think that's just what would happen to us if we started having hearings on every well. We would either have to set up an administrative procedure, which in itself would be subject to much scrutiny, an operator can do a lot of things with his figures that he would submit for operating costs. He could include things that other operators wouldn't include. You'd have a heck of a time deciding whether it was a proper picture.

MR. PORTER: Any further questions? The witness may be excused.

(Witness excused.)

MR. PORTER: Mr. Keleher, are you ready to go forward



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with your testimony?

MR. KELEHER: We are, Mr. Chairman. The witness has been sworn.

BILL A. STREET

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. KELEHER:

Q I will ask you to state your name to the Commission.

A My name is Bill A. Street.

Q Have you been qualified as an expert witness before this Commission?

A No, I haven't.

Q What are your qualifications, Mr. Street?

A I received a Bachelor of Arts in 1949 and a Master of Arts in 1951 in geology from the University of Missouri. I worked for the Pure Oil Company for three years from 1951 to 1954 in the four corners area. After leaving the Pure Oil Company I went to work for Pubco Petroleum Corporation in 1954 in the San Juan Basin of New Mexico. I have worked for Pubco eight years and am now chief geologist for this firm.

Q Are you familiar with Pubco's operation in the San Juan Field?

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A Yes.

Q What is Pubco's acreage position in the San Juan Basin at the present time?

A Pubco has approximately 40,000 acres under lease in the San Juan Basin.

Q Does Pubco plan to drill any wells in the San Juan Basin in 1962?

A Approximately 18 wells are scheduled for this year.

Q What is the total number of wells Pubco has an interest in and operates in the San Juan Basin at the present time?

A Pubco has an interest in 162 and operates a total of 81 gas wells.

Q Does Pubco operate any Dakota gas wells in the San Juan Basin?

A Yes, nine at this time.

Q State the present average depth of those Dakota wells.

A Approximately 6800 feet.

Q Will you state the average deliverability of Pubco's Dakota wells?

A The average deliverability is about 1700 MCFGPD with associated distillates.

Q How does this compare with the average Basin-Dakota deliverability?



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A Pubco's average is about the average for the surrounding operators.

Q Can you state Pubco's position relative to the proper proration formula testified to here yesterday and the day before?

A In the opinion of Pubco Petroleum Corporation, the present proration formula, based on 75% acreage times deliverability plus 25% acreage has proved to be a workable formula, a 100% deliverability would allow each well to produce according to its deliverability. The deliverability is directly proportionate to the recoverable reserves under each well. A hundred percent deliverability would provide a more equitable proration formula. Pubco opposes any proration formula which favors acreage factors as the proposed 60% acreage plus 40% acreage times deliverability.

Q Can you state to the Commission your reasons for the opposition to the proposed change?

A The first objection I have to the proposed change in the proration formula is that all the acreage within the Basin-Dakota Gas Field is not of equivalent value and should not be considered as such in a proration formula. It follows that if a large acreage factor is included in the proration formula it will be detrimental to the correlative rights due to the fact that operators will not be allowed to produce their fair share of the gas for available market in relation to their reserves.

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The present formula provides more than adequate acreage consideration, and this acreage factor is in itself a minimum allowable. Secondly, a large acreage factor in the proration formula reduces the incentive to search out those areas which will produce gas commercially. It is economic waste to drill wells which will not return the well costs. A formula based upon 100% deliverability would be the premium offered to the operator who seeks good sand developments and porosity trends, or who attempts to improve completion techniques.

The third objection to the proposed change is that investments have been made in exploration acreage and well costs in the San Juan Basin on the basis of the present proration formula. Any change will work an economic hardship on the companies who have made these investments. Definite efforts have been made by most operators to be selective in their investments. It does not appear reasonable to change the proration formula so that areas which have been proved to be economic become marginal in order to bring other areas which are uneconomic up to a marginal status. During a period of low market demand all producers will not realize a good return. However, when the market is good problems are minimized. The incentive to search for the commercial hydrocarbon accumulations should be maintained.

Q I believe you stated earlier that all the acreage in

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the Basin-Dakota Gas Field is not of equivalent value. Are you prepared to prove this statement?

A Yes. The parameter I wish to present on the Basin-Dakota Gas Field of the San Juan Basin of Northwestern New Mexico is that of sandstone thickness. This variable is very important in that without a reservoir present in the bore hole the result of the test will be a dry hole. If there is a varying thickness in reservoir, the quantity of hydrocarbon reserves will increase or decrease providing the other reservoir parameters remain constant. These major variables are porosity, permeability, saturation and pressure. In plain language there must be a container present in a well bore in which hydrocarbons may be stored and produced from in order to complete the well as a commercial producer.

I have, or have had a series of maps and cross sections of the producing portion of the San Juan Basin, Basin-Dakota Gas Field prepared, which I would like to present. These will illustrate the thickness variation of the Dakota formation.

Q Were you in charge of the preparation of these exhibits?

A Yes.

Q And to the best of your knowledge and belief do they truly reflect actual conditions?

A Yes.



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Q At this time I will ask you to produce one of the exhibits.

MR. KELEHER: May I ask the Commission at this time if the witness is accepted as being qualified?

MR. PORTER: Yes, sir.

MR. KELEHER: I will ask you at this time, Mr. Street, to mark that exhibit Pubco No. 1.

(Whereupon, Pubco's Exhibit No. 1 was marked for identification.)

Q (By Mr. Keleher) Directing your attention to the Exhibit No. 1 for Pubco, I will ask you to state what it is.

A This is a map of a Dakota isopach map of the gross producing sandstone in a portion of the Basin-Dakota Gas Field of the San Juan Basin, New Mexico. The isopach interval is 20 feet. The map shows all of the holes' producers as well as dry tests drilled through the Dakota in this portion of the Basin-Dakota Gas Field to February 15, 1962. The dry holes are shown with double circles. The drilling wells are not shown.

There were 474 electric logs used in the preparation of this study. To aid in the interpretation of this map, a three-fold color system has been used. Less than 40 feet of gross thickness is colored in yellow, from 40 to 60 feet is colored green, and 60 feet and thicker is colored red. These are the various colorings. I wish to define the term gross sandstone as used in this



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study. Gross producing sandstone, as used in this study, includes any zones which have been perforated or open to the casing. If the electric log indicates a sandstone or shaley sandstone, the log thickness has been used. The gross perforated interval has not. The gross producing sandstone thickness is not to be construed to mean that we have definite knowledge that all of the zones are contributing to the production of hydrocarbon, but that there is the mechanical possibility they are productive.

I wish to point out that there is a major difference in gross sandstone thickness and net reservoir thickness. The net reservoir thickness requires the knowledge of porosity, water saturation and permeability; these data require core analysis information as well as a good set of electric logs to set up an interpretable parameter for the various net reservoir values.

I believe that the difference between net reservoir and gross producing sandstone thickness can best be illustrated by an example. A gross sandstone bed may be 50 feet thick, but because of no permeability, low porosity or high water saturation, only 25 feet is capable of producing hydrocarbons. Thus, the gross would be counted as 50 feet, but the net thickness will only be 25 feet. Because of the magnitude of the study and technical knowledge of the reservoir parameters required, a net reservoir analysis has been made of the wells along the cross

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sections only.

I believe the gross sandstone study, as presented, adequately illustrates the variance in the Dakota formation to justify disallowing a large acreage factor in a proration formula. I have mentioned the parameters of permeability, porosity, water saturation, and another important parameter is thickness, which this map depicts. The quantity of net sandstone is important, along with quality, in order to have commercial hydrocarbon accumulation.

This gross sandstone isopach map cannot be used for reserve calculations. However, it does represent the maximum possible thickness or quantity of sandstone in the well bore. Inasmuch as the gross thickness is always as much or greater than the net reservoir thickness, it follows that any variation in gross thickness also means a variation in net thickness.

This map illustrates the lateral changes in thickness of the Dakota sandstone in the proved productive areas. It further indicates the thinning of the gross sandstone beds around the outer margins of these productive areas. As you can see, in all of these productive areas there is a shading down into yellow from the thickest portion which is red in all of the producing areas. The lack of the reservoir beds around the margins of the producing areas is also indicated by the presence of the dry holes which I have mentioned earlier that are shown in double

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circles.

Q Do you have another exhibit that might be identified as a companion exhibit?

A Yes, I have.

Q I'll ask you to place it on the wall and identify it as Pubco Exhibit No. 2. After it has been placed on the wall, I would like you to state to the Commission what it purports to show and to ask you whether or not it was prepared by you and under your direction or supervision. I will ask you first to identify that as Pubco Exhibit No. 2.

(Whereupon, Pubco's Exhibit No. 2 was marked for identification.)

Q I will ask you whether or not that exhibit was prepared by you or under your direction and supervision?

A This cross section is an electric log cross section which was prepared under my supervision.

Q Does it, to the best of your knowledge and belief, reflect the actual conditions as you know them?

A Yes, sir. This cross section is an electric log cross section along the line labeled CC¹ as shown here on the isopach map, starting in the northwestern portion of the producing area and terminating in the southeastern portion. Each of the wells represented on this cross section have been assigned a number

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which is shown in its corresponding position on the isopach map so you may follow the line of section. This cross section shows the lateral variations within the Dakota formation on a gross aspect basis.

Q What is the purpose of submitting this exhibit identified as Pubco's 2 exhibit to the Commission?

A The purpose is to show on a gross basis, because this is a large field, these vertical and lateral variations which do occur in the Dakota formation.

Q The wells that are depicted on this Exhibit 2, are they identified?

A Yes, sir. I wish to discuss each well individually, if I may.

Q Proceed.

A First, I wish to point out that the Dakota formation has been defined by the Commission in Order R-1670-C, Rule 25, as follows: "The vertical limits of the Basin-Dakota Gas Pool shall be from the base of the Greenhorn limestone to a point 400 feet below the base of said formation and consisting of the Graneros formation, the Dakota formation and the productive upper portion of the Morrison formation."

This exhibit graphically represents the difference in gross producing sandstone and net. The well shown as No. 1 has been



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perforated over a great interval as is shown in orange, which will allow a large gross interval. However, the gamma ray log indicates the major portion of this interval to be a shaley sand, thus the net or effective reservoir thickness is small. The gamma ray portion of the curve is the dashed line along the normal SP track. The better portion of the sand is shown down here at the base, which gives the idea of the cleanliness of the sandstone, and the reduction in this curve to the right indicates the increase in shaliness.

Q Whose well is that?

A This well is the Consolidated Oil & Gas O'Shea No. 1, located in the Southwest Quarter of Section 3 of Township 31 North, Range 13 West. In this well a large portion of the Dakota section has been perforated. However, the more massively developed sandstone bed is located, as I mentioned earlier, at the base of the formation.

Just as a matter of interest, a gross thickness of 101 feet has been open to the bore of this well, but the net reservoir is 26 feet. The reported IP is 1,825 MCF. Well No. 2, which is located here and in the cross section right here is the Southwest Production Company Raymond Simmons No. 1, located in the Southwest Quarter of Section 17 of Township 30 North, Range 11 West. It is approximately 12 miles southeast of Well No. 1.



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As can be seen on this cross section, the producing horizon is located at the top of the Dakota sandstone and is represented by 27 feet of gross interval as compared to a net reservoir thickness of 25 feet. The reported IP on this well is 3,106 MCF. Even though the gross perforated interval is approximately one-fourth the amount perforated in Well No. 1, a comparison of net reservoir thickness shows them to be essentially equal, and the IP of Well No. 2 is almost twice as great as Well No. 1.

Well No. 3, which is this well here, is located in the central portion of the better producing area of the Basin-Dakota Gas Field which is locally called the Angel Peak Pool. It is the Pan American Petroleum Corporation J. C. Davidson F-1, located in the Southeast Quarter of Section 28 of Township 28 North, Range 10 West. It is located approximately 14 miles south, southeast of Well No. 2.

As can be seen on the log, the producing horizon is again located in the upper portion of the Dakota sandstone and is represented by a massive sandstone body occupying a gross interval of 84 feet. I wish to point out that it is obvious from the electric log qualities that this sandstone possesses better reservoir characteristics than the previous two logs. The net reservoir thickness is 51 feet. The IP on this well was 5,981 MCF.

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Well No. 4, which is a dry hole located here on the cross section and approximately at the end of a producing area is the Kay Kimball Liberman No. 5 located in the Southwest Quarter of Section 19, Township 26 North, Range 7 West. This test, as I mentioned, is a dry hole and the electric log, as illustrated here on this cross section indicates the lack of reservoir beds. To me, a dry hole with a complete lack of reservoir section is real proof that all of the acreage in the San Juan Basin is not of equal value or potential, which again more than justifies the omission of an acreage factor in the proration formula. Very little more can be said on this well in that if there are no producing horizons present in the Dakota formation, it is obvious that the well is incapable of producing any allowable.

Well No. 5 is this one located thusly on the isopach map as the Pan American Petroleum Corporation Jicarilla Contract 147 No. 3, located in the Northeast Quarter of Section 6 of Township 25 North, Range 5 West. This well is approximately $12\frac{1}{2}$ miles east, southeast of test No. 4. As shown on the log, this well was completed in a reservoir development referred to as the Graneros, which immediately underlies the Greenhorn formation.

The gross pay interval in this well is 16 feet, the net reservoir thickness is 7 feet, the reported IP on this well is 1,077 MCF. I believe it is obvious to all of you viewing this

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cross section that this well is producing from an interval that is stratigraphically higher than any of the producing zones on the previously discussed wells. This illustrates the wide vertical variation in the producing section of the Dakota formation in the San Juan Basin. It is entirely possible, I suppose, that additional production might be obtained from the Dakota portion of this well which is in here as evidenced by the log character. However, I can only consider this as a matter of speculation in that certainly Pan American Petroleum Corporation is a capable operator, and if they considered it worthwhile they would have considered a completion in this portion of the Dakota.

Well No. 6, which is located here on the cross section and is here on the isopach map, is the Skelly Oil Company Farming 1-E, located in the Northeast of Section 2, Township 24 North, Range 6 West. It is approximately $6\frac{1}{2}$ miles south, southwest of Well No. 5. As is shown on this cross section log, this well is producing from a lower massively developed sandstone member of the Dakota formation, which is located here, and the other well is located, producing from the Graneros.

This, again, indicates the wide variation of reservoir position in the stratigraphic sequence of the Dakota. This well has a reported IP of 3,050 MCF and has a gross producing interval of 61 feet. The net reservoir thickness is 32 feet, the electric



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log characteristics indicate possible pay zones above the producing horizon which have not been included in the gross sandstone thickness, these intervals in here, inasmuch as they are not at the present time contributing to the gas production from this bore hole. I believe it is rather apparent in comparing just these two logs, 5 and 6, that they would not be of equal dollar value. If they are not equal in value because of reservoir thickness alone, is there any justification for an acreage factor in the deliverability formula?

Well No. 7 is the Sunray Mid-Continent Apache No. 1 located in the Southwest Quarter of Section 21 of Township 23 North, Range 5 West, and located 10 miles southeast of Well No. 6. Well No. 7 appears to be more similar in character to the Well No. 1 in that the apparent log characteristics indicate the poor reservoir quality existing in this bore hole. There has been a gross productive interval of 69 feet perforated in this well as compared to a net reservoir thickness of 14 feet.

The reported IP is 520 MCF, the major and most apparent item in all of the logs studied in this cross section to this point is that there's a wide variation in the producing intervals and that there is not an absolute correlation of gross perforated sandstone interval with the production. However, it is readily apparent that the better reservoir development, as indicated on

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these electric logs, has resulted in the better wells.

Well No. 8, which is the last one, is the Pubco Petroleum Corporation Jicarilla 23-5, located in the Southwest Quarter of Section 23 of Township 23 North, Range 5 West. This well is located approximately two miles east of Well No. 7. A comparison of logs from Well No. 7 and No. 8 indicates a more massive sandstone present. This well lacked permeability, and even after a large frack job, production was not obtained from Well No. 8. This test illustrates the earlier statement that thickness or quantity is only one consideration for obtaining a commercial well.

To sum up these exhibits, the isopach and cross section, I believe it is readily apparent that over a large horizontal segment of the Basin-Dakota Gas Field there are many discreet producing reservoirs in the Dakota stratigraphic sequence. The isopach map has shown the horizontal variations in the thickness of the gross producing sandstones, and this cross section CC¹ shows the vertical variations. It is, therefore, evident that an acreage consideration of any magnitude provides an injustice to a prudent exploration and exploitation plan of operation in the San Juan Basin. We have observed the horizontal and vertical variations within the Basin-Dakota Field. I wish to further illustrate the vertical and horizontal variations within the Dakota formation on a more localized area. I wish to introduce another exhibit.

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Q Do you have another exhibit which you have prepared?

A Yes.

Q I'll ask you to place the next exhibit on the wall and identify it as Pubco's Exhibit No. 3.

(Whereupon, Pubco's Exhibit No. 3 was marked for identification.)

Q Would you mark that Pubco Exhibit No. 3?

A Yes, sir, I have.

Q Was that Exhibit 3 prepared under your personal direction and supervision?

A Yes, sir.

Q Do you state to the Commission that it correctly depicts and sets forth the situation that it purports to indicate?

A Yes, sir, it does.

Q Now, state to the Commission what that Exhibit 3 might be.

A Exhibit No. 3 is an electric log cross section along line AA¹ as shown on this isopach map, which is a southwest-northeast line of section, and this line of section was selected because of the continuous well control across the best productive area. The wells are located on the conventional northeast and southwest spacing pattern. Consequently, there's approximately the same distance between wells along this line of section. These logs have been correlated using the base of the Greenhorn

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formation as a stratigraphic datum inasmuch as that point is referred to as the top of the Dakota formation by definition.

Only the perforated sandstone intervals have been counted along this cross section for the gross sandstone thickness. These intervals are shown on the cross section in orange. It is identical in preparation to Exhibit No. 2. Well No. 1 on the cross section AA¹, which is this well, is the Southwest Production Company Mudge Federal No. 6, located in the Northeast Quarter of Section 32, Township 27 North, Range 11 West. This well has a gross perforated sand interval of 25 feet, the net sand interval is 21 feet.

Well No. 2 is the Frontier Refining Company Frontier-Aztec B 1-D located in the Southwest Quarter of Section 28 of Township 27 North, Range 11 West. This well has a gross sandstone interval that has been perforated for production of 30 feet, with a net of 14 feet.

Well No. 3 is the Frontier Refining Company Bolack D-4, located in the Northeast Quarter of Section 28 of Township 27 North, Range 11 West. This well exhibits the lateral and vertical variations in the Dakota in that the southwest offset well No. 2 has a gross sandstone thickness of 30 feet which has thinned down to the gross thickness of 14 feet in Well No. 3. But there is a member overlying this horizon in Well No. 3 which

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has a gross thickness of 15 feet and a third sand below the major horizon which exhibits a gross thickness of 35 feet.

I wish to point out that this lower sand is not present in the offset well to the southwest. The net sand thickness in Well No. 3 is 42 feet as compared to a gross sand interval of 64 feet.

Well No. 4 is the Southwest Production Company Hancock Federal No. 1, located in the Southwest Quarter of Section 22 of Township 27 North, Range 11 West. In this well the major sand body has a gross thickness of 39 feet, as compared to 14 feet in Well No. 3, and the lower sand body in Well No. 3 has thinned from 39 feet to 19 feet.

The gross sand thickness open to production in Well No. 4 is 58 feet and has a net sand thickness of 34 feet.

Well No. 5 is the Southwest Production Company Scott No. 8 Well located in the Northeast Quarter of Section 22, Township 27 North, Range 11 West. This well has a gross sand thickness of 32 feet in the major sand body, and the lower sand body as found in well No. 4 is missing. Here in a distance of approximately one mile we see a nice sand development in Wells No. 3 and 4, and it is absent in Wells 2 and 5.

The gross sand thickness open to production in Well No. 4 is 32 feet compared to a net thickness of 29 feet.



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Well No. 6 is the Southwest Production Company Hancock Federal No. 2, located in the Southwest Quarter of Section 14, Township 27 North, Range 11 West. The gross sand thickness in this well is 36 feet, which compared to a net of 23 feet.

Well No. 7 is the British American Corporation Fullerton No. 8, located in the Northeast Quarter of Section 14 of Township 27 North, Range 11 West. This well has extremely poor sand development in the Dakota formation. And, as can be seen from this perforated interval as indicated on the log of 66 feet, a considerable section was opened to the bore hole in an attempt to establish production. However, it was unsuccessful and was plugged in the Dakota.

This test is offset to the southwest and northeast by producers. Yet it is not capable of producing hydrocarbons in commercial quantities from the Dakota formation even after stimulation. This illustrates the point that one must have a reservoir present in the bore hole in order to obtain production, and that by any acreage allocation this test would have an allowable which it obviously could not meet.

Well No. 8 is the Pan American Pipkin No. 11, located in the Southwest Quarter of Section 12, Township 27 North, Range 11 West. This well has a major sand development in the top of the Dakota formation which has a gross thickness of 30 feet as



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compared to a net thickness of 15 feet.

Well No. 9 is the Pan American Pipkin No. 12, located in the Northeast Quarter of Section 12, Township 27 North, Range 11 West. The total sand development open to production is 32 feet, which corresponds to a net thickness of 12 feet.

Well No. 10 is the Pan American Volt J-1 located in the Southwest Quarter of Section 6, Township 27 North, Range 10 West. The sand development in the upper portion of the Dakota has increased over Well No. 9, and in Well 10 has a gross thickness of 37 feet. The sand development in the upper portion of the Dakota has increased over Well No. 9, and in Well 10 has a gross thickness of 37 feet with a corresponding net of 20 feet.

Well No. 11 is the Sunset International Kutz Federal 2-J, located in the Northeast Quarter of Section 6, Township 27 North, Range 10 West. In the major sand body there is a gross thickness open to production of 36 feet and additional zones overlying this interval in the Graneros have been opened, one of six feet, the other of ten feet, making a gross thickness open to production of 52 feet, as compared to a net of 36 feet.

Well No. 12 is the Sunset International Kutz Federal A No. 1, located in the Southwest Quarter of Section 32 of Township 28 North, Range 10 West. This well has a thicker major producing interval, having a gross thickness of 46 feet, and immediately

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below this development there is another pay interval of 19 feet, and yet another of 6 feet. Both of these lower sands are either not present or are poorly developed in the offset southwest and northeast well bores. There is a gross thickness of 71 feet as compared to a net of 47 feet.

well No. 13 is the Pan American Fred Feasel No. 1-L, located in the Northeast Quarter of Section 32 of Township 28 North, Range 10 West. The major sand body that is indicated to be present in nearly all of the wells in this cross section is indicated to be thickening in this well and has a gross thickness of 58 feet as compared to a net of 34 feet.

Well No. 14 is the Pan American Davidson F-1, located in the Southwest Quarter of 28, Township 28 North, Range 10 West. This well shows the nice increase in thickness of this major sandstone bed, and the same bed which is 58 feet in Well No. 13 has a gross thickness of 84 feet and 14, the net thickness is 51 feet.

well No. 15 is the Sunset International Kutz Federal No. 1, located in the Northeast Quarter of Section 28 of Township 28 North, Range 10 West. The major sand body is found in Well No. 14, has thinned from 84 feet to 65 feet in Well No. 15. However, additional zones have been perforated both above and below this major reservoir body. Two zones above have respective gross thicknesses of five and eight feet, while the three zones below have



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respective thicknesses of 6, 10 and 11 feet, making a gross total of 105 feet. However, in this particular bore hole the net is counted as 53 feet. It is apparent that even though considerable section has been open to production in this bore hole, Wells No. 14 and 15 have essentially the same net reservoir thickness.

Well No. 16 is the Kingwood Oil Kutz Canyon No. 1, located in the Southwest Quarter of Section 22 of Township 28 North, Range 10 West. The major sand body in this well is 66 feet, with one zone above of 13 feet and one zone below of 13 feet, making a gross sand thickness of 92 feet and net thickness of 69 feet.

Well No. 17 is the Pan American Davidson H No. 1, located in the northeast corner of Section 22 of Township 28 North, Range 10 West. This well has a gross producing thickness of 59 feet, with a corresponding net thickness of 52 feet. It is illustrated here on the cross section that the major sand body is thinning to the northeast as well as to the southwest.

Well No. 18 is the Aztec Oil & Gas McClanahan D-15, located in the Southwest Quarter of Section 14, Township 28 North, Range 10 West. The major sand body has thinned from 59 feet in Well No. 17 to 38 feet in Well No. 18. The Graneros section has been opened to production in this bore hole and has a gross thickness of 11 feet, which makes a total of 49 feet of gross sandstone as compared to a net thickness of 41 feet.

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Well No. 19 is the Aztec Oil & Gas McClanahan D-19, located in the Northeast Quarter of Section 14, of Township 28 North, Range 10 West. The gross thickness open to production in this bore hole, which includes major sand development and the Graneros section, is 52 feet, as compared to a net thickness of 36 feet.

Well No. 20 is the Pubco Petroleum Corporation State No. 29, located in the Southwest Quarter of Section 36 of Township 29 North, Range 10 West. The gross sand thickness open to production in the bore hole is 75 feet with a corresponding 44 feet of net reservoir. The major sand body has thinned from a thickness of 38 feet in Well No. 19 to 24 feet in Well No. 20. However, three additional zones are present in the bore hole of No. 20. The upper one has a gross thickness of 18 feet and the lower two zones have 21 and 22 feet respectively.

Well No. 21 is the Pubco Petroleum Corporation State No. 28, located in the Northeast Quarter of Section 36 of Township 29 North, Range 10 West. There's a total of 83 feet of gross sand open to production in this well bore from seven beds, as compared to a net thickness of 32 feet. I believe it is obvious to all of you viewing this cross section that the major sand body has major variations in thickness, and the various sandstone beds have definite limitations. There is a common well in Exhibit



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No. 2 and Exhibit No. 3 which depicts the northwestern thinning of this major sand body. This comparison on cross section CC¹, is with log No. 3, which is the common log in both cross sections, and log No. 2, and here, the comparison, and there is nearly 14 miles difference between these two wells, and in Well 2 there was a gross thickness of 27 feet and in Well 3 of 83 feet.

Also there are several examples of erratic sand development overlying and underlying this major sand body, which do contribute hydrocarbon to the well bore. Here again, in a local area we can see the horizontal and vertical variation in the Dakota formation which will affect the reserves of each individual well. Since 320 acres are allocated to each of these wells, an acreage factor of 320 remains equal. However, the reservoirs are certainly not of equal value. Test No. 7, which is a dry hole, is certainly not of comparable value to offset wells 6 and 8, and they in turn are not of equal value with Wells 13, 14 and 15 in the major portion of the Angel Peak sand development.

It should be readily apparent from this localized cross section why it is more desirable to have a proration formula based on deliverability which is directly related to the reserves rather than on an acreage consideration plus deliverability.

I would like to present another cross section which further illustrates the lateral variation of the Dakota formation.



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Q I would like you to take the proposed exhibit and place it on the wall and identify it as Exhibit No. 4.

(Whereupon, Pubco's Exhibit No. 4 was marked for identification.)

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

(whereupon, a recess was taken.)

MR. PORTER: The meeting will come to order, please.

Mr. Keleher, would you continue with your examination of the witness?

Q (By Mr. Keleher) At the time that the recess was taken, Mr. Street, I think you were going to introduce another exhibit.

A Yes, sir, I have placed it on the exhibit board at your request and have marked it Exhibit No. 4.

Q Will you state whether or not that was prepared by you and under your supervision and if you know that correctly delineates what you purport to testify to?

A Yes, it does.

Q Can you explain to the Commission what it does purport to show?

A This Exhibit No. 4 is cross sectioned along the line BB¹, which is shown here on the isopach map. It's a very short interval. This cross section has been prepared in the same manner as the previous two, in this case only three wells were used,

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located in Sections 25 and 26 of Township 27 North, Range 12 West.

Q Why were those wells selected?

A Because they are offset well locations as indicated on the index map here. They're drilled on the normal southwest, northeast spacing pattern as has been approved for the Dakota.

Well No. 1 is the Southwest Production Campbell Federal No. 3 located in the Southwest Quarter of Section 26, Township 27 North, Range 12 West. Well No. 2 is a Southwest Production Company Campbell Federal No. 2 located in the Northeast Quarter of Section 26 of Township 27 North, Range 12 West.

Well No. 3 is the Southwest Production Company Campbell Federal No. 1 located in the Northeast Quarter of Section 25 of Township 27 North, Range 12 West. There is approximately 4,000 feet between each of these wells on the normal northeast, southwest quarter spacing. Being offset wells, one would expect relatively consistent thicknesses in the productive horizons. However, this is not the case. It is obvious that in Well No. 1 two beds, or beds No. 2 and 3 have a gross thickness of 28 feet, as compared to the gross thickness of 54 feet in beds 2 and 3 in Well No. 2. These two beds in Well No. 3 are represented by gross thickness of only 20 feet.

This small cross section, then, shows the rapid lateral changes which do occur in the Dakota formation in that wells on

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either side of Well No. 2, Wells No. 1 and 3 have less than one-half the gross thickness in the same beds as found in Well No. 2. The net reservoir thickness on these wells is as follows: Well No. 1, 11; Well No. 2, 38; Well No. 3, 13; thus showing the same sharp lateral variation as the gross sand thickness.

I believe that it has been adequately demonstrated that there are many lateral variations in the Dakota formation in the Basin-Dakota Gas Field, and that the better wells occur in the better sand development, whereas dry holes have been drilled around the margins of these areas where the sandstone development is less and constitutes a poor reservoir.

With this proved lateral variation in the thickness parameter, it is obvious that reservoirwise all the well locations in the Basin-Dakota Gas Field cannot be of equal value, and as a consequence reserves present in a bore hole should be the basis for proration formula, in my opinion the variations in deliverability from well to well in the Basin-Dakota Gas Pool is directly reflective of the actual differences in reserves. Thus, the reserve index deliverability should be used.

To further the statement that all the acreage within the Basin-Dakota Gas Field is not of equal value, I would like to present another exhibit.

Q Can you place that exhibit on the wall, please, and

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mark it Pubco Exhibit No. 5?

(Whereupon, Pubco's Exhibit No. 5 was marked for identification.)

Q I will ask you to state to the Commission what that purports to show, Exhibit 5.

A This exhibit is a contoured deliverability map based on the 1961 deliverabilities for the Basin-Dakota Gas Field.

Q Was that Exhibit 5 prepared by you or under your direction and supervision?

A Yes, it was.

Q Do you know of your own knowledge that it reflects the testimony that you propose to give?

A Yes, it does. The data for this map is from the 1961 Oil and Gas Conservation Commission deliverability schedule covering some 491 Dakota gas wells. The reported deliverability numbers are shown on the map by the corresponding well. As in the gross sand isopach map, a three-fold color scheme has been used to aid in the interpretation. Deliverabilities of less than 500 MCF are colored in yellow, from 500 to 1,000 MCF are colored in green, and deliverabilities above 1,000 MCF are colored in red.

The red, as shown on this deliverability map, indicates the better producing areas of the Dakota formation, which corresponds

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to red areas or thicker gross sand areas observed on the isopach map or Exhibit No. 1. There's a reduction in the deliverability which compares to a thinning of the gross sand development towards the margins of these individual producing areas. Because of the correlation of deliverability and gross thickness over such a vast area, I believe that the relationship between the reservoir parameter thickness, which is one of the major reserve considerations, correlates with deliverability.

This tends to support the premise that well deliverability is an index to the reserves attributable to a bore hole, and that it is justifiable to use the deliverability as the major parameter in a proration formula.

I wish to briefly sum up the testimony which I have presented. Exhibit No. 1, the gross producing sandstone isopach map shows the lateral variations within the producing areas of the Dakota formation. Exhibit No. 2, which is cross section CC¹ shows the vertical variations within the Dakota formation over a large area. Exhibit No. 3, cross section AA¹, illustrates the vertical and lateral changes of the Dakota formation through the better producing area of the Basin-Dakota Field. I might add it is a localized cross section on which there are no extrapolations, every well site has been drilled that can be on a 320-acre spacing.

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Exhibit 4, cross section BB¹ shows the rapid lateral changes between offset wells. Exhibit No. 5, the 1961 deliverability map shows the better producing areas of the Basin-Dakota Gas Field which correspond to the thicker sandstone developments as shown on the isopach map. Through the use of these exhibits it has been shown that the Dakota formation reservoirs vary laterally, vertically, in thickness and in quality. Dry holes have been drilled throughout the proved Dakota gas producing area of the San Juan Basin, and these in themselves have been testimony to the fact that not every well which penetrates the Dakota formation will be a commercially productive gas well.

Because the Dakota is not a homogenous and continuous reservoir, which I feel has adequately been illustrated by these exhibits, it does not appear justifiable to have a proration formula with acreage as a consideration in that a hole incapable of producing or incapable of producing gas at a commercial rate is, in effect, a dry hole and should not be given an imaginary allowable.

Q How many years did you work in the San Juan Basin, Mr. Street?

A About five years.

Q You were there personally for five continuous years?

A Yes, sir.

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MR. KELEHER: At this time we would like to offer in evidence Pubco's Exhibits 1, 2, 3, 4 and 5.

MR. PORTER: Is there objection to the admission of these exhibits?

MR. KELEHER: We have no further questions of this witness.

MR. PORTER: The exhibits will be admitted.

MR. STOCKMAR: Ted Stockmar for Consolidated Oil & Gas.

CROSS EXAMINATION

BY MR. STOCKMAR:

Q Mr. Street, I believe you testified that the deliverabilities be directly proportionate to the reserves under the well, is that correct?

A Yes, sir.

Q What do you mean by the reserves under the well?

A Those reserves which may be recovered by that particular bore hole.

Q By that particular bore hole?

A Yes, sir.

Q Is this without respect to the spacing order?

A In what respect.

Q Are you saying that the reserves attributable to a well include all of the gas that you can cause to flow out of

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that well?

A No, sir. The reserves under the 320-acre spacing unit.

Q How do you control the well so that you produce only the gas under that 320 acres?

A That is one of the reasons for the proration formula, to protect correlative rights.

Q What is your definition of a commercial well?

A I don't believe that I'm in a qualified position to define a commercial well.

Q You testified that certain wells would be commercial and other wells would not be commercial, and that the conservation depended on the operators seeking out only the commercial wells.

A I believe that has best been illustrated by preceding testimony in which various operators have various operating costs.

Q But you have no opinion as to what constitutes a commercial well?

A I might say do not.

Q You do say, however, that conservation would best be served by the operators seeking out the commercial wells and leaving the non-commercial areas alone, is that correct?

A That is correct.

Q If there is gas under the non-commercial area, then you



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do not recommend drilling it nonetheless?

A If it is unrecoverable gas I don't think that it is possible to get it out. Gas in place does not mean that it is recoverable gas.

Q Those big white spaces on your chart there, is there gas under those?

A Sir, we are discussing that which has been proved, not which may become a matter of speculation.

Q Do you know whether or not there is gas under that area?

A I personally do not.

Q How you going to find out?

A By use of our exploration techniques Pubco has tried to follow in the past and will continue to follow.

Q Does that include drilling a well?

A If the geological considerations are such it would justify it, yes.

Q If you do not drill a well, will you know whether or not there is gas there?

A That is true.

Q So, if drilling is discouraged in those areas because you don't know whether or not there is gas there, we are not fully exploring the reservoir, are we?

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A It depends on whether you are seeking commercial production or just for drilling the holes themselves.

Q Pardon?

A I say it all depends on whether or not you are seeking commercial production or just drilling the holes.

Q Does your understanding of commercial production include the concept that the amount of gas that you can or are allowed to produce depends upon the allocation formula?

A That is true.

Q Then a well which might be nearly commercial under one formula might be completely commercial with an adjustment of that formula, is that correct, if the well will produce the gas?

A That would be a matter of mathematics, and I believe it has been testified that mathematically you can prove just about anything you wish.

Q I think I said that. When you say Pubco has a program, an exploration program of looking for commercial wells only, does that mean high deliverability wells, is that it?

A Those wells which would have commercial reserves, which in this case would compare with high deliverabilities.

Q How can you tell where you can find high deliverabilities?

A As I say, our exploration program attempts to delineate

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those areas and we drill accordingly.

Q Have you concluded your program or not?

A No, we have not.

Q These two exhibits, which I believe to be Pubco Exhibit 1 and Pubco Exhibit 5, you have used as a comparison between gross sand thickness and deliverabilities, is that correct?

A Yes, sir.

Q And you say that there is a relationship demonstrated by this map?

A I believe that it is rather apparent to anyone observing the two exhibits that there is a relationship of the areas colored in red corresponding.

Q They are not identical, are they?

A Not on a line for line basis, no, sir.

Q What are you attempting to prove by comparing gross sand thickness with deliverabilities?

A The reason that gross sand was used was to show the maximum amount of potential reservoir present which would be giving everyone the benefit of any doubt, and the thickness being a parameter in reserves, which is a major consideration.

Q The gross thickness is?

A No, a thickness is. I am saying gross thickness was used because that gives us the ultimate or the most optimistic

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quantity that could be anticipated. I think I have mentioned in my testimony that the gross sand map could not be used for reserve calculations. However, I have also stated in my testimony that the gross sand represents the maximum development that can be anticipated and the net sand cannot be, maybe as great, but never greater than the gross sand.

Q Well, only some part of the thickness as shown on your gross map contains net pay according to your interpretation?

A That is a gross sand isopach map and all numbers by the well symbols are gross sand thicknesses, not net, not necessarily net.

Q Is there producible gas in any part of that except what you've called net pay?

A Sir, I haven't called it net pay. I have used in the

Q In several dozens of wells you said there was a net thickness and gross thickness for each well?

A Which exhibits now are you referring to? Are you still on the gross sand map?

Q I'm still on your Exhibit No. 1.

A All right.

Q I asked, is only some part of the thickness which you have shown for each particular location net pay according to your definition?



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A Yes.

Q Have you shown on here what that net part is?

A No, I have not.

Q Does the part that is not effective net pay contain any recoverable gas?

A That, as I've mentioned, is a parameter which would be necessary to know before you could make a net reservoir analysis.

Q Does net pay mean the part of the sand that contains producible gas?

A Yes, sir.

Q And the rest of it is not net pay, is that right?

A If it is incapable of producing it would not be net pay.

Q Then it doesn't have any producible gas in it, is that right?

A That would be correct.

Q I thought you said that what we were comparing, that there was a direct relationship between reserves which is producible gas which must come from net pay and deliverabilities, is that not your testimony?

A Yes, sir.

Q What do these two exhibits show when you compare gross pay, something entirely different with deliverabilities?

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A As I've mentioned before, the gross pay sandstone isopach map would show the very maximum reservoir development that could exist in that bore hole consequently, and if there are any variations in the gross pay it is reasonable to expect variation in thickness of the net pay. In other words, I have used the greatest margin of optimism and it still correlates back to deliverability; as we have noted on the cross sections, there are some cases where the gross and net are essentially the same.

Q Is the net pay always the same fraction of the gross pay in all the wells?

A No, sir, it isn't.

Q Does it vary substantially?

A As I mentioned in my testimony, to arrive at a net pay you would need to know all the variables of porosity, permeability, saturations, pressure and thickness.

Q You are saying, then, that there is no easy common relationship between gross pay and net pay, is that right?

A No, sir, not necessarily.

Q Then we cannot use these two exhibits to show any relationship between net pay and deliverability, can we?

A I believe we can from the standpoint that if the maximum, the very maximum reservoir consideration is shown,



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knowing full well that the gross will have to be equal to or greater than the net, and you still see a correlation that that is reasonable justification for using this correlation.

Q You mean if all the gross pay contains producible gas, then we can use it, is that what you are saying?

A No, I am not. I am saying that the gross thickness, this one parameter for reserve calculations is represented on the map and it corresponds to the deliverability, then it must have a reasonable correlation to the thickness parameter.

Q You keep saying that gross pay is a parameter in determining reserve.

A Net pay is the parameter in determining reserves. Gross pay has been the number used in isopaching the productive areas of the Basin-Dakota Gas Field.

Q Have you made any similar maps to your Exhibit 1 covering net thickness?

A No, I have not. I have viewed others and like the correlation even better with the deliverabilities.

Q Would it not be a better way to demonstrate the relationship, if any exists, between net pay and deliverabilities?

A That is true.

Q That is true?

A Yes.

Q But you have brought these two instead?



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A That's right, because of the -- as I believe I have mentioned in my direct testimony, the magnitude of the study and the technical knowledge required in determining net pay.

Q Let's talk about net pay a little bit. How do you define net pay when you look at a particular well?

A The basis for log interpretation and for reservoir analysis is core analysis, or has been generally accepted as such, so that to have a proper consideration for determining net pay, one should have some core analysis data to correlate to the electric log, and therefore a good set of electric logs is required then to determine the net pay parameters or variables.

Q You have by some mechanism selected a net pay for all of the wells shown on Exhibits 2, 3 and 4, I believe they are. You have cores for each and every one of those wells?

A No, that has been a compilation or a study between the core analysis and the logs and an attempt at an empirical approach has been made to interpret well logs based on the core analysis and well log characteristics.

Q Let me ask first how many logs on Exhibit AA¹, or cross section AA¹, for example, how many of those 21 wells did you have cores to match up with your logs?

A At this moment I could not, there were only three wells



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with core analysis on this particular cross section.

Q One-seventh of those wells?

A Yes, approximately.

Q How many cores did you have on the seven wells shown, or eight wells shown on cross section CC¹?

A I do not have any.

Q You did not have any? A Right.

Q How did you determine the net pay of each one of these when you had no core?

A As I mentioned earlier, the relationship between the core analysis and the log run in a particular well bore is used, this comparison then is an empirical approach to try to arrive at an interpretable net value.

Q In other words --

A It is an extrapolation.

Q -- from some comparison you can carry it over to another well and use the same comparisons?

A That is the approach.

Q When you do this, is it helpful if the reservoir is fairly uniform, the characteristics more or less the same?

A It would be very helpful.

Q I gather that if the characteristics are wildly different from each other, then this is not such a good method?



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A There would be complications and there may have to be adjustments accordingly.

Q Did you make those adjustments when you made all of the analyses of the eight wells on cross section CC¹?

A There's the attempt, yes.

Q You have testified that those are wildly variant from each other, have you not?

A I have testified that the thickness which is apparent on these cross sections are variable.

Q You have no logs with respect to those eight wells?

A The logs are on the cross section, so I believe it is obvious.

Q Excuse me, no cores with respect to those eight wells?

A That is right.

Q They're how many miles apart?

A I believe it is written between each well.

Q What's the total length of your cross section CC¹, seventy-five miles?

A I can calculate it for you in just a minute. Approximately seventy-six and a half miles from Well No. 1 to Well --

Q Were there any logs anywhere near this long, seventy-five miles that you did look at?

A Sir, I believe if you will --



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Q Excuse me, any cores of wells anywhere near this seventy-five mile line?

A I believe if you will recall, in the direct examination I pointed out that there is a common log in both cross sections from which to extrapolate from.

Q Was that well cored?

A No, this particular well was not cored, but it is, however --

Q Did you look at any cores in connection with your work in connection with CC¹, the cross section?

A No, sir.

Q So, then, your determination of net pay was entirely from the logs then?

A Yes, sir.

Q I think you said that one of the parameters for determining net pay was permeability, is that correct?

A That is correct.

Q Can you read permeability from those logs?

A No, sir.

Q Then you did not consider permeability of the well in finding your net pay?

A I believe you are probably aware that considerable work has been done on the Dakota by various logging firms which



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have attempted to come up with what they refer to as permeability indices.

Q But that is not your work?

A That is not my work. It is expert electrical log techniques.

Q Let's look at your Exhibit 2 from another viewpoint, that's cross section CC¹. Well, first I think you testified that what you show on the top of the chart over each log was the initial potential of the well.

A As reported.

Q As reported. Is that the same as the deliverability of the well?

A No, sir, it is not.

Q What's the difference between them?

A The initial potential is the test run upon completion of a well to find its initial productivity.

Q Is it as useful for your purposes here as deliverability?

A Not in this particular case.

Q Do they vary directly with each other?

A Not having made a definite study, I would not be in a position to say yes or no. However, I have talked to others who have compared initial potentials and deliverability and they

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inform me there is a similarity.

Q You have testified that reserves which are net pay, as you call it, varies directly with deliverability. Is it also your opinion that reserves vary directly with initial potential?

A No, sir, I am not extrapolating that far.

Q The only purpose of these three cross sections since there appears to be no apparent relationship between deliverability and the net pay, is to show the extravagant variation of the reservoir, is that correct?

A I believe if you will recall my testimony that the intent was to show the vertical and lateral variations within the Dakota formation.

Q Did you hear Mr. Trueblood's testimony yesterday?

A Yes, sir.

Q And Mr. Haseltine's today?

A Yes, sir.

Q With respect to their testimony on the variability of the characteristics of the reservoir, do you subscribe to that testimony?

A I believe if you will look at my exhibits it would be difficult for me to say that I do.

Q You disagree with their testimony then?

A Yes, sir.

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Q Referring for a moment to your Exhibit 3, and I would like to ask that we take down this last one, I think I'm through with that, so we can see the Exhibit 3 in full. As a matter of fact, just move it over on top of Exhibit 1, I think we will come back to it. I wish we had a light behind those so we could see how they do stack up. Mr. Haseltine, with his exhibits, specifically testified that there was a variation from tract to tract, that it was more or less gradual, that there were no substantial variations over short distances, was that not his testimony?

A That is as I understood it.

Q It appears to me, just from looking at that Exhibit 3, on an eyeball basis, that that's what we have. Where are these tremendous variations from section to section?

A What would you consider this, as a rather gradual change from one reservoir character to another in what appears to be overall a stratigraphically similar reservoir?

Q I would call that --

A How about the reservoir present here in well bore 3 and 4 as shown on cross section AA¹ which shows logs offsetting, from wells offsetting both to the southwest and to the northeast that does not have this sand development? I would say that appears to me rather abrupt.

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Q I gather that thing in the middle is a dry hole, is that right?

A Yes, sir.

Q Did they not encounter any sand whatsoever?

A From the log character it would appear that they might have had shaley sand.

Q Is that Dakota? A This is Dakota.

Q Well, you left it out because it didn't have any gas in it?

A I believe if you will read the definition, productive was used. This one is a dry hole, it is consequently not productive.

Q There is gross Dakota sand under that?

A Not gross productive Dakota.

Q Was all the rest of this gross productive?

A They are completed wells. That much is shown in orange.

Q My point is, there is not a complete break in the stratigraphy at that point.

A In their attempts to stimulate and obtain a well in Well No. 7, as shown on cross section AA¹, they failed to obtain commercial production.

Q Is their Dakota sand penetrated by that well?



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A From the log character, which I would like to bring to your attention, it's very poorly developed.

Q There is Dakota sand penetrated by that well?

A There would be some shaley sand, I suppose. The electric log is not the lithology log, however.

Q Then, except for the fact that it may not have had net pay in it, your gross sand does carry right on through, is that correct?

A There could be some gross sand encountered perhaps, but it is not gross productive pay, which is the definition used throughout this testimony.

Q In your judgment, does your map, did Mr. Haseltine's map show the same variation as your map does?

A Not having had an opportunity to study his map, I would not say.

Q Mr. Street, do you recognize this as a duplicate of Southern Union's Exhibit No. 1?

A As I say, not having had an opportunity to study it, I would not be able to truthfully say yes or no. However, I would assume so.

Q Just comparing the two in the broad perspective, do you see --

A Inasmuch as --



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Q -- substantial variations in yours that are different from his?

A Without a vertical or lateral scale, one couldn't determine very much of anything from this cross section.

Q Is your exhibit to scale?

A I'm not talking about to scale. I said without a scale. There isn't a vertical or lateral scale shown here.

Q Are you willing to assume that all of the things are measured by the same scale, whatever it is? Did Mr. Haseltine use a different ruler for each well?

A Well, there is a very definite different vertical scale on these cross sections as employed by Mr. Haseltine and myself, in that these are apparently traced curves showing only a well number and letter, whereas these are actual reproductions of the well logs which I have used.

Q To summarize this point, you say that your cross section is substantially different from his, that your Exhibit 3 shows great variation in the gross sand, is that correct?

A Yes, sir.

Q Does it show any variation with respect to the net sand?

A Yes, sir.

Q It does? Does the exhibit show it?

A It does not illustrate it. I have read it into the

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testimony.

Q It exhibits on its face --

A It does not.

Q Does not show the relationship of the net pay across the reservoir?

A No, sir.

Q Let's go back to Well No. 7, do you know the circumstances of the attempted completion of that well?

A Nothing more than what is reported by the commercial reporting services.

Q You do not know that it was fracked into the water below and the well was drowned out?

A That was not reported on the service, no, and it is my contention, I believe, as I said earlier, that a dry hole is in itself testimony that it is incapable of producing.

Q Have you checked the records of the completion report with respect to that well that's on file with the Commission?

A No, sir.

Q For us to see the variation in net pay from these three exhibits, then, we will have to take the figures which you testified to and do our own coloring so we can see the variation, is that it?

A If you wish.

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Q Well, with respect to the net pay, what, on Exhibit 3 what was your thinnest net pay and which well was that in?

A On cross section AA¹?

Q Yes, sir. My notes show it to be No. 9, if that will be of service to you.

A Twelve feet.

Q Twelve feet. Which is the thickest net pay?

A Well No. 16 with 69 feet.

Q What is the ratio of the thinnest to the thickest here?

A Well, it would be from zero to 69.

Q Pardon? A Zero to 69.

Q Or, you are including the dry hole?

A It has to be. It's included on this cross section.

Q What's the ratio? A From zero to 69.

Q I say ratio, not the range.

A In this particular case it would appear to me to be the same.

Q No, ratio, as I understand, is a fraction comparison of two numbers, is that correct? I mean one is something one inch thick and the other is two inches thick, the ratio is one to two, is that correct? Your ratio here is zero to 69, is that a fraction? Well, never mind. Have you calculated the average net pay across this section?



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A No, I have not.

Q Cross section AA?

A No, I have not.

Q Would you accept my calculation that the average net pay is 33.2 feet according to your own testimony?

A If you have done it mathematically correct that would be fine.

Q Looking at the averages here, do we have substantial variations --

A May I ask --

Q -- from the thickest well to the average well?

A Pardon.

Q What is the degree of the variation between the average well of 33.2 and the thickest well, 69 feet?

A The thickest well would have slightly greater than twice as much as the 33 feet which was given.

Q Ignoring this economic catastrophe in No. 7 here, and looking at well No. 9 which has 12 feet, I believe that to be the next lowest net pay. What is the ratio between the thickness of that well and the average well?

A Slightly less than three.

Q Less than three?

A Very slightly less than three. However, I wish to ask you a question, in terms of your 33 average, in that, did you use

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the zero as shown in Well No. 7 to include for the average of the total wells?

Q Yes, sir. Mr. Street, if there is any comparison at all between net pay, as you determine it, without core analysis and initial potential which you have shown on the map, how do you explain, or how do you rationalize the relationship say between Wells 6 and 11; Well No. 6 you say has a net pay of 23 feet, Well No. 11 has a net pay of 36 feet, half again as thick. The thin sand has an initial potential of 4849 MCFCGPD, initial potential of 4849, is that correct?

A Would you state that again?

Q Well No. 6 has an initial potential of 4849?

A 4849, yes.

Q And Well No. 11 has an initial potential of 2084, is that correct?

A Yes, sir.

Q Now, Well No. 6 where the net pay is only two-thirds as thick as Well No. 11 seems to have well over twice the initial potential. How do you reconcile this with your statement that there's a direct relationship between deliverability and reserves?

A I would appreciate your asking that question again so that I can follow through on here.

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Q If your exhibits are intended to support your statement that reserves vary with deliverability, or vice versa, the nearest that you have come is to bring forward net pay in lieu of reserve studies, and to bring forward initial potential in lieu of deliverabilities. Are you willing to substitute these two for each other for the purpose of these exhibits?

A No, sir, the purpose of this testimony was to show geologically not the reserve calculations, but the variables, stratigraphic variables within the Dakota formation.

Q Then, can the Commission completely ignore these Exhibits 2, 3 and 4 insofar as your testimony that reserves vary with deliverability is concerned?

A Excuse me. No, sir.

Q Where should they look on these to find this support for your testimony?

A For this one major parameter, thickness.

Q You have not shown the deliverabilities on here, have you?

A No, the deliverability map shows the line of cross section and each well is shown on that map with a corresponding number for the well on the cross section.

Q Is each deliverability shown --

A If it was on the 1961 Commission schedule.



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Q Well, if we compare your last exhibit, the deliverability map, with the net pay, will that support your testimony that deliverability varies with reserves?

A If you will take in the other factors.

Q Pardon?

A If you will take into consideration the factors that do exist along the cross section.

Q You testified that there was a direct relationship, are there other factors?

A The factor which I'm referring to is the amount of time which a well has been on production.

Q This enters into the determination of the reserves?

A If a well has produced so many million cubic feet of gas, I would say that has been recovered reserves.

Q Are there any other factors that must also enter into this direct relationship between deliverability and reserves?

A Well, as I've stated before, the parameters for reserves are porosity, permeability and saturation as well as the pressure and thickness, which this is only one parameter or variable which I have undertaken to illustrate.

Q Does area enter into the determination of reserves?

A The area is taken care of in terms of 320 acres.

Q I'm afraid I'll need your help, Mr. Street, to determine

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what the deliverability of -- why don't you just read off to me the different ones, if you will?

A I have it here at my seat. Now, what deliverability do you wish?

Q This is on Exhibit 3.

A 1961 deliverability.

Q I would like to have No. 1.

A It was not available.

Q Pardon?

A It was not on the schedule.

Q Is it included within your contours?

A No. 1 on cross section CC¹?

Q I'm sorry, AA¹, which is Exhibit 3.

A All right. On AA¹, Well No. 1 was not available. In other words, it was not on the 1961 proration schedule.

Q Is it included -- A The well log.

Q Is it used to contour your deliverability contour map?

A That was not considered for a control point, no.

Q No. 3. A Well No. 3?

Q Yes, sir. A Is 801.

Q Pardon? A 801.

Q No. 9? A 935.

Q No. 11? A 270.

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Q No. 13? A 224.

Q No. 14 and 15? A 918 and 1450.

Q No. 16? A 2365.

Q No. 18? A 6793.

Q Would you repeat No. 15? A 1450.

Q Thank you. Well, now, for our purposes you are willing to say that net pay is a measure of reserves and we can now compare net pay versus some of these deliverabilities?

A If you will take into consideration that gas which has been produced before these deliverabilities were run on these particular wells which were productive before 1961.

Q Would you make the comparison, please, between net pay and reserves as to Wells 15 and 18 for me, please? Would you describe the net pay and the deliverability?

A 15 and 18?

Q Yes, sir.

A 15 had a net of 52 feet, 1961 deliverability of 1450. Well No. 18, a net of 41 feet and a 1961 deliverability of 6793. Now, for the comparison between Well 15 and Well 18, Well 15 went on production in 1958, Well 18 went on production in 1960.

Q Are these deliverabilities based on tests made at the same time?

A These are 1961 deliverabilities of all the wells



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which have been included in these data, but that is not saying that I have been fortunate to find all wells were drilled simultaneously. No, there are some older producing wells in this cross section.

Q Well, does deliverability, according to your story, measure the original reserves in place or those available for production at any time?

A If you wish to try to compare direct net reservoir thickness and deliverability, that should be taken into consideration.

Q Well, has there been very substantial production by either of these wells, do you happen to know?

A Yes, sir. I answered your question. You asked if there was considerable production and I said yes, sir.

Q I am sorry. From each of the wells?

A Yes, sir. There, of course, is more production from the well that was producing in '58 than the one that went on production in 1960.

Q Well, we have these deliverabilities taken at the same time anyway.

A Which gives today's values.

Q You said there was a direct relationship between deliverabilities and reserves, correct?

A Recoverable reserves.



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Q You have Well No. 15 at 1450, we have Well No. 18 at 6793. That seems to be at least four, almost five times as great a deliverability for Well 18, is that correct?

A Well No. 18 has produced a year and a half longer.

Q I'm asking you with respect to the ratio of the deliverabilities.

A If you look at the testimony on the current and eliminate the earlier --

Q That's what I want to do.

A -- produced reserves.

Q I want to look at the current. Well No. 18 has a deliverability five times that of Well No. 15, is that not correct?

A Yes, under the present test.

Q Well No. 18, the one with the huge deliverability, has 41 feet of net pay according to your calculation?

A Yes.

Q Well No. 15 has 53 feet, it's larger by 12 feet, is that correct?

A No, it's 52 to, it would be 11 feet.

Q So the one with the thinner sand has five times the deliverability of the other, is that correct?

A On the 1961 schedule.

Q Is this the direct relationship that you are saying



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exists in the field?

A I believe that if you would look at it from the remaining reserves, which I'm not in a position or not qualified as a reservoir engineer to further discuss that, I think that you'll find there's a similarity.

Q Well, you say that the one with 52 feet has in effect 30% more reservoir than the one with 41 feet, is that correct?

A Would you care for the production figures?

Q You say that Well No. 15 with 52 feet, which is larger than Well No. 18, has a reservoir that is larger net pay by 30%, is that approximately right?

A Let me see here.

Q Whatever it is.

A It has 11 feet greater thickness.

Q How much bigger, 11 over 41?

A The thing there, you are using the one parameter trying to correlate it directly to reserve, and one parameter, thickness, is trying to exclude permeability, water saturation, and I am not qualified as an engineer.

Q We got off on the tangent, Mr. Street, because I asked you if these exhibits, even when we leave deliverability in them, are in any way a support for your testimony that deliverability is a measure of reserves.

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A Yes, sir.

Q I'm trying to find out how it is supported.

A As long as you consider all the factors or all the variable parameters that are to be considered.

Q Do these exhibits --

MR. KELEHER: Let's let the witness answer, please.

A There's only one major parameter of this Basin-Dakota Field that I have undertaken to illustrate by isopach and cross section, and that is the thickness.

Q Well, then, these series of Exhibits 2, 3 and 4 do not purport to show any of the other parameters, porosity?

A No, sir.

Q Drainage area of the particular well?

A No, sir.

Q Would you look at Well No. 3 on Exhibit 3, please? Would you state for the record the thickness of that pay sand?

A 42 feet.

Q And the deliverability of that well?

A 801.

Q That is almost the same thickness as Well No. 18, is it not, which is 41 feet?

A Yes, sir.

Q Same net pay. Is the deliverability of Well No. 18, over



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eight times larger?

A The deliverability of Well No. 3 was 801, and of 18 of 6793.

Q Well No. 18 has a deliverability over eight times larger than Well No. 3?

A It has 6793, yes.

Q Your answer is yes? A Yes.

Q With almost equal net pay? A Yes, sir.

Q Would you please refer to your Exhibit 4, which I believe would be cross section BB?

A All right.

Q I think you testified that these three wells were selected, quote "because they are offset well locations".

A Right.

Q Is that your reason for selecting these three?

A Yes, sir.

Q Are there any other three offset wells in the field?

A There could be many others, I elected to select these.

Q Is there any other reason for your selection of these three wells?

A They illustrate this rapid change in the Dakota, lateral variation of the Dakota.

Q This seemed to be a much more rapid variation than you have on cross section AA?

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A Yes; if you consider the magnitude, yes.

Q Is this representative of the reservoir?

A This is a cross section, as I said, of three offset wells which depicts the lateral variation.

Q Are they representative of any three wells in the reservoir?

A I would say they are not representative of any three because there's that much variation. That's what I am trying to illustrate, that there is the variation.

Q You have presented this to show there is great variation over a very short distance?

A Yes.

Q Four thousand feet?

A Yes.

Q Is that representative of the reservoir, is there great variation on any four thousand feet in the reservoir?

A That was so indicated.

Q Is that your testimony?

A On the AA¹, yes.

Q That there is substantial variation in net pay over a distance of four thousand feet in the reservoir?

A There may be, yes, sir.

Q There may be, as shown on this, in this instance is it your testimony that this is representative of the reservoir? Is



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there great variation between all of the wells in the reservoir, each to its neighbor?

A From that standpoint, depending on the size of the producing area, the size of the particular sand body which is under investigation on a relative basis, cross section BB¹ as compared to the cross section AA¹, obviously there are wells which will compare fairly closely in a larger sand body.

Q You mean the 21 wells?

A There are the offset wells which would be similar to this one which do have a comparable section, or more nearly comparable; however, there are none that are exact.

Q I'm trying to get just one answer with respect to this exhibit, Mr. Street.

A In speaking of --

Q Were these three wells selected because they are an extreme case and helped you make this point or are they representative of the reservoir?

A I would say they are a sampling of the reservoir.

Q Representative of what you might find in the reservoir if you selected three wells here and there?

A In that you can expect lateral variation.

Q Of the magnitude, the magnitude shown on Exhibit 4?

A It doesn't have to be the same ratio or percentage if

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you wish.

Q Well, is this the average?

A I would not call it an average.

Q Does this show more lateral variation than the average?

A Not having calculated a statistical average on variation, I could not say. However, I believe on cross section AA¹ we can see similar circumstances. If I may, I will refresh my memory, for instance, on logs 3 and 4 of AA¹, which in Well No. 3 there's a sand body of 35 feet of gross thickness and which has thinned down in Well 4 to 19 feet, and in Wells 5 and 2, which is direct offsets, it is not present at all, so I believe that we find, I don't know that there would ever be an average variation, but I believe the sharp lateral changes are rather apparent.

Q Then you do testify that there are sharp lateral variations in net pay over short distances in the reservoir?

A Yes.

Q Mr. Street, referring to your deliverability contour map, we seem to have very definite trends of areas of high deliverability, they almost look like structures, is that not the case? Doesn't this look like a little anticline of some kind?

A There's no relationship of the deliverability contours and structure.

Q I'm asking if it looks like it.

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A If it looks that way to you, fine.

Q Is there any relationship between deliverability and fracturing?

A In the natural sense or in the sense of artificial stimulation?

Q The natural recemented fractures that I understand to be quite common in the reservoir, is there any?

A Not to my knowledge.

Q When you artificially frack a well, oh, first, are there or are there not evidences of fracturing in the reservoir?

A In some of the cores it has been, fractures have been reported.

Q When you artificially fracture a well, what happens?

A It is the purpose of the fracking technique to fracture the formation.

Q Do you open up the natural fractures that are there or do you just tear the rock asunder?

A If natural fractures do exist I would assume that would be the zone of weakness; if they did not exist and you are not able to fracture, I would assume that since that is the purpose that fractures would be created.

Q You do testify that if there are no natural fractures present, by artificial fracking you can cause fractures to occur?

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A Yes, sir.

Q You are?

A Yes, sir.

Q You do testify, then, that there is no relationship between deliverability and fracturing?

A Not to my knowledge.

Q Is there any relationship between structure and fracturing?

A Not to my knowledge.

Q Just take a big solid piece of rock and bend it and it won't crack?

A That isn't the question you asked.

Q When these sands were laid down, were they laid down relatively flat?

A It is assumed so.

Q Are they still relatively flat?

A Yes, sir.

Q Are there local variations caused by natural forces?

A Perhaps so.

Q Has there been wrinkling and folding of some kind in the Basin?

A In this Basin around the outer margin there's a surface indication of structure. However, it would all depend on what structural datum you wish to explore, the structural configuration.



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There are enough variations in the sedimentation to cause sedimentational structure.

Q Throughout the Basin, in summary, has there been any folding and bending of the sand from its original condition?

A From a basinal condition, yes.

Q When these things occur, does not the rock fracture?

A Not necessarily. It depends upon the -- the forces involved.

Q In this Basin, when that folding and bending occurred, did fractures also occur?

A That I could not testify, whether they were or were not.

Q You don't know?

A No, I don't know.

MR. STOCKMAR: That's all the questions I have of this witness.

MR. PORTER: At this time we are going to recess the hearing until 9:00 o'clock tomorrow morning.

(Whereupon, the hearing was recessed until 9:00 o'clock, April 20, 1962.)

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